



# PanAfrican Agriculture

BALANCED AND AUTHORITATIVE

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## Tooling up

How drones and tractor sharing innovations are revolutionising farm mechanisation in Africa.

## Q&A

With the Director-General of Kenya's crop sector regulator, Beatrice Nyamwamu.

## Seeds of hope

FAO project helping former IDPs in South Sudan to recover their livelihoods.

**AWARD Director champions inclusion in agricultural research and innovation.**

# Dr Susan Kaaria



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# Editor's Note

## Close the gender gap in agricultural research, innovation and policy

**T**HE story of Beatrice Nyamwamu demonstrates the impact women in agriculture can make in senior public service roles.

Ms Nyamwamu, who has been in public service for 25 years, is currently the director-general of Kenya's crops sector regulator, the Agriculture and Food Authority (AFA), and previously headed its food crops directorate.

In both roles, she has steered major reforms in the sector credited with shielding farmers from exploitation, improving post-harvest handling, opening market opportunities and attracting investments in the country's key food crops value chains.

The most widely talked about product of those reforms are the regulations that restricted the packaging of Irish potatoes to 50kg bags, pulling the plug on the predatory brokers who for many years gave farmers a raw deal.

For this edition of *PanAfrican Agriculture*, we interviewed Nyamwamu and you can catch up with her giving deeper insights on the crop sector regulations and her vision for the agency in the Q&A section.

Unfortunately, most public and private sector organisations in Africa are missing the unique perspectives that women leaders like Beatrice bring to agricultural policy, research and innovation due to persistent barriers against women rising to leadership positions.

African Women in Agricultural Research and Development (AWARD) says that women constitute less than a quarter (24 percent) of agricultural researchers in sub-Saharan Africa and only seven percent of these are in leadership positions.

Dr Susan Kaaria, the Director of AWARD and a globally renowned champion of inclusion in agricultural policy, research and innovation, explains in our profile feature how the organisation's career development programmes are helping level the playing field.

Our special reports package for this edition focuses on farming mechanisation, a key issue often linked to the low food production and low agricultural productivity on Africa's smallholder farms.

The continued use of the hand hoe to till land in some places symbolises the persistent drudgery.

But as our writers across the continent found out, innovations around equipment access and costs are breaking new ground in farm mechanisation.

Read about the tractor sharing apps linking tractor owners with farmers in Kenya and the drones dropping off semen to pig farmers in Cameroon, for example.

Enjoy!

*Cianki*



Photo Credit: John Deere

## 22. Levelling the playing field in agricultural research, innovation

Dr Susan Kaaria, the Director of African Women in Agricultural Research and Development (AWARD), speaks about the slow pace of change and the continued existence of barriers that make it difficult for women to contribute more meaningfully to agriculture -- including taking up leadership roles, conducting scientific research, generating innovations, making key decisions, and influencing policy.



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*Agricultural scientists from Uganda display the industrial products they are processing at the Food Biosciences and Agro Business Research Center at Kawanda in Uganda. Photo Credit: Lominda Afedraru*

# Uganda going bananas for ethanol, hair braids

By Lominda Afedraru

**T**HE banana is widely popular for its food value, including fruits, cooked dishes or flour in confectionery industries.

In Uganda where more than 75 percent of farmers grow the crop, Matoke, cooked from green banana, is the staple food.

Scientists in Uganda and other countries in East Africa have therefore been breeding banana mainly to improve its fruit yields.

But now they are looking into ways of obtaining industrial products such as ethanol and fibre for processing hair braids from banana stems as well.

At Uganda's National Agricultural Research Laboratories (NaRL), reputed for its banana research, they are adding value to the East African highland banana by processing bioethanol products, hair braids, banana lint as well as banana starch for pharmaceutical industries from banana stems.

## **Ethanol production**

Yusufu Mukasa, a food chemist at the Food Processing Technology and Incubation Centre at NaRL in Kawanda, said his team of scientists have been working with farmers over a period of two years on a project to process ethanol from banana stems.

Most farmers in the country's banana-growing Central and Western regions grow East African Highland banana varieties namely Naroban

6H and 7H, M9, Nakitembe and Nakabululu.

Mukasa said they are trying out a number of scientific processes, including those used in countries such as India and others in South Eastern Asia where a lot of banana is grown.

They obtain the feedstock – uprooted banana stems -- used in ethanol production from the local farms.

These are then transported to the production facility at NaRL where they are washed and classified.

"It is then crushed into pieces, left to dry and mixed with sorghum or millet in drums where it is left to ferment for a period of 6-24 hours depending on the brewing system.

Thereafter ethanol is extracted and packaged for industrial use,” Mukasa said.

The scientists have gone ahead to refine the ethanol for hand washing for prevention of Covid-19 and conducted demonstrations with farmers in Kasese District to explore its potential use in alcohol production.

They also intend to work with brewery industries to produce ethanol in large volumes for commercialisation.

### **Starch extraction**

Apart from processing ethanol, Mukasa and team are also extracting banana starch from banana fingers for industrial use.

The process involves peeling, washing, crushing and drying the banana fingers in the oven under a regulated temperature to obtain the banana powder.

The required volume of banana powder is mixed with water and a solution of sodium bisulfite ion, a food preservative.

The liquid suspension of the resulting mixture is then centrifuged to separate the crushed banana finger material and the white banana starch will settle at the bottom.

Mukasa said the main target is to use the starch for blending pharmaceutical products produced within the country.

### **Hair braids**

Dr Jimmy Tindamanyire, a laboratory manager at NaRL, said that scientists at the institute have been working with the private sector players involved in processing braids for hair plaiting from way back in 2020.

This is after realising synthetic fibres have their own challenges yet braid processed from banana fibre is soft.

There are already existing industries in Kampala where these banana



*A scientist displays banana starch processed from the banana plant.  
Photo Credit: Lominda Afedraru*

braids are processed, packaged and sold in a number of marketing outlets.

### **Banana lint**

Another product which the scientists have begun working on is processing banana fibre and refining it into lint for processing clothes.

This research is still at the laboratory level and already scientists have achieved the white colour they expect just like the colour for cotton lint.

### **Incubation**

Elizabeth Kakhasa, a food scientist at NaRL, said the institute has the potential to develop even more innovations, citing its status as the centre for banana breeding not only in Uganda but the entire East Africa.

The necessary food processing machines have been installed at the institute's Food Processing Technology and Incubation Centre.

The centre has brought on board a number of young entrepreneurs interested in food processing.

Once they acquire the required knowledge, they are expected to start their own food processing companies.



*(L-R) Prof Ratemo Michieka -Chair of the National Research Fund, Prof Varsey Mwanje - Crop Protection Specialist and Dr Margaret Karembu, Director ISAAA Africenter during a media science cafe in Nairobi.*  
Photo Credit: ISAAA Africenter

# Forging a common front against zoonotic diseases

By Murimi Gitari

**I**N less than three years, the World Health Organisation (WHO) has announced two public health emergencies of international concern, Covid-19 and monkeypox, both linked to pathogens transmitted from animals to humans.

Experts are warning that new pathogens jumping between animals and humans will become more frequent as habitats change in a warming world.

The animal-human diseases, technically known as zoonotic diseases, cost many countries millions of dollars every year spent in response and control efforts.

Increased movement of people, exchange of goods and foods within and across borders coupled with environmental degradation have seen diseases previously confined to a limited population spreading widely as people and animals seek favourable surroundings.

Dr Mathew Mutiiria, a medical epidemiologist in Kenya's Ministry of Health, says such diseases can be best controlled through the 'One Health' approach – a concept that recognizes the fact that human and animal health is interdependent and bound to the health of the ecosystems in which they exist.

Dr Mutiiria says the 'One Health' approach to disease control involves the participation of experts in human, animal, environmental health, and other relevant disciplines and sectors in monitoring and controlling public health threats and to learn about how diseases spread among people, animals, plants, and the environment.

The WHO also encourages collaboration across sectors and disciplines to protect health, address health challenges such as the emergence of infectious diseases and antimicrobial resistance.

Two million people in low- and middle-income countries die each year from neglected endemic zoonotic diseases such as anthrax, bovine tuberculosis and rabies every year.

In Kenya, for instance, recurrent outbreaks of Rift Valley fever (RFV) and anthrax have caused significant losses of threatened rare and endangered wildlife species.

These include the white and black rhinoceros, Rothschild giraffe, elands, Thompson gazelles, waterbucks and Grevy's zebras.

"Kenya is at high risk from zoonosis and other trans-boundary diseases due to her geographical location, growing human population, close livestock-wildlife-human interactions and porous borders," Dr Mutiiria said during a recent media science café organised by the Open Forum on Agricultural Biotechnology in Africa (OFAB) in Nairobi.

Kenya's Ministry of Health estimates that about 2,000 rabies-related human deaths occur in the country annually and the number could be higher due to inadequacies in the current surveillance system. The average cost of post-exposure treatment for rabies in Kenya is Sh9,000 per patient and is higher when the psychological trauma and the financial hardships are fully accounted for, according to the medical epidemiologist.

In July, Tanzania's Minister for Health confirmed that more than 20 cases of a mysterious illness that resulted in three deaths in the country were linked to leptospirosis – a bacterial disease spread mostly by coming into contact with the urine of an infected animal, or water, soil, or food.

OFAB chairperson Margaret Karembu said keeping people and animals healthy is one way of controlling zoonotic diseases.

"We all need to be healthy, our environment and animals need to be healthy. We've seen a lot of interactions in the environment and so we're experiencing diseases from animals and humans. All these impacts on the health of human beings, health of the environment and all ecosystems," said Dr Karembu.



**A section of the journalists who attended the media science café organised by ISAAA Africenter. Photo Credit: ISAAA Africenter**

By linking humans, animals and the environment, the 'One Health' approach can help to address the full spectrum of disease control – from prevention to detection, preparedness, response and management, and contribute to global health security.

The approach can also make it easier for people to better understand the co-benefits, risks, trade-offs and opportunities to advance equitable and holistic solutions.

In Kenya, the government developed the One Health Strategic Plan for the Prevention and Control of Zoonotic Diseases in Kenya (2021-25), which is implemented by the Zoonotic Disease Unit domiciled at the ministries of Health and Agriculture. The strategic plan shows that brucellosis, bovine tuberculosis and non-typhoidal salmonella alone cost the country more than Sh600 billion annually, corresponding to 3.9 per cent of the national GDP.

The Zoonotic Diseases Unit has managed to strengthen surveillance across the country to slow down these diseases and prevent major outbreaks.

Zoonotic pathogens can spread to humans through direct contact

or through food, water or the environment.

Public health experts link the recent outbreaks of zoonotic diseases such as Ebola, bird flu, Middle East Respiratory Syndrome (MERS) and Zika virus, to humans encroaching on wild spaces.

The International Livestock Research Institute (ILRI) recently held a conference to discuss the One Health approach and how to support and implement it.

Dr Hung Nguyen, the co-leader of Animal and Human Health Program at ILRI, said the recommendations from the conference will guide policy makers, government officials and other stakeholders on how to implement the One Health approach.

Dr Mutiiria also notes the implementation of the approach in Kenya is faced with challenges, including limited financial resources and data.

Other challenges experienced in the country are limited expertise in the environmental sector and bureaucratic processes.



*Staff at work at the Hagana plant that is processing raw honey into refined products that meet international market standards.  
Photo Credit: Panagri Media Reporter*

# South Sudan honey processor sweetens the deal for beekeepers

By Panagri Media Correspondent

**T**UCKED away in the outskirts of South Sudan's capital Juba in Jebel, the machine at a small processing plant spins on, turning raw honey into a refined product that meets the quality standards on the international market.

Emmanuel Zamoi is one of the beekeepers who have found the processing plant operated by Hagana Agro-processing Co. Ltd useful in boosting their income.

"Getting the market for honey was a big problem for us since there were no buyers," the 46-year-old said on the phone from his home in Western Equatoria's County of Maridi.

**Zamoi owns an apiary with about 100 beehives.**

"I did not know I would sell my honey with all the combs for about 500 South Sudanese pounds (SSP). But now we are sure of a ready market, and prices are stable at around 800 SSP," he said.

Honey is a natural alternative to refined sugar and an immune booster and builder.

South Sudan's potential in production and export of honey could rival Africa's biggest producer, neighbouring Ethiopia.

Matata Safi, the chief executive of Hagana Agro-processing, said South Sudan has a conducive environment for honey production owing to its vast forest reserves, swamps and savanna which provide a home for bees to thrive and make honey.

Areas suitable for honey production include the Bahr el Ghazal, Lakes, Western Equatoria, Eastern Equatoria, Upper Nile and Unity states.

But the traditional methods of beekeeping employed and massive displacement of communities due to insecurity have left the sector struggling.

Hagana Agro-processing is working with 617 beekeepers, mainly from the Western Equatoria State, to ensure value addition through processing and packaging of honey.

Safid said honey is "becoming a key commodity in the world market as people move away from refined sugar".

The plan, according to Safi, is to ensure honey from South Sudan fetches much more for its farmers. "If you can do value addition, you will be able to get more money," he said.

Six years of conflict in South Sudan left 400,000 people dead, displaced four million others and slashed the production of crude oil, the country's main revenue source and led to an economic crisis.

Agriculture bore the heaviest brunt as communities traded their farmlands and production for security in internally displaced people's camps or as refugees across the border.

Relative peace that followed the implementation of a 2018 peace agreement has opened doors for communities to rebuild their livelihoods, including resuming farming.

However, faced with floods, the Covid-19 effects and global commodity crises, the country is still struggling with food security. The United Nations and partners project 7.74 million people in South Sudan are currently food insecure.

Several enterprises are investing in agro-processing to increase food production, get better prices in the market and reduce post-harvest losses.

Companies are venturing in production of soft drinks from fruits, beer from sorghum and cooking oil from simsim and groundnuts among others.

### Export breakthrough

Despite starting operations only five years ago, the products of

“We are not only producing honey to be consumed locally. For you to have your honey placed in a store in Japan or in any international market you have to meet standards and for you to meet standards, you



**Matata Safi, the Chief Executive Officer of Hagana Agro-processing Co. Ltd in his office. Photo Credit: Panagri Media Reporter**

have to meet quality from production up to processing and packaging,” Safi said.

“We are enlightening our farmers to know that honey can be one of the drivers of economic growth in South Sudan.”

With small companies embracing value addition in local production, agriculture products will garner more money in the industry, he said.

“What we need is a holistic environment where all these small companies are doing value addition, creating lots of jobs for our youth and our women and contributing to economic development,” Safi said.

Local consumers are increasingly buying the locally processed honey with shops and supermarkets demanding more of the local product.

“This is because the whole value chain is monitored, our farmers are trained and give us quality honey,” Safi said.

“Today we have become a brand name in South Sudan and if you go to any shop or supermarket, people say ‘this is the quality we know’.”

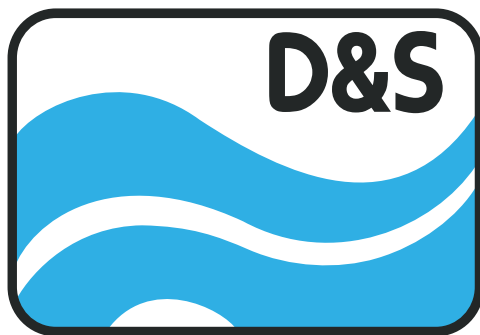


**Hagana products on display ready for sale. Photo Credit: Panagri Media Reporter**

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*Janvière Tuyisenge, a researcher from Rwanda whose work is examining the implications of cage aquaculture for the limnology and health of Lake Kivu in Rwanda.*

*Photo Credit: Lydia Atieno*

# Cage fish farming tests the health of Rwanda lake

By Lydia Atieno

**D**URING her early childhood and education, Janvière Tuyisenge says society made them believe the stereotype that science was not a subject for girls.

She went through school afraid of making a 'wrong career choice' in a science-related field.

When she started her secondary education, however, her parents motivated her to venture into science.

"Science was not my preferred subject but I followed my parents' advice and chose to study biology and chemistry even up to university level, chemistry being my best subject," says Tuyisenge, who is currently studying for her PhD in aquatic ecosystems at IHE Delft Institute for Water Education, the Netherlands.

"Nature is beautiful and we humans highly depend on the ecosystem services from aquatic ecosystems. We use water bodies for recreation, transport, and fishing.

Currently, macro-projects including aquaculture grow on these important ecosystems."

Her research is examining the implications of cage aquaculture for the limnology and health of Lake Kivu, in Rwanda.

Cage aquaculture technology, popularly called '*Kareremba*', involves stocking and feeding fish, mainly tilapia, in floating cages of various sizes until they are ready for harvesting.



Tuyisenge during one of her research in Lake Kivu. Photo Credit: Lydia Atieno

It employs an estimated 200,000 people on the Rwandese side of the 2,700 square-metre lake shared with the Democratic Republic of Congo and is being promoted as part of the government's strategy to commercialise fishing, improve livelihoods and alleviate poverty.

But it has also raised concerns about the environmental effects on the lake, especially pollution from the discharge of inorganic and organic nutrients.

Tuyisenge hopes that her research findings will contribute to efforts to ensure ecological sustainability of cage aquaculture on Lake Kivu, even as the government seeks to promote the adoption of the technology in ponds and other lakes in a bid to improve food security.

According to the country's fisheries and fish farming Master Plan, a total of 1,063,000 tons of fish can be generated annually from the aquaculture sector alone.

The government notes that while intensive fish farming requires higher investment, it has a greater potential to increase aquaculture production, with a target of more than 55 percent contribution to fish production.

According to Solange Uwituze, the Deputy Director General in charge of Animal Resources Research and Technology Transfer

at Rwanda Agriculture Board (RAB), the country's fish production by 2021 was 39,269 tonnes of which 87 percent was from fish capture and only 13 percent came from fish farming.

Illegal fishing practices, low investment, expensive fish feeds and lack of value addition have been cited among the major contributors to low production.

Rwanda's demand for fish is estimated to reach 112,000 tons by 2024.

Producing 112,000 tons by 2024 per year could help Rwanda attain the average sub-Saharan per capita consumption of 6.6 kilograms of fish per person per annum and 265,600 metric tons to reach the global average of 16.6 kilos.

In order to increase fish production, Uwituze says that Rwanda seeks to invest Rwf240.8 million in 2022/2023 fiscal year and Rwf283.7 million in 2023/2024 fiscal year in restocking lakes and ponds as well as Rwf85.1 million in the training of cooperatives on production technologies.

She adds that Rwf4 billion and Rwf4.7 billion are planned to be invested in subsidizing fish feed production in 2022/23 and 2023/24 fiscal years respectively.

“

**Illegal fishing practices, low investment, expensive fish feeds, and lack of value addition have been cited among the major contributors to low production.**

”



*Farmers being trained on when and how to apply farming inputs. Photo Credit: Elias Egalame*

# Inside Cameroon farmers' seed bank

By Elias Ngalame

**S** EED multiplication farms are helping farmers in the southwest region of Cameroon fight the effects of climate change and poverty.

The farms have been set up under a government programme to improve the availability of quality seeds or planting materials for maize, cassava, beans, yams and plantains and make them easily accessible by needy farmers.

The programme is being implemented by the Southwest Development Authority (SOWEDA) in Buea, Ekona, Barombi Kang, Kumba and other areas.

"For agriculture to be successful, it starts with quality planting material," says Christopher Ekungwe, regional delegate of agriculture for the Southwest.

He says in the past some farmers used seeds from their previous harvest, but such seeds lost some

vital characteristics having been affected by prolonged drought and did not produce as much as the improved ones offered by SOWEDA.

The expansion of the project to all the six divisions in the region is also attracting many farmers from other parts of the country.

"We are happy the seed multiplication farms are expanding as many more farmers from other parts of the country are attracted to the high yield seeds," says Ekungwe.

Farmers attest the project has reduced their worries over plummeting yields linked to climate change and significantly improved their production, incomes and capacity to employ more youth.

"We now get the regular supply of quality and adapted seeds at affordable prices thanks to the seed multiplication farms," says Divine Nkeng, a 33-year-old farmer in Buea.

"With quality seeds guaranteeing high yields as well as a free training programme, many more youth are now attracted to farming."

Experts say the seed sector has immense potential to create employment for many young people in sub-Saharan Africa and reduce poverty through increased production and income to the farmers.

Adolph Njokwe, a maize farmer in Muyuka in the Southwest region, says in the past two years he has produced more than twice what he harvested before thanks to the quality seeds from the multiplication farms.

He harvested eight tonnes of maize in 2021 up from 3.5 tonnes in 2019 from his four acres farm. He blames the poor yields in the past on prolonged drought that affected seeds from the previous harvest.

Like Njokwe, many other smallholder farmers in the region say they suffered from the effects of intensified drought in recent years, including unpredictable rainfall.

Crop failures or low yields led to food shortages, a situation that was not helped by the fact the cost of seeds was considerably high.

"In the past, accessing seeds has been a major hurdle. Sometimes we could get quality seeds from agriculture research centres but at prices three times higher than what we get now from the seed multiplication farms," says Julius Takem, a cassava farmer in Buea.

Dr Andrew Eneme Ngome, the SOWEDA chief, says the programme is part of the government's efforts to ensure food security.

"Seed security is food security, that is why we provide not only planting materials but also insecticides to farmers in the region early enough at affordable prices ahead of every planting season to prevent them from resorting to low-quality substitutes at exorbitant prices elsewhere," says Dr. Ngome.

SOWEDA officials say the programme also serves as a community seed bank to enhance the resilience of farmers by securing and facilitating access to diverse, locally adapted crops and varieties.

"Availability of diverse improved seeds to needy farmers is like putting money in the bank in readiness for a rainy day," says Peter Epie Ngalle, the SOWEDA Director of Monitoring and Evaluation.

"Agriculture is the driving force of Cameroon's economy, so empowering farmers with right inputs is guaranteeing the country of sufficient food supply."

More than 70,000 tons of maize seeds, 20,000 tons of bean seeds, and 15,000 yam seeds from the multiplication farms are distributed to farmers in the region every year on request. The quantity, however, increases when more groups are registered.

Each farmer's common initiative group pay just a token of 50,000 FCFA (USD 90) to get these set of disease-resistant seeds, the officials say.

So far, 63 farmer groups have benefited from the programme, receiving farm inputs worth over 25 million FCFA for free every year.

The farm inputs per farming group include 110 litres of liquid fertilisers, 500 litres of herbicides, 375 litres of insecticides and 600kg of foundation maize seeds. The farmer groups are drawn from all the six divisions of the Southwest. The farmers undergo a selection process supervised by the regional delegation of Agriculture and Rural Development.

The farmers are also trained on when and how to apply for the different inputs to enhance soil fertility for increased productivity.

"We also benefit from training on how and when to plant and make judicious use of the inputs we receive," says Itoe Hansel, Head of Muyuka Farmers' Platform.

SOWEDA officials say they look forward to increasing their supplies of improved seedlings to as many farmer groups in the country as possible to improve on government's efforts towards food security.

According to a July 2017 World Food Program report, Cameroon has witnessed escalating food shortage and child malnutrition, especially in the northern regions in recent years.

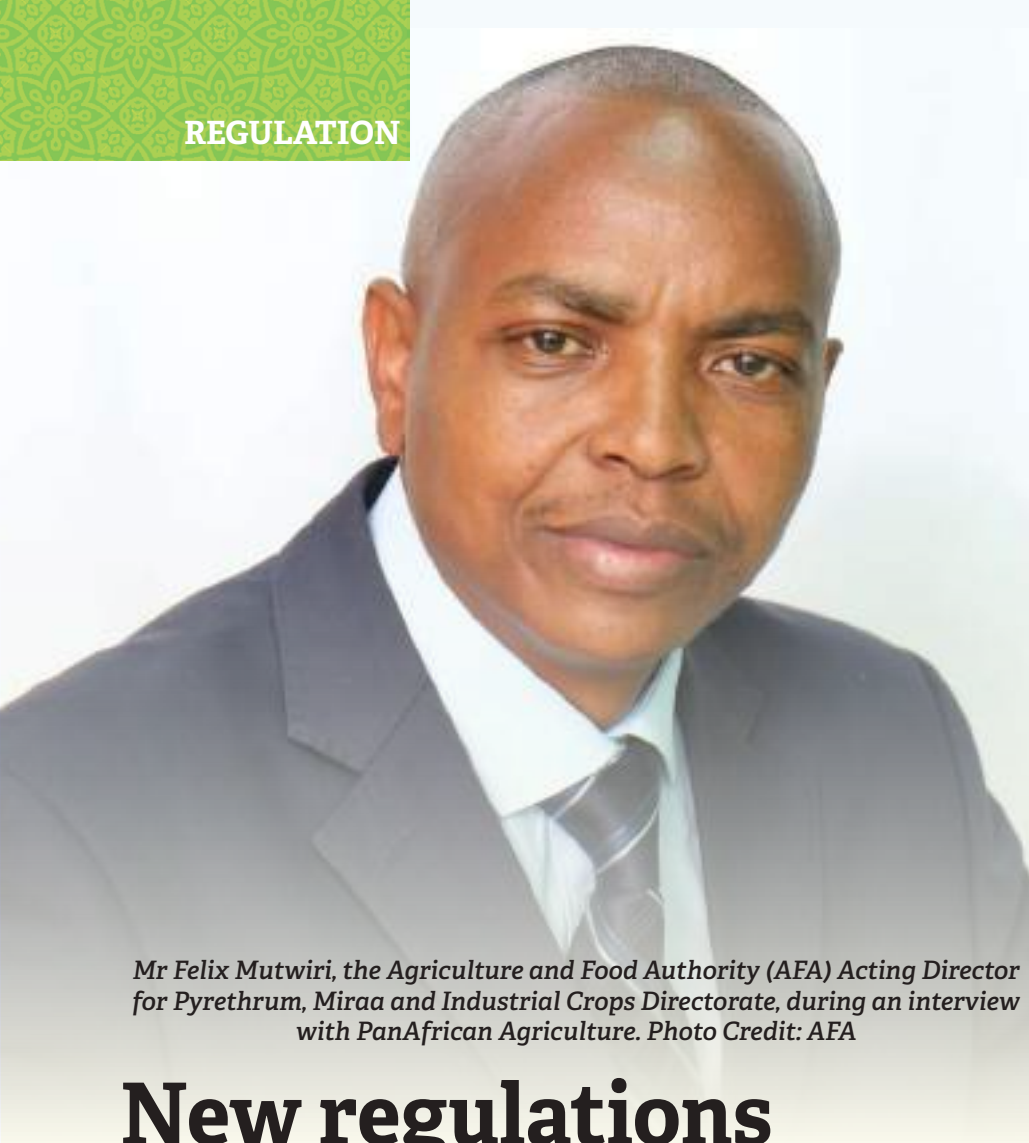
In two decades, Cameroon has gone from being largely self-sufficient to a large-scale importer of basic foodstuffs, according to estimates by the Association Citoyenne de Défense des Intérêts Collectifs (ACDIC), Cameroon's largest farmer organisation.

ACDIC officials say supporting farmers with improved seeds at the beginning of every planting season is the way forward in efforts to restore the country's food security pride.

"When farmers have the right material for greater yields, the results are always positive," says Benard Njonga, the chief executive of ACDIC.



*In Cameroon, small producers, including women, will have access to agricultural inputs thanks to the Bank Group's emergency food program. Photo Credit: AfDB*



*Mr Felix Mutwiri, the Agriculture and Food Authority (AFA) Acting Director for Pyrethrum, Miraa and Industrial Crops Directorate, during an interview with PanAfrican Agriculture. Photo Credit: AFA*

# New regulations to stimulate khat growing, trade

By Murimi Gitari

**K**ENYA has introduced new regulations governing the production and trade in khat, the stimulant popularly known locally as miraa.

The regulations published in June require miraa farmers and traders to comply with high quality and safety standards (KNWA 2940:2021) in the production, processing and packaging of the produce to make the produce competitive in the local and export markets.

The rules also seek to shield farmers from exploitation by brokers or middlemen by organizing themselves

as formal business entities and bring order to a sector that has gained notoriety for the dangerous driving of its transportation trucks.

“The Crops (Miraa) (Amendments) Regulations, 2022 are going to improve and address various gaps that currently exist in the miraa value chain. They will demonstrate the procedures and conditions for people to deal with the miraa crop as well as guide on the issues of compliance with standards, quality and safety of miraa for the export market,” Mr Felix Mutwiri, the Agriculture and Food Authority (AFA) Acting Director for Pyrethrum,

Miraa and Industrial Crops Directorate, told PanAfrican Agriculture in an interview.

“We will no longer have ‘flying cars’ from Meru, Embu and Tharaka Nithi counties transporting the product to Nairobi, Mombasa or other major destinations. Farmers and even traders will embrace modern technology as we explore to have cold storage sheds at the collection centers as well as have refrigerated or aerated vehicles that will be transporting the miraa crop.”

The new regulations are also expected to facilitate trade by having farmers, traders and associations register and licensed to improve collection and maintenance of data related to the sector.

“The aspect of compliance and enforcement of standards will also come into place for the assurance of products. This will be a value proposition as miraa will now be able to meet the requirements of the European retailer's protocol on good agricultural practices,” Mr Mutwiri said.

The stimulant, grown as a major cash crop in Kenya's Eastern region, is largely exported to Somalia after European countries classified it as a drug and banned its use.

Kenya's miraa exports to Somalia resumed under the new regulations in August after three years following a diplomatic row between the two countries.

The regulations earlier had imposed a levy on miraa exports, whose non-payment to AFA attracted heavy penalties. However, following concerns raised by some industry players regarding the miraa levies the Cabinet Secretary Ministry of Agriculture, Livestock, Fisheries and Cooperatives amended the regulations by deleting regulation 29.

Regulation 29 required there shall be miraa levy on export and imported miraa and miraa products and levy charged shall be at a rate of Ksh.30 per kilogram of miraa and miraa products for export and Ksh. 60 per kilogram of miraa and miraa products imported.

Any levy imposed under this regulation which remained unpaid was to be recovered by the Authority as a civil debt due to it from the person by whom it is payable.

"A person who failed, neglected or otherwise refused to pay or remit the regulatory levy - as provided for under the regulations where directed by the Authority in writing, in addition to paying the regulatory levy shall have a sum equal to five per cent of the amount added to the amount due for each month or part thereof during which the amount due remains unpaid," said the regulations.

In light of the above, the only fees charged currently in miraa trade is for the export permit which is administered at Ksh.4,000 per consignment.

Mr Mutwiri said the drafting of the regulations involved consultations with stakeholders in the miraa value chain.

"This whole process involved stakeholders in the miraa value chain by visiting the counties where the crop is grown for public participation as well as traders. So that there was ownership and input from interested parties," he said.

Some aspects of the new rules, including the levy, had not gone down well with traders.

Nyambene Miraa Traders Association chairman Kimathi Munjuri has said the association had welcomed the publication of the regulations, saying they will address malpractices among traders and aggregators and help streamline the khat business in the country.

However, he had concerns about the new levies saying the amounts were higher than what was agreed during the stakeholder validation meeting.

"When the development of these regulations was being done, a stakeholders validation meeting was held for public participation and as stakeholders we agreed on a certain and specific amount to be paid as levy and for licence but what we had seen



**Jacob Manyara (left), a miraa vendor in Eastleigh with his colleague packaging a roll of khat for sale. Photo Credit: Murimi Gitari**

on the published document was quite different," Mr Kimathi said.

The regulations had required traders to part with Sh30 for every kilogramme of miraa exported as levy and Sh20, 000 for a licence.

The new regulations had also been met by opposition from the local authorities, with the former Meru County Governor Kiraitu Murungi threatening a legal suit to have the levy and the licence fees revoked.

The levies, he said, were out of reach for many traders.

"Agriculture is a devolved function and there is no way we can be subject to regulations that were made without our input. They are illegal, unconstitutional, null and void," Mr Murungi said at the height of the election campaigns.

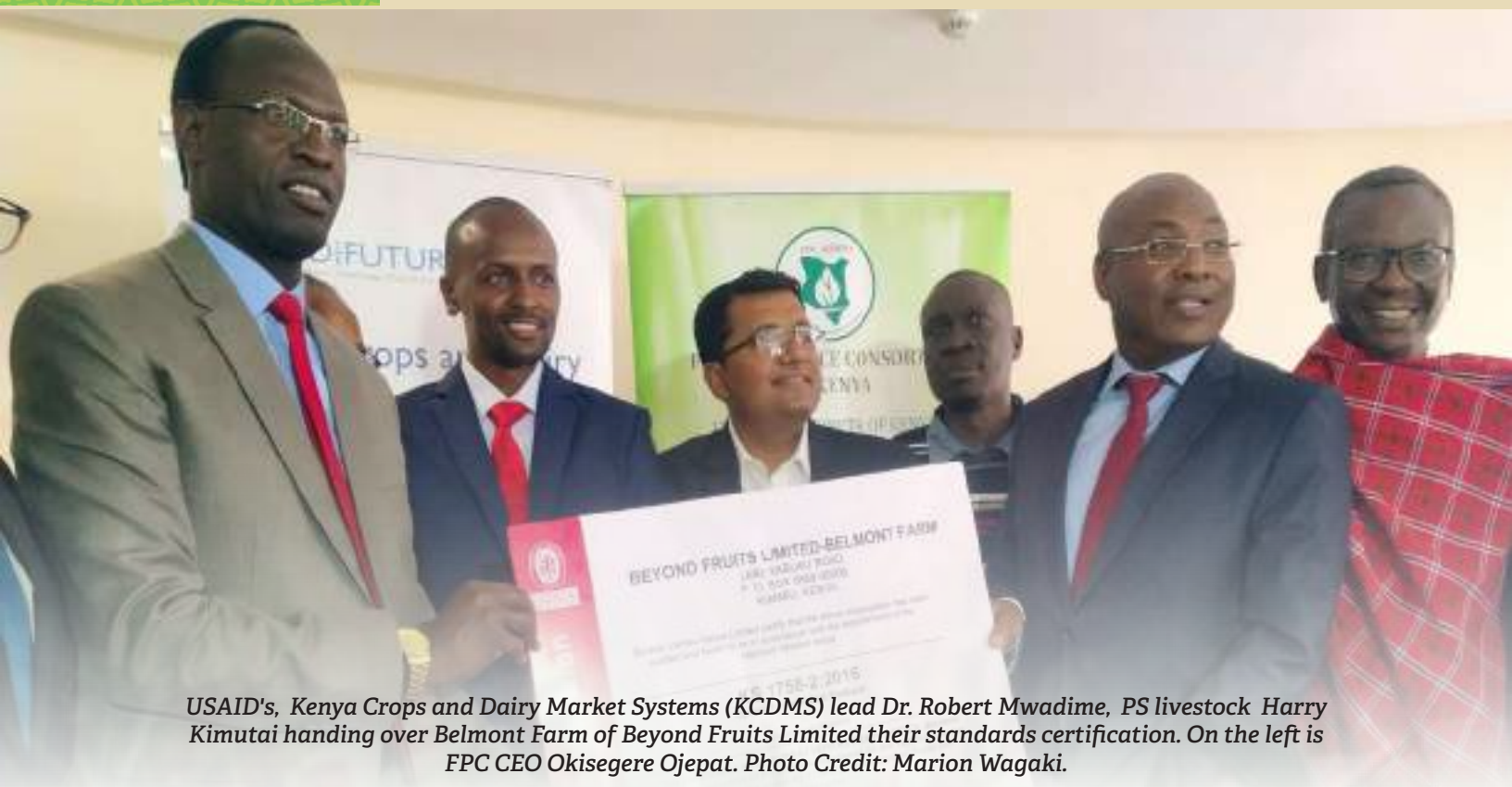
Jacob Manyara, a miraa vendor in Nairobi, said the new regulations had not sufficiently addressed the concerns of local market players.

"The government has done very little for miraa vendors. We have seen the both the national and county governments build markets for other vendors selling mangoes, vegetables and cereals but if you go

to any part of the country, you won't find even a shade or market built for miraa vendors," said Mr Manyara, who has been a miraa vendor in Nairobi's Eastleigh area for over 20 years.

The growth and development of any industry is determined by market forces. In Kenya Miraa producers have traditionally targeted domestic markets in major towns and export markets. Europe was the second largest market for miraa after Somalia prior to the ban in Netherlands in 2012 and United Kingdom in 2014. The major export markets before the ban were; United States of America, Canada, the United Kingdom, Germany, the Netherlands, Switzerland, Norway, Sweden and Denmark. The decision by Britain to ban the export of the plant in 2014 led to the loss of incomes in the growing regions considering that Kenya fetched an estimated £12.7 million from the sale of miraa to the UK in 2010.

According to AFA, closure of the miraa markets has been contributed largely due to the perception of Miraa as a drug of abuse, association of the commodity with the international control of cathine and cathinone under the UN Convention on Psychotropic Substances (1971). There is also increased negative publicity from the civil society which enhances market barriers as well as competition from other producing Countries and the lack of organized production, handling, food safety and traceability standards.



USAID's, Kenya Crops and Dairy Market Systems (KCDMS) lead Dr. Robert Mwadime, PS livestock Harry Kimutai handing over Belmont Farm of Beyond Fruits Limited their standards certification. On the left is FPC CEO Okisegere Ojepat. Photo Credit: Marion Wagaki.

# Kenya sets higher quality standards for fruits, vegetables

By Marion Wagaki

**K**ENYA has taken its food quality regulation a notch higher with the introduction of a certification standard that requires safety and traceability for horticultural produce consumed locally.

The KS1758 standard, launched by the Ministry of Agriculture in July, stipulates the hygienic and safety requirements during the production, handling and marketing of fruits, vegetables, herbs and spices.

"The KS1758 is a very important mark developed to ensure our produce meets local and international

standards and I want to urge farmers to partner with other offtakers so that they are able to produce their food in accordance and this will not only see them fetch better price for their produce but lead to better income for returns and investment," said State Department of Livestock Principal Secretary (PS) Harry Kimutai.

"We want all our food in terms of produce be safe from farm to fork, thus handled safely until it reaches the tables of the consumers and this is how critical the government policy and legal frameworks have been produced to support the private sector as they engage farmers to apply the mark of KS1758."

The standard applies to all operators in the horticulture value chain including breeders, producers, traders, shippers, and cargo handlers for local, regional and international markets.

Fresh Produce Consortium of Kenya (FPC Kenya) has been facilitating local producers to obtain the KS1758 certification and appealing to stores to stock certified products and consumers to demand certified products with the KS1758 mark.

Certification, says the fresh producers lobby, is expected to trigger higher demand for fresh produce in the city suburbs as well as growing urban centres.

"We expect high demand for food especially in the upmarket areas as food companies seek compliance with safety standards. The trend is equally being dictated by the changing food styles following emergence of chronic diseases," said FPC Kenya Chief Executive Officer Okisegere Ojepat.

Local consumption of fresh produce currently stands at 96 percent against four percent exports, mainly to the European Union and other developed markets.

"We expect that exports are going to increase to 12 percent from four percent and this will in turn increase revenue as international markets get more products from us due to compliance in the domestic market," Ojepat said.

In addition to producers, FPC Kenya is also targeting compliance by organised groceries, hotels and big traders' markets like Kongowea in Mombasa, which receives food from other counties.

Belmont Farm of Beyond Fruits Limited in July became the first producer to be KS1758 certified in the country after successfully implementing the safety measures from farm to fork.

Beyond Fruits was supported by a five year USAID's Kenya Crops and Dairy Market System Activity (KCDMS) through FPC Kenya to implement the KS1758 standard on its 12-acre farm (Belmont Farm) in Limuru as well as its farm to market logistics.

USAID, Kenya Crops and Dairy Market Systems (KCDMS) Lead Dr Robert Mwadime said it was necessary to address food safety issues considering the prevalence and increase of diseases such as cancer and others that relate to either food poisoning and food safety.

"It should be of great concern what we are feeding our people and what we choose to eat. As USAID we are going to increasingly get involved and invest in ensuring that what we eat is safe," said Dr Mwadime.

Speaking during the issuance of the certificate to the company, Mr Kimutai challenged other horticulture industry players to comply.

"Belmont Farm took the risk to support farmers to produce crops in a way that is acceptable and this is the way to go. We need others to emulate them and ensure that we have suppliers producing in accordance and as a country we will be proud to say we are producing safe food," the PS noted.

Ali Noor, the sales and marketing manager, Eastern Africa for the testing, inspection and certification firm Bureau Veritas, said that produce supplied and managed by the Beyond Fruits Limited-Belmont Farm can now be sold in any local outlet or retail store with confidence that tenets of food safety and traceability are embraced by the farmers from farm to fork.

Mr Noor noted that as farmers become more and more exposed to requirements from multisectoral stakeholders, the three triplets of food security, food safety and sustainability are always a permanent fixture in the current business environment.

"This is the beginning of a journey that has no end. Stakeholders will expect more in terms of food security, food safety and sustainability when engaging," he said.



Tomatoes at one of the fruit outlets, that has been certified and have the standard mark of Ks1758. Photo Credit: Marion Wagaki.

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*Dr Susan Kaaria, the Director of the African Women in Agricultural Research and Development (AWARD). Photo Credit AWARD*

# Levelling the playing field in agricultural research, innovation

By Kawira Cianki and Jack Otieno

**T**HE narrative around gender inequality in Africa's agriculture has changed significantly since the 1980s when Susan Kaaria went around on a bicycle advising farmers in Kenya's Meru County on the benefits of adopting better farming practices.

It was common for people then, for example, to refer to a farmer as a 'he' in conversations or meetings, entrenching the notion that farming was a man's job.

"Sometimes if you look at the statistics you would think nothing has changed, but a lot has changed. Now you do that [refer to a farmer as a 'he'] and people will frown upon that. There is also increased awareness that [government] policies and programmes such as those on tools, technology and innovations pay attention to the needs and priorities of women. We are not there yet but we have made strides," says Dr Kaaria, an international development specialist who started her career as an agricultural field extension officer.

But Dr Kaaria, currently the Director of African Women in Agricultural Research and Development (AWARD), is frustrated at the slow pace of change and the continued existence of barriers that make it difficult for women to contribute more meaningfully to agriculture -- including taking up leadership roles, conducting scientific research, generating innovations, making key decisions, and influencing policy.

Women agricultural researchers, for example, constitute less than a quarter (24 percent) of researchers in sub-Saharan Africa and only seven percent of these are in leadership positions.

Experts say the underrepresentation of women in research means that their unique perspectives on issues such as nutrition, access to inputs and to markets are often overlooked in policies and innovations.

Studies by the Food and Agriculture Organisation of the United Nations (FAO) have linked giving women access to productive resources like land and farm inputs to increased agricultural productivity.

In her past role as a Programme Officer at Ford Foundation Office for Eastern Africa, Dr Kaaria witnessed the immense impact of grants for programmes aiming to improve rural women's livelihoods.

"Working at Ford Foundation gave me the opportunity to fund innovative ideas and support microfinance institutions to develop financial products friendly to women. For dairy farmers, for example, it was crucial to have insurance for every cow. You would be amazed at how much the women were able to achieve with just a small loan," she recalls.

As part of efforts to level the playing field, AWARD is helping women to advance careers and become leaders and champions of inclusion in agricultural research and development through its Fellowships which offer tailored training to enhance leadership skills and foster mentoring partnerships to catalyse intergenerational learning.

AWARD also works with research institutions to ensure they integrate gender and inclusion in their policies, programmes and innovations.

"We invest in African scientists and research institutions so that they can deliver agricultural innovations that better respond to the needs and priorities of a

diversity of women and men across Africa's agricultural value chains. Our fellowships are tailored to enhance leadership capacities of African researchers, foster intergenerational learning and continental collaborations, ensuring that our research systems benefit from the wealth knowledge and talent available on the continent and beyond," says Dr Kaaria.

"Before they can be effective agricultural research leaders, African researchers must first be scientists of uncompromising quality. As such, strengthening the scientific research skills of the fellows is a critical component of our fellowships.

The fellowships equip the women researchers with leadership skills, negotiation skills, scientific writing, publishing skills and mentoring skills."

Since 2008, AWARD's training programmes have benefited 8,274 individuals, from 274 institutions in 66 African countries.

Its fellowship pipeline has produced 1,635 women agricultural research leaders over that period, including Josephine Okot, the Ugandan entrepreneur and founder

of Victoria Seeds Ltd who won the prestigious Africa Food Prize in 2007 for establishing a successful export-oriented seed enterprise.

The US\$100,000 prize is awarded annually to recognise an outstanding individual or institution that is leading the effort to transform farming in Africa.

Dr Kaaria, who joined AWARD in February this year, says she got to see the impact of the organisation up close in September while attending the AGRF [African Green Revolution Forum] 2022 Summit in Kigali, Rwanda.

The annual forum convenes the who is who in Africa's agriculture to share lessons and discuss practical actions needed to move the continent's food security agenda forward.

"I met many delegates who told me they had participated in the AWARD Fellowship programmes, and they made me feel very proud," says Dr Kaaria.



*Dr Susan Kaaria with the previous AWARD Directors, Dr. Wanjiru-Kamanu Ruttenberg (L) and Dr. Vicki Wilde (R). Photo credit: AWARD*



*Dr Susan Kaaria, as Team Leader Gender at FAO, with other women leaders during the International Women's Day (8 March) 2020 with the theme, "I am Generation Equality: Realizing Women's Rights." The theme aligned with UN Women's multigenerational Campaign, Generation Equality, which marked the 25th Anniversary of the Beijing Declaration and platform for Action. Photo Credit: FAO*

This year's forum, held against the backdrop of a food crisis on the continent fuelled by the Covid-19 pandemic and the Russia-Ukraine war, emphasised the need for policy reforms to build resilience in food systems and achieve self-sufficiency.

Driven by our ambition to inspire African researchers working on food systems and demonstrate the possibilities in this area, AWARD facilitated its One Planet Laureate Candidates to participate in this year's AGRF. The Fellowship focuses on advancing knowledge on gender and climate change, mobilizing young men and women researchers to develop concrete climate actions to transform Africa's food systems.

It brings gender into the climate change conversation, equipping African researchers to develop innovative solutions that effectively respond to the challenges, needs, and priorities of men and women smallholders in the unique African farming systems.

At AGRF, the One Planet Laureate Candidates interacted with the key actors in African agri-food systems, enabling them to contextualise their research in emerging global trends and identify entry points for their contribution to global

conversations.

The One Planet Fellowship, a coalition of the One Planet Summit, is a unique partnership of private philanthropists and public research funders working to enhance research capacity on the African continent. The funding partners include the Bill & Melinda Gates Foundation, the BNP Paribas Foundation, the European Union and the Canadian International Development Research Centre (IDRC). Similarly, some of the solutions might also come from the Fellows of AWARD's newest career development programme -- the Gender Responsive Agriculture Systems Policy (GRASP) Fellowship.

The programme – funded by the United States Agency for International Development (USAID) – targets middle-career African women in the policy field to catalyse implementation of gender-responsive agricultural policies across Africa.

"It is not enough to have policies; the policies must be well-designed and based on evidence to address the real issues facing African agri-

food systems. We need agricultural policies that can help to close the gender gap in agriculture and rural labour markets, generate gains in agricultural productivity, increase food security, and foster economic growth," says Dr Kaaria.

"Through the GRASP Fellowship, we aim to grow a pool of confident and capable African women to lead policy changes to improve African women and men smallholders' livelihoods."

Women selected to join the programme will receive training on leadership, mentoring, policy advocacy, and gender in agriculture policy.

Dr Kaaria says she is excited about the GRASP Fellowship because of its potential to transform Africa's agri-food systems, citing the African Development Bank's Feed Africa Strategy for Agricultural Transformation, which emphasises equality and inclusion in policies.

"By supporting African women working in policy, this fellowship aims to promote a more inclusive and gender-equitable African agriculture, and to unlock the leadership potential of Africa's women in agri-food systems transformation," she says.

Dr Kaaria, who has more than 20 years of experience in development work and herself a past beneficiary of the AWARD Training programs, is a strong advocate of women advancing their professional careers, saying it gives them a better shot at succeeding in their roles in institutions and uplifting the lives of marginalised women and girls.

She was inspired to pursue a postgraduate degree by her frustrations at sometimes not being able to adequately address the struggles of the female farmers she interacted with in her first job as an agricultural extension officer.

"There was so much to learn from sitting with farmers, including the particular challenges women face.



*Dr Susan Kaaria (Right) attending a meeting as a field extension officer in Meru County. Photo Credit: Dr Kaaria*

But after three years as a field officer, I thought I needed to be in a position where I can help more and chose to enrol for a Master's degree at Iowa State University in the USA," says Dr Kaaria, who graduated with her first degree in agriculture at the University of Eastern Africa in Kenya.

On her return to Kenya with a Master's degree in Agricultural Economics, she joined Egerton University as a lecturer.

She has fond memories of her three years at the university teaching and mentoring undergraduate female students looking to pursue careers in agriculture.

"Being taught by a young female lecturer was useful because I could tell them, 'been there, done that', including travelling on bicycles to visit farmers," says Dr Kaaria.

Her PhD studies at University of Minnesota put her on a firm path to a career in research and international development.

It all began in Malawi where while attached to the Malawi Office of the World Agroforestry Centre (ICRAF),

she conducted research among rural farming communities between 1996 and 1997 during her PhD in Natural Resource Economics.

"Malawi changed my life. I had never seen that kind of poverty in my life. At that moment I realized that it was going to be important that my research should not only lead to publications but should always aim to improve the livelihoods of rural communities.

She would go ahead to work as a senior scientist at the International Center for Tropical Agriculture (CIAT) in Colombia and then later in Uganda, with her research aiming to develop participatory tools for catalysing rural innovation processes and increasing access and benefits from market opportunities, by poor and marginalised groups, especially women.

"The women farmers that we worked with initially lacked the courage to speak up in meetings, and would often be found sitting right at the back, behind the men. In the end, I was happy to see some of them join the market committees and go out to look for markets for their produce. And not

only that, they made enough to buy themselves *Chitenges* (African print cloth). If you can make a difference in Malawi, you can make a difference anywhere," says Dr Kaaria.

Before taking up her latest job at AWARD, she was the team leader for gender at FAO in Rome, Italy, from where she led a team of gender experts that were developing tools, methods, and generating data needed to support governments and other stakeholders to integrate gender in agricultural and food security policies, programmes and strategies.

"One of the things that COVID gave us was the moment to reflect. After 9 years away, I started asking myself, 'is this it? Is there something I can contribute to Africa'? I came to AWARD with a lot of excitement. My vision is to make it the go-to institution when it comes to promoting gender equality in agriculture in Africa," says Dr Kaaria.



*A smallholder farmer using a tractor on her farm, acquired through the Hello Tractor mobile application. Photo Credit: Hello Tractor*

# Tractor sharing app breaks new ground for smallholders

By Murimi Gitari

**T**HE success of Uber and Airbnb in transport and hotel industries offers lessons on the positive disruptions of the sharing economy.

But can the same success be replicated in agriculture?

Hello Tractor, an agricultural technology company, has broken considerable ground connecting tractor owners to smallholder farmers, increasing access to this important farm machinery at affordable costs.

The firm, founded by Jehiel Oliver, receives smallholder farmers' requests for tractor service on its booking agent app and pairs them with the appropriate tractor owners.

Justine Orutwa, the mechanization and IoT engineer at Hello Tractor, says the innovation has reduced the hiring inefficiencies that previously made it difficult for smallholders to access tractors and enabled tractor owners and manufacturers to expand their markets and reach new customers.

"Traditionally, this has occurred through word of mouth and poorly coordinated referrals: a friend of a friend knows a farmer in need of plowing and sends them to a tractor owner, cooperative, or hiring association that may or may not be able to deliver service," Orutwa says.

"Average farm sizes are under one hectare and plots span large geographies, making the coordination of tractor deployment difficult.

Scheduling and record keeping are done by memory or by hand, if at all. This results in an inefficient smallholder market that lacks economies of scale and is costly to service."

Tractor owners, he says, have also been grappling with high operational costs, fragmented distribution networks, and difficulty maintaining proper oversight across large serviceable geographies

"So far, we have connected over 3,000 tractors which are accessible to farmers within the tractor region. Through our platform, we have been able to service over five million farmers and we're looking to increase the number to 10 million," Orutwa says.

By expanding tractors' serviceable geography, Hello Tractor enables owners to grow their business, providing employment opportunities for service providers and rural booking agents. With equitable access to tractor services, smallholder farmers are now able to earn more and grow more, improving livelihoods and food security for their families and communities.

Hello Tractor currently has operations in 18 countries in Africa: Kenya, Nigeria, Ghana, Cote D'Ivoire, Sierra Leone, Mali, Senegal, Benin, Ethiopia, Uganda, Tanzania, Malawi, Zimbabwe, South Arica, Swaziland, Angola, Mozambique, and Rwanda.

It also has a presence in six countries outside Africa: India, Jamaica, Pakistan, India, Bangladesh and Thailand with plans to expand beyond these territories.

The company's farm machinery offerings include implements for hay mowing, hay baling, chaff cutting, silage as well as trailing.

It recently launched Hello Tractor Financing, a pay-as-you-go (PAYG) model that provides financing for



**Smallholder farmers are trained on operating the tractors.**  
**Photo Credit: Hello Tractor.**

entrepreneurs who want to create jobs by capitalising on the demand for tractor services on Kenyan farms, but who lack traditional forms of collateral.

The PAYG model focuses on the revenue tractor owners can generate as opposed to the existing collateral in the hands of borrower like vehicle logbook or land tittle deed.

Three years ago, the company signed a deal to manage a fleet of 10,000 tractors supplied to Nigeria by John Deere. The tractors were to help bring nine million hectares of land into production, growing an extra 37 million tonnes of food and creating two million new jobs.

"While the rates of tractor availability in most emerging markets have increased over the last 40 years, the number of tractors per hectare of arable land in sub-Saharan Africa has declined. When tractors are not available, farmers cannot make full use of their land; either they will not fully cultivate their plots or parts of their crop yields will rot before they are able to be harvested," Orutwa notes. Tractor use also allows for field preparation, planting, and harvesting in a less time and labor-intensive way, enabling family members to pursue off-farm opportunities.

In 2021, the company won the AyuTe Africa Challenge award by Heifer International that recognises efforts towards expanding agricultural innovation technology in Africa. Orutwa says the company pumped the funds they received to the PAYG asset financing model.



**Hello Tractor CEO Jehiel Oliver (right) poses for a photo with a farmer next to a tractor. Photo Credit: Hello Tractor.**



**A Zipline drone delivering swine semen package.**  
**Photo Credit: Zipline**

# Semen on drones fattens Rwanda pig industry

By Lydia Atieno

**I**T'S 10 a.m. at the Zipline Center in Rwanda's Muhanga District and at least four drones have already landed after successfully delivering swine semen to veterinarians. Last month, over 1,000 deliveries were made; officials say their aim is to make more than 3,000 by the end of this year.

Early this year, Rwanda began delivering swine semen through the use of drones to facilitate access to improved breed and boost farmers' incomes under the Livestock Master Plan launched in 2017.

The pig industry is expected to be a major contributor to Rwanda's meat production. According to the Rwanda Livestock Master Plan, the overall target was to raise pig meat

production from 19,945 tonnes in 2016/17 to 67,076 tonnes by 2021/22, an increase of 239 percent.

The Agricultural Household Survey of 2020 put the pig population in the country at 1.2 million.

The semen distribution is done through a partnership between Rwanda Agricultural Board (RAB), and Zipline, a medical product delivery company.

Swine semen is used in artificial insemination to improve pig production.

## How it works

Currently, Zipline works with more than 100 veterinarians across the country to help these services reach the farmer in an effective way.

One dose of semen costs between Rwf3000-6,500 at the collection centres. Pig farmers across the country through their veterinarians place an order from RAB on which kind of breed they need.

After confirming the location, the Zipline is then given the final order to put in their system for delivery. After collection from RAB, the swine semen is kept at 17 degrees Celsius, which keeps it warm enough to avoid significant membrane damage or loss of sperm function.

Aphrodis Mukeshimana, a veterinarian in Southern Province, says past efforts to roll out artificial insemination for pigs faced difficulties related to transporting semen from the processing centres to the stockbreeders who need them.

"As you know, swine semen requires rapid delivery, immediately after collection for it to be safe and effective, which is different from cattle semen which can be stored in liquid nitrogen and can be frozen and kept for years," he says.

Providence Manikuzwe, a project manager at Zipline, says that after receiving an order, they conduct tests to ensure the mobility of the sperms and the temperature is right.

Farmers are also sensitised on using the artificial insemination method.

Manikuzwe says it takes only five minutes to prepare the order internally and depending on the destination of the receiver, it normally takes them no more than 30 minutes to complete the full delivery.

For the longest distance they had to cover so far -- 180km -- it took a drone 45 minutes to deliver pig semen to destination.

Farmers purchasing semen from Muhanga District where the drone station is situated previously had to wait for a good three hours to receive their orders as they were being transported in public or private cars.

Simon Muhire, a pig farmer in Muhanga district, says the drone delivery programme has helped them cut costs.



*An agrovet from Ruhango District, south of Rwanda holding a Zipline delivery of swine semen. Photo Credit: Zipline*

"We no longer incur much in transportation costs as time has shortened. Also, at the moment, we are not incurring the cost of keeping

the boar, which is expensive and can cause a risk for us as farmers as it might contract a disease [and spread it as it mates many sows]," he says.

Fabrice Ndayisenga, Head of Animal Resource Research and Technology Transfer Department at Rwanda Agriculture Board (RAB), says the pig semen being delivered to farmers is from pure pig breeds imported from Europe.

RAB targets having many more farmers getting such breeds for the genetic improvement of their animals. The pure breeds include Large White, Landrace, Pietrain and Duroc.

"Farmers had difficulties accessing the needed semen before, but now, it's much easier and it costs less to get the services on time," says Jean Claude Shirimpumu, the chairperson of the Rwanda Pig Farmers Association.

"This initiative saves the cost for the farmer because raising a boar is expensive as feeding it is costly yet they only need it for mating purposes when the sow is on heat," he concluded.



*Pigs in a pig shed in Muhanga District, Rwanda, where swine semen is being delivered to farmers using drones. Photo Credit: Zipline*



*Eng Ezekiel Kuria, Isuzu East Africa's Body-building & Vehicle Engineering Manger explaining how a refrigerated truck operates. Photo Credit: Murimi Gitari*

# Refrigerated trucks cut fresh produce losses on transit

By Murimi Gitari

**R**EFRIGERATED trucks are helping Kenyan fresh produce distributors to cut losses during transportation.

Agricultural tech startup Twiga Foods, which collects produce from farms or aggregation points and delivers to retailers in urban areas across the country, says the use of the refrigerated trucks supplied by motor vehicle assembler Isuzu East Africa has minimised losses caused by mechanical damage or overheating.

"As a company we get produce directly from the farms and distribute across the cities to the vendors and with the insulated trucks from Isuzu, we have managed to store and transport the produce without any losses," says Beverlyl Mutua, the FMCG Manager at Twiga Foods.

She says the company gets fresh fruits from over 17,000 farmers across the country and receives over 30,000 visits by retailers on its digital platform every week.

"Fruits being perishable products require a transport solution that is reliable," Ms Mutua says.

Between 20 and 30 percent fresh produces occur during transportation from the farms to the market.

Motor vehicle assembler Isuzu East Africa, says it designed the cold chain logistics vehicles after realising that this category of their customers, including farmers and retailers, were incurring huge financial costs importing second-hand cooling units.

A cooling unit costs about Sh1 million without guaranteed aftersales servicing

Eng Ezekiel Kuria, Isuzu East Africa's Body Building & Vehicle Engineering Manager, says that in addition to meeting the transport requirements of perishable goods, they were also keen to address food safety, hygiene and quality concerns.

"We realised there were significant logistical hurdles as a company that are faced by these retailers and the farmers. In some cases, you would see meat dealers relying on temperatures of 5 degrees between the early hours of 3am to 5am, risking their lives from cold-related sicknesses, with negative impact on life-work balance," says Mr Kuria.

The refrigerated trucks have a special insulated body and come with a fully sealed or airtight rectangular cabin with sufficient thermal insulation properties that prevent heat exchange with ambient environment.

These trucks are also customised to have a temperature control unit and one can adjust temperatures at the touch of a button from the driver's seat with real time monitoring. Temperature data can be printed out from a printer installed inside the vehicle.

Temperature controls range from 5° C to -5° C for chilling products such as flowers, milk and meat, -5° C to -18° C for preserving products such as seafood and -18° C to -30° C for freezing products like ice creams.

"Pre-cooling is done before products are loaded onto the truck, then the driver sets the required temperature and also monitors the cargo temperatures during transit.



***One of the refrigerated trucks at the company's assembling plant, used in transportation of perishable products. Photo Credit: Murimi Gitari***

The suppliers and consumer can remotely monitor the temperature of the cargo throughout the journey which gives assurance that goods delivered are of superior quality," says Mr Kuria.

Some of the trucks can be used to transport different perishable products at the same time. "In this scenario, a multi-temperature zone refrigerated truck is used whereby it is divided into two kinds of single-temperature zone control panels that are provided to allow for varying temperatures for each compartment independently," he says.

Depending on the type of product to be carried and the need of the customer, he adds, they may install a cooling unit that can run while the truck is turned off. The trucks can be built and designed with different types of cooling systems suited to short or long distances.

Victory Farm, a company in the business of fish, entered a partnership with Isuzu to acquire trucks for transportation of fish from the lake to the vendors.

"Fish being a perishable product requires to be handled and transported in a very careful manner so as to reach its final destination in its quality condition and this necessitated us to approach Isuzu to get the trucks," says Amit Grabvoski, Victory Farm's commercial manager.

Stephen Mungai, a banana farmer in Meru County, has also found the refrigerated trucks convenient for transporting farm produce.

"With most parts of Meru being slopy, the Isuzu trucks have proved to be a good transport solution for our bananas as they have been designed in such a way that they cannot get stuck anywhere while coming to pick the produce," he says.



*Mr Giblert Econi a technician of Proul Uganda Ltd, demonstrates use of the various seed planters during farmers sensitization meeting in Pader district Northern Uganda. Photo credit: Lominda Afedraru*

# Seed planters ease the sowing pain

By Lominda Afedraru

**S**INCE time immemorial, the majority of small-scale farmers in Uganda have used the rudimentary hand hoe for planting - a painstaking activity that involves one moving back and forth digging up holes, dropping in seeds and covering them with soil.

Now, local farm machinery dealers are stocking seed planters, which enable farmers to do the same amount of work in a much shorter time using considerably less energy.

Giblert Econi, a technician at Proul Uganda Ltd, says the seed planters come in different types and are cost-effective, suited to sowing the big-size

seeds such as beans, groundnuts, and maize and are easy to operate.

There is also a machine for planting the seedlings of vegetatively propagated crops like fruits and vegetables.

Proul Uganda also sells a wide range of agromachinery used in processing of farm produce, value addition and harvesting.

## Potable seeder

It has a capacity of accommodating 2-3 kg of seed which is pressed to the ground manually using its handle. Pressing the springs enables the seed cap to open and release the seed into the hole.

The hole is covered automatically when pulling the lid out.

It contains a regulator which holds the number of seeds to be planted per hole depending on the crop, and costs about UGShs200,000.

A farmer can use the potable seeder to plant between one and two acres in a day depending on experience operating it.

The sowing parts can be replaced if they break down or fail to work.

## Hand push seeder

This tool on wheels comprises of chambers where both seeds and fertiliser are fed.

While using it, a farmer is required to have a bag containing seed and fertiliser which are fed into the seed and fertiliser chambers.

The chamber for seed can accommodate 1kg of seed.

It is important to ensure the land is prepared well to enable easy movement.

The double chamber machine has an added advantage because it will create a hole both for seed and fertiliser application. Once the farmer rolls and pushes the lid to the soil, it will drop seed in one hole and fertiliser in the other.

The double hand push machine costs Shs750,000 while the single handle seed planter goes for Shs700,000.

### Transplanters

These are tools used in planting seedlings of vegetatively propagated plants. These include seedlings of

tissue culture banana, coffee, oranges, mangoes and trees species such as Eucalyptus. Vegetables such as cabbages, eggplant, red pepper and sweet pepper can also be planted using a transplanter.

A farmer is required to place one seedling in the seed chamber at a go. The machine costs Shs250,000.

### Farmer uptake

Mr Econi says farmers can purchase these machines as individuals and as farmer associations.

He says uptake is, however, much higher among farmers who deal in seed processing and seedling multiplication.

Farmers who buy the machines as a group normally have the tools kept in the association stores, with each member accessing it through the stores' management. Each farmer pays a maintenance fee every month.

“

**The double chamber machine has an added advantage because it will create a hole both for seed and fertiliser application. Once the farmer rolls and pushes the lid to the soil, it will drop seed in one hole and fertiliser in the other.**

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*Plastic hand push seeders that are being used by farmers in Uganda for seeds planting. Photo Credit: Lominda Afedraru*



*Workers inside the Tadu Dairy Cooperative which is a multipurpose cooperative with modern equipment for processing milk, cheese and yoghurt. Photo Credit: Elias Ngalame*

# Cameroon cooperative's services pull herders, women to commercial dairy

By Elias Ngalame

**D**AIRY farming has traditionally been practised in Cameroon manually especially among the nomadic Mbororo community. But Patu Jume Shang, a biochemist by training and a value chain specialist, broke with the tradition a few years ago when she set up the Tadu Dairy Cooperative in Kumbo in Northwest region to mechanise dairy production.

Today, Tadu brands dairy products such as processed milk, cheese and yoghurt are household names in Cameroon.

The success of the multipurpose cooperative, with its adoption of

modern equipment, improved dairy breeds, improved production practices and modern value-adding technologies, has made over 400 cattle herders take interest in dairy production.

Ms Shang said there was need to modernise dairy farming in Cameroon in general and the Northwest in particular.

"I opted to invest in the domain to satisfy growing demand," she said.

The Tadu Dairy Cooperative started off using artificial insemination to upgrade the local breeds.

"The red Fulanis and the white Fulanis which are the local breeds here gave us just about a litre or

two of milk. So, since we needed much milk, we decided to improve the breeds," said Ms Shang.

The co-operative project now provides its members with access to new breeds, improved production practices and modern value-adding technologies.

The project idea was born out of the need to modernise the traditional system of dairy hitherto practised by the local Fulani and Mbororo herders in the region.

Also, there was need to empower the Mbororo women who were doing a lot of work to support their husbands but their efforts remained in the background.



***Patu Jume Shang, a biochemist by training and a value chain specialist, the founder of Tadu Dairy Cooperative in Kumbo in Northwest region of Cameroon that specialized into mechanised dairy production.***  
***Photo Credit: Elias Ngalame***

"When we found out the enormous work the women here were doing manually, albeit in the background, we engaged in this dairy farm project to bring them to the fore," Ms Shang said.

Today the Mbororo women constitute 75 percent of the dairy farmers who supply the Tadu milk processing factory.

The factory makes yoghurt, butter and cheese using modern equipment.

About 300 smallholder dairy farmers supply milk to the factory and over 30,000 families rely on dairy farming under the cooperative as their source of income.

The cooperative collects 3,000 litres of milk daily.

The success story of Tadu has secured it support from the government and other agencies with interest in the dairy value chain.

The smallholders Dairy Development Project (SDDP) has facilitated the assembling of critical pieces of dairy development equipment and infrastructure such as range management appliances, water supply networks, electrical power supply lines, adequate cattle crossbreeding stations as well as adapted milk collection and transformation facilities.

"Our farmers and dairy employees have been trained on improved hygiene during the milking and processing phases (thermal treatment, packaging and storage) and entire dairy production chain," Ms Shang said.

Tadu works with the Ministry of Livestock, Fisheries and Animal Husbandry on quality aspects such as regular supply of natural nutrients, cleanliness, testing for alcohol and fat contents in the milk and checking for milk adulteration with water.

The project, however, faces some difficulties, including irregular electricity supply and bad roads that make transportation of raw materials to the production center and later the market challenging. There is equally insufficient number of vans to deliver the finished products to consumers far and near.

However, Tadu Dairy Cooperative officials say they are making inroads, expanding yoghurt, cheese and butter sales in Bui, Bamenda, Yaounde and beyond.

Tadu dairy products are sold throughout Cameroon and some parts of Nigeria.

The per capita milk production in 2010 stood in Cameroon at 12.8 kg while per capita consumption was at 15.3 kg in 2010. But by 2021, milk production in the country had substantially increased from 48,000 tonnes to 204,000 tonnes, partly thanks to the contribution of agribusiness projects like Tadu.

However, the production is far from satisfying the local demand for milk and milk products, experts say. The project has triggered many other enterprises along the value chain, including feed retailing shops selling cotton seed cake, wheat bran, rice bran, soya bean cake, fish meal, palm kernel cake, bone ash, limestone meal and blood meal.

"Our vision is to expand dairy production growth and development in Africa through small and medium-sized enterprises," said Ms Shang.



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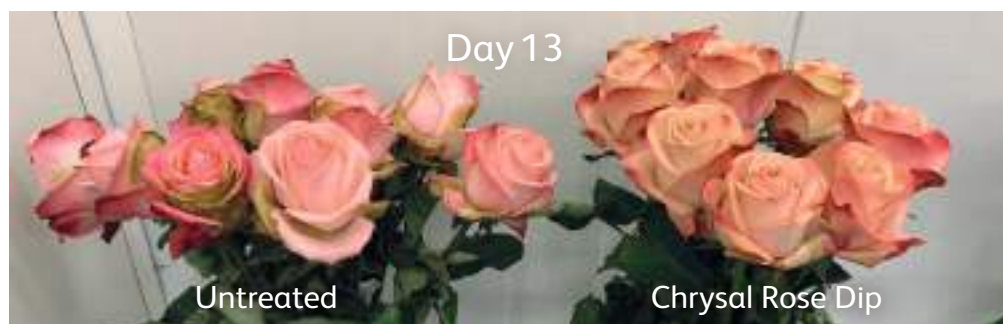


## Chrysal Sea Freight Service

is a unique post-harvest service concept that keeps flowers fresh and controls Botrytis during sea freight and long storage. Gives farms, bouquetmakers and importers the opportunity to use sea freight over air freight, with a significant decrease in carbon-footprint in logistics. Moreover, with the long storage concept, clients can improve on their rejection rate of cut flowers to the market and time the market better. This reduces overload and supports a more efficient supply chain.

- Helps keep flower fresh during sea freight.
- Reduces CO2-footprint by up to 92% versus air freight.
- Controls Botrytis & ethylene.
- Keeps colours fresh.
- Data monitoring and reporting by Chrysal technical team.

## Test



Vase life test: untreated roses vs. treated for Sea Freight Service. The treated roses have no Botrytis, have kept their colour or even deepened it, opened uniformly and have a longer vase life.



*TingA's Potato Manager, Consolata Wachira on a potato plantation in Narok County. Photo Credit: TingA*

# Farm machinery renting drives up potato harvests in Kenya's Narok County

By Murimi Gitari

**A** LOW level of agricultural mechanisation or use of outdated equipment by smallholders is partly blamed for their declining production and meagre, if any, profits.

Even where the farm equipment is available, the high costs put them beyond the reach of a majority of the small-scale farmers.

TingA, a project of Quipbank Trust Limited, has sought to tackle this problem with a community short-term leasing plan that allows farmers to access farm equipment without having to buy or own it. To lease the equipment, individual farmers or groups are required to place an order by registering on its online-based platform using a mobile phone, a tablet or a personal computer.

TingA's community model concept allows farmers to access mechanisation services through already established units such as NGOs, informal investment groups (chama), savings and credit cooperative societies (saccos), or churches.

In Kenya's Narok County, TingA has helped potato farmers to significantly boost their production.

TingA's Potato Manager, Consolata Wachira, says their farm equipment services have helped improve the production by 300 percent and reduced post-harvest losses by 90 percent in the county.

Many small-scale farmers have limited access to specialised agricultural implements such as air seeders, harrows, chisel ploughs and cultivators.

"Many small-scale farmers have limited financial resources and are unable to purchase their own tractors. We are providing a platform where they can access these machines communally which is cheaper and very convenient," says Ms Wachira.

"We started offering our services six years ago. Since then, we have launched various E-Tinga platforms such as the E-Tinga app, and E-Tinga website and have also initiated farmer training campaigns all over Kenya to educate farmers on how to productively utilise modern farming machinery. All of these projects have allowed farmers to learn, book and share farming machinery.

So far, we have had the pleasure of benefiting over 10,000 farmers and 20 farmer groups all over Kenya."

The seeders used in planting, for example, reduces labour costs, improves quality of farm life and increase productivity.



*TingA tractor working on a farm in Narok County where production of potatoes has increased due to the leasing of the tractors by the firm. Photo Credit: TingA*

The firm also has a wide range of combine harvesters that cut, thresh and clean grains in one operation as well as pest control equipment.

The farm equipment lender opened a branch in Narok where farmers access the equipment easily.

“As residents of Narok, we are pleased to have the mechanisation experts around. We are excited to access their services and equipment which have been brought closer to us and we expect to improve our farm productivity and living standards with the help of TingA,” Reuben Salaon, a farmer in Narok’s Ntulele area notes.

The firm uses cutting-edge technologies to give farmers access to its farm equipment. One of these is its web-based platforms and mobile app, E-TingA, which allow farmers to register and order services as groups or individuals online. The app has an easy-to-use interface with a variety of options to suit all the farmers’ needs. Due to its user-friendliness, farmers can rent farm equipment from the comfort of their homes.

“We realised the growing demand for mechanised farming and since a majority of farmers are small holder farmers, renting machinery was far cheaper. Furthermore, due to current seasonal changes owning a tractor seemed impractical for many,” says Ms Consolata.

Through a partnership with AgriFi project funding awarded to VAELL leasing Limited by Self Help Africa, TingA has so far trained more than 10,000 farmers across the country, sensitising them on modern potato farming techniques. This has been achieved through partnerships with farmers associations and groups. The farmers have also been trained on how to share and book services through TingA’s online platform dubbed TingA Rental Store.

The farm equipment renter has replicated the success of its leasing model in Tanzania and plans to expand to other countries in the region such as Zambia and the DRC. Its expansion strategy involves establishing agricultural

hubs, strategic partnerships, and diversification of services leveraging on technology to meet a growing clients’ needs.

TingA’s innovation won the Key Industry Leadership recognition in the Pacesetters Awards Kenya organised by Jubilant Stewards of Africa (JSA), an NGO dedicated to improving living standards, social ethics, dignity and empowerment of communities.

The firm is currently constructing warehouses and storage hubs for farmers in the second phase of its expansion. Its state-of-the-art warehouse in Narok, under construction with the support of the European Union through the Agrifi Project, is expected to save farmers from losses caused by weevils and natural produce spoilage. The construction of facilities such as cold storage in the area will enable farmers to delay the sale of their crops such as potatoes for up to four months thereby helping them withhold harvest and wait for prices to rise.

# Cocoa farmers deploy drones for disease, pest control

By Elias Ngalame

**T**HE use of drones and artificial intelligence in West Africa's cocoa production belts is helping farmers to monitor and control pests and diseases, significantly minimising production costs.

With support from Cameroon UNDP accelerated laboratory, farmers in Tambe in Cameroon's Centre region were provided with drones and artificial intelligence technology that they use to monitor the myriad of diseases affecting their cocoa crop.

Cameroon drone inventor William Elong is working with the farmers to provide data on pest and disease detection, enabling them to apply chemicals on time.

Antoine Mani Tonye, a cocoa farmer in Ebolowa, Cameroon's South region, says he can now tell if a cocoa pod will do well at maturity or not thanks to artificial intelligence that provides farmers with frequent updated data on present or potential disease attack.

Farmers also say they have seen healthy yields and an improvement in their income since they began planting a disease-resistant variety developed in a laboratory and receiving information from drone surveillance.

They say over 30 percent of production losses are caused by pests and diseases but with the drone surveillance, they are able to prevent massive destruction of crops.



*A cocoa farmer operating a drone on his farm in Tambe, Centre Province of Cameroon. Photo Credit: Elias Ngalame*

"I receive regular information updates on my phone via SMS messages, which enable me to take the necessary steps to ward off any menace," Agbor John, a farmer in Yaounde, said.

In this hilly rainforest region, cocoa is grown commonly under trees, making movement by farmers consequently difficult.

But with the introduction of drones and artificial intelligence technology most of the farmers say they are able to overcome these obstacles.

"Since the introduction of drones for monitoring my cocoa quality has improved and income as well," Agbor said.

There are 600,000 cocoa farmers across Cameroon, and it is a vital sector for rural communities. But cocoa is a fragile crop with yields that tend to decrease over time, putting farmers' livelihoods at risk. That's why the African Development Bank (AfDB) and UNDP have committed funding to the Institute of Agriculture Research for Development (IRAD), where research is focused on creating adapted seed varieties and the use of technology via drones to update farmers with the right information at the right time.



**A drone used for experimental purpose by the UNDP Cameroon Accelerator Lab hovers in a cocoa field plantation. Photo Credit: Elias Ngalame**

“We seek to improve quality and quantity for the wellbeing of our farmers,” said Kang Ekungwe, a senior agriculture official in the Southwest region.

Low-tech labour has been cited as being among the reasons for the low profitability and little transformation in agriculture in much of sub-Saharan Africa.

Crop failures have also become more common in the face of climate change.

But experts say better technology could spur more processing, distribution, and marketing, all of which could boost food security and create more jobs.

In Cameroon, IRAD is setting up more seed production fields across the country.

A new high-yielding seed variety called “Brazilian cacao” is now widely in use.

“Before, our parents used to grow a variety called ‘tout-venant’, but today, thanks to advances in research and technology, we have access to improved seeds,” said Samba MVienna, the chairman of AKOM-COOP-CA, a cooperative of farmers.

“You get the first yields 18 months after planting them, with flowers and a few pods on some stems. After two or two and a half years, or three years, you can already get a perfect crop.”

The improved incomes from growing the high-yielding cocoa seed varieties have helped to stem the migration of young people from rural villages to seek work in the city.

“Their decision to engage in the cocoa sector stems from the availability of improved seeds and the new intelligence monitoring technology that allow for quick and bountiful harvests,” Samba said.

Yannick Fosso, a trader, buys cocoa from across the region and sells it in Cameroon’s economic capital, Douala.

“The season runs from August to January. I make all my year’s earnings during those six months,” he said.

“When you look at the plants, you can see that Brazilian cocoa is a better variety than the ones that our parents used to grow. Its colour is much brighter, the pods never get black, they are entirely red. So when you brew it, it comes out with a very good colour and taste.”

Cocoa is Cameroon’s second export crop. The majority of the Central African nation’s annual output of about 220,000 tons is shipped overseas from Douala’s Atlantic port.



**A technical team explaining the use of drones. Photo Credit: Elias Ngalame**

# How regulation of key food crops is giving Kenyan farmers a better deal

**Q&A: Beatrice Nyamwamu, the Director-General of Kenya's Agriculture and Food Authority, speaks to PanAfrican Agriculture about the agency's achievements and challenges enforcing rules in the country's crop sector and her own role in reforms credited with shielding farmers from exploitation.**

## **Briefly tell us about yourself, who is Beatrice Nyamwamu?**

I am a Kenyan citizen, born in the highlands of Kisii County and a staunch Adventist. I hold a Master's degree in Agriculture Resource Management from the University of Nairobi. I have worked in the public sector for a period of 25 years in various capacities with a competency in agriculture policy and legislation, food security and safety analysis and a diverse experience and knowledge in the public sector management. Additionally, I am a mother of two sons.

## **What is the mandate of AFA?**

Our mandate, as a State corporation, is to regulate the crops sector in Kenya to ensure compliance with standards, and codes of practice. Regulation fosters a thriving competitive environment where innovation, technological progress, order and quality flourish, for sustainable economic growth. We administer the Crops Act No.16 of 2013 to promote best practices in the production, processing, marketing, grading, storage, collection, transportation and warehousing of agricultural products; collect and collate data, maintain a database on agricultural products, document and monitor agriculture through registration of players.



**Beatrice Nyamwamu, the Director-General, Agriculture and Food Authority (AFA) Photo Credit: AFA**

The authority is also responsible for determining the research priorities in agriculture and advising the national government and the county governments on agricultural levies for purposes of planning, enhancing harmony and equity in the sector.

AFA is also mandated to recommend general and specific policies for the development of scheduled crops as well as monitoring and disseminating market information, including identification of the local supply demand situation, domestic market matching and overseas market intelligence and promotion activities on scheduled crops.

We promote the establishment of agricultural produce collection centres in viable areas to serve as buying stations of farm products, packaging houses, pick-up points and meeting places of farmers' and growers' cooperatives plus establishing linkages with various governments and private research institutions for the conduct of studies and researches designed to promote the production, marketing and processing of scheduled crops.

We also devise and maintain a system for regularly obtaining information on current and future production, prices and movement in trade; establish and enforce standards in grading, sampling and inspection, tests and analysis, specifications, units of measurement, code of practice and packaging, preservation, conservation and transportation of crops to ensure health and proper trading and to promote and advise on strategies for value addition for scheduled crops.

Lastly, we recommend general industry agreements between farmers and scheduled crops value chain players and also prescribe the minimum period within which farmers are to be paid for crops delivered and penalties for delayed payments.

### **Previously you worked as the Head of Regulation and Compliance at Food Crops**

### **Directorate, what would you say was your legacy in that docket?**

The Food Crops Directorate was formed during the merging of the former regulatory boards in the crops sector into AFA. The food crops sub-sector was hitherto unregulated since independence and I spearheaded the development and gazettement of the Crops (Irish Potato) regulations, 2019 and the Crops (Food crops) regulations, 2019 through coordination of a multisectoral team comprising both private and public sector professionals.

I also led the process of operationalising the same regulations by building capacity of the county and AFA officers in the directorate, development of the operationalisation manuals and training of crops inspectors to ensure compliance to the legal framework.

During my time at the directorate I was a member of the multiagency National Food Safety Taskforce which drafted the Food Safety Coordination Bill and the development of an aflatoxin prevention and management framework in Kenya, focusing majorly on co-regulations and self-regulation procedures.

### **Why were the food crop regulations necessary?**

The regulations were necessary after realising that farmers were being exploited due to a lack of official controls and exploitation of farmers along the food crop value chains as well as inadequate enforcement of standards in the local markets, with the exception of the food crops manufacturing sector.

Inadequate use of best practices from farm to fork, which contributed to high post-harvest losses, poor quality produce in the market and flooding of produce and products from imports at the expense of local production were some of reasons for developing the two regulations.

With these regulations now in place, we have seen investment in the subsector by the county governments, private sector and donors such as in the infrastructure, potato cold chains, and subsidy of inputs to farmers. Donors such as IFAD have now come in to offer

structured support to farmers and farmer associations.

The issue of food safety is also being addressed through identification, nomination and gazettement of crop inspectors. Counties and AFA now conduct inspections and surveillance of produce, warehouses and processing plants, inspections and sampling of imports at point of entries.

There is also enhancement of traceability of produce. There is a more structured engagement with processors such as millers especially Cereal Millers Association (CMA) who are very supportive in championing the food safety agenda.

These regulations have also led to sanity in the industry as pertains packaging Irish potatoes in 50kg bags. The big extended bags have been phased out of the market. Marketing of produce such as wheat has been streamlined with registration of marketing agents and strict adherence to the set minimum prices and lastly there is improved data generation and management through automation of the regulations.

Regulations for other value chains have been developed and are in implementation phase.

### **Recently AFA reviewed the avocado maturity indices as well as post-harvest handling process. What led to this and what do you aim to achieve?**

According to Codex Alimentarius, the Dry Matter (DM) content for avocados should not be below 20 percent, which is the minimum for physiological maturity. The Authority and industry had set the DM at 22 percent, which was not sufficient given the time taken before sampling after harvest.

Samples are taken for more than four days of harvesting, giving a false DM. The correct DM should be taken within four hours of harvest. Due to these factors, AFA and industry actors and agreed to increase the DM content to 24 percent. The increase was majorly due to our small-scale production and handling. It takes up to four days to

aggregate the fruits and transport to the packhouse. On reaching the packhouse, a considerable amount of moisture is lost, giving a false DM. Fruits which had a moisture content of less than 20 percent could read 23 percent or 24 percent.

During a Kenya Horticulture Industry Taskforce trip to EU in March/April, 2022 France proposed a DM of 24 percent while Belgium proposed 25 percent. Increasing the DM is aimed at helping our avocados access these markets among others thus increasing our exports earning.

Use of open pick-up trucks and Probox [saloon] cars without crates was impacting negatively on the quality of the avocado fruits. We therefore reviewed post-harvest handling processes together with industry stakeholders and agreed on the use of transport vessels and packhouses. This is stipulated in The Crops (Horticultural Crops) Regulations 2020, regulation 18, which requires all dealers to package and store produce in appropriate facilities and use transport vessels that maintain optimal temperatures and hygiene to prevent damage, contamination and spoilage of produce.

### **In the recent past, we have seen some directorates are seeking autonomy once more from AFA. What is informing their sentiment?**

The AFA Act, 2013 and the Crops Act, 2013 consolidated several pieces of legislation in the agriculture sector. The AFA Act also repealed various statutes relating to crops. This included abolishment of eight regulatory authorities, which became directorates in AFA. However, Section 11(3) of the AFA Act, 2013 accorded the directorates semi-autonomy in performance of their functions.

Consolidation of the various pieces of legislation into the AFA Act and Crops Act were envisaged to create an enabling legal and regulatory environment for both local and foreign investors to venture into production, processing, marketing and distribution of crops in all parts of the country; bring efficient service delivery, resulting

from enhanced synergies, and faster decision-making processes and reduce costs of running the previous institutions through centralized operations. This consolidation was also to help reduce duplication and overlap of functions among institutions involved in regulation of the crops, circumvent unnecessary regulatory bureaucracy in the sector as well as improve business operational environment and reduce cost of doing business.

The establishment of AFA was supposed to be followed by the development of commodity-specific regulations. This did not take place fast enough as had been envisaged. The Authority could not therefore perform some of its functions as expected. This became a concern for some stakeholders thus the call for the Authority to revert to the previous boards. We have now developed regulations and so far have done well to ensure we deliver on our mandate.

### **The sugar sector is also facing challenges, with efforts to revive it hitting a snag. What is AFA doing to address the sector's challenges?**

The biggest challenge to the sugar sub-sector is the cost of production. Ninety-four percent of all cane is grown on smallholder farms. Currently average land size for sugar growing for out-grower farms is 0.6 Ha. This makes mechanisation difficult. To address this challenge, AFA is encouraging cane farming in blocks.

Most of the sugarcane is grown under rain-fed conditions and at high altitude where water and temperatures are limiting factors. The crop takes two years to mature and yields are low compared to cane grown in low altitude and under irrigation that take one year. AFA in partnership with some sugar millers has undertaken trials on cane growing under irrigation with good results. One new factory has been completed in Kwale and two additional ones are under development in Kilifi and Garsen.

These will rely on irrigated cane. A big cost to the sugar cane farmer is the cost of land preparation. AFA in partnership with the Sugar Research Institute, some millers and county governments is undertaking validation trials on different land preparation regimes, including minimum and reduced tillage.

Lack of adequate specialised financing for cane farming remains a big challenge. With the reintroduction of the Sugar Development Levy, this will be addressed. It is hoped that the current Senate will conclude the passing of the Sugar Bill to make this a reality.

To bring down the cost of seed cane, AFA is collaborating with the Sugar Research Institute on a project to propagate seedlings using the single eye bud chip technology.

The research-extension-farmer linkages are weak and as a consequence the dissemination of research recommendations are constrained. With agriculture being devolved, AFA has been undertaking capacity building of county agriculture extension staff in sugar cane agronomy and good agricultural practices.

To assist the inefficient government-owned sugar factories, AFA made a proposal to the national government that saw Ksh1.5 billion released for factory maintenance and payment to farmers. This has enabled the millers to undertake the long overdue factory rehabilitation thus enabling them to improve their operation efficiency.

AFA has financed installation of 11 cane testing units. This will allow for the introduction of cane payment based on quality. It is anticipated that this will encourage farmers to produce good quality cane for increased incomes. The system will also encourage millers to be efficient and pay farmers promptly.

### **Kenya hosted the G-25 Africa Coffee Summit mid this year. What were the outcomes of the summit?**

The inaugural G25 African Coffee Summit was aimed at marshalling consensus and providing policy

directions on anchoring coffee as a trade commodity under the African Union and enhancing trade under the current African Continental Free Trade Area Agreement (AfCFTA). It sought to mobilise the necessary political and financial support for enhancing the contribution of coffee in the economy of African countries.

The declaration of coffee as a strategic crop under the African Union will go a long way in enhancing the contribution of coffee in the economy of African Countries. The AfCFTA framework will afford an opportunity for the continent to build a unified market of 1.3 billion people with a potential GDP of US\$3.4 trillion across the 55 member states of the AU.

It was also agreed at the summit that there is need to undertake a study on the impact of domestic coffee consumption on the long-term economic growth of coffee-producing countries. Another key resolution was that African countries need to dialogue with EU on regulations regarding clearing of forest land to plant coffee.

### **What are the challenges leading and managing such a big organisation? Do you see any unique challenges as a woman?**

The various directorates were former boards with different organisational

culture. Developing an organisational culture for the Authority has been a challenge. Our mandate is huge and requires adequate resources, including financial and human resources. There have not been adequate resources to enable the Authority effectively deliver on its mandate. We have not had a board for a long period of time, which has impacted negatively on strategic decision making. Having worked in the sector all my life, I don't foresee any technical challenges that are unique to a woman, except that you may need to put in more hours at work thus compromising availability at home.

### **Maize and wheat flour millers regularly accuse AFA of putting unnecessary hurdles on their efforts to bring imports to offset chronic shortages in the local market. How are you addressing these concerns?**

We have automated consignment clearance processes all of which are done online and also deployed crop inspectors at all border points for 24 hours to hasten verification of consignments at the borders.

As AFA, we have four hotlines in place operating 24 hours (0742991670, 0768439940, 0769466418, 0790409435) in case any stakeholder requires urgent support. There is also strict adherence

to Crops Act, 2013 and we hold regular meetings to address emerging concerns as well as implementing the wheat purchase programme that has a remission scheme where millers in the programme enjoy 10 percent duty down from 35 percent.

### **What do you do when not regulating?**

I spend a lot of time with my children, like singing (SDA hymns) and travelling.

### **As AFA's head, what are your plans to take the Authority to the next level?**

As the DG, I want to negotiate for the Authority to be given a board of management and have the human resource instruments approved to ensure the Authority is adequately staffed to facilitate effective delivery of its mandate. I will also ensure that all the necessary resources are available for AFA to perform its functions effectively.

Funds mobilisation for effective performance of the Authority's functions is also part of my plans. In addition, I will ensure there is prudent utilisation of allocated funds. Lastly, I would like to see the establishment of regional offices for effective delivery of services to the public and stakeholders while strengthening the regulatory role of the institution and stakeholder engagement and staff motivation.



*Beatrice Nyamwamu, (center) the Director-General, AFA with staff members from the Food Crops Directorate. Photo Credit: AFA*



*The Solar Panels in Wajir by Solargen that will enable farmers in the region harness solar energy to power their water pumps instead of using costly diesel-powered generators while the drip irrigation will ensure optimal use of water. Photo Credit: Solargen.*

# Solargen's plan to transform Kenya's north through climate-smart agriculture

By Badr Shariff

**N**ORTH Eastern is one of the regions hardest hit by perennial drought and famine in Kenya. The situation has been made worse by the effects of climate change as the region has not received adequate rainfall for the past five years. As a result, the livelihood of the nomadic communities in the area is now threatened, with many abandoning the villages to set up camp in urban centres. The continued rural-urban migration is expected to exacerbate food insecurity in the region unless concerted efforts are made to scale up food production through climate-smart agriculture.

It may not be known to many but the region has great potential for agriculture. Tana River, the longest river in Kenya, cuts right through the middle of Garissa town while Mandera has a seasonal river called Dawa. The areas along the banks of the two rivers are very fertile and can be used for irrigation farming. Though underutilised, the farmers along the two rivers produce some of the sweetest bananas and watermelons in Kenya.

They also grow tomatoes, mangoes, onions and lemons. Wajir on the other hand has a water table that is near the ground surface, making water easily available through the sinking of boreholes and shallow wells.

In spite of the potential, the farmers in the area are currently a frustrated lot, with many contemplating quitting farming. The biggest challenges they face are the high cost of farm inputs and exploitation by middle men who offer them low prices for their produce. The farmers lack the knowledge and the support to employ modern techniques of farming, resulting in crop failures and poor yields. Those who manage to get good harvests sell their produce to aggregators who dictate the prices. The farmers lack refrigeration facilities to preserve their produce to enable them fetch better prices in the market. When it rains elsewhere, especially in the slopes of Mt. Kenya, Tana bursts its banks and floods the entire area under cultivation. The farms become inaccessible and the produce is left to rot in the fields. The area is also infested with parasites that the farmers are unable to control. While the people of the North are not known for farming, these challenges have made farming even more unattractive.

It is against this backdrop that Solargen Technologies Limited, a leading energy, water and irrigation solutions provider, recently set up its regional headquarters in Wajir to offer farmers integrated solutions that comprises irrigation technologies, production planning, training, financing and market linkages. In the pilot phase, Solargen will design and instal solar-powered drip irrigation systems for 40 farmers on Pay As You Go (PAYGO) financing model. The system will enable the farmers harness solar energy to power their water pumps instead of using costly diesel-powered generators while the drip irrigation will ensure optimal use of water.

The pilot phase is targeting farmers with over three acres of arable land and a source of water, either from the river or underground. The farmer selection process is currently ongoing.

Cognizant of the saying; you reap what you sow, the farmers will be supported right from the selection of seeds and fertilisers and in the analysis of soil type and water requirements. Solargen is investing in long-term relationships with reputable suppliers of seeds and fertilisers, allowing it to propose quality and affordable options to the farmers. During the course of the production, the farmers will have access to expert advice by agronomists and extension officers employed by Solargen. The farmers will also be trained on farming best practices to equip them with skills that will make them more resilient in facing their day-to-day challenges. We have set up a model farm adjacent to our Wajir office that will be used by the farmers for benchmarking.

To mitigate the post-harvest challenges of market access, Solargen plans to, in the short term, have agreements with off-takers of horticultural produce such as hotels, restaurants and exporters. However, plans are already underway to build refrigeration facilities in each of the counties to enable farmers preserve their produce and access lucrative local and international markets.

For this plan to bear fruit, Solargen will work with all stakeholders including government, developmental agencies, local leaders and communities. The transformation of northern Kenya into a leading horticultural producer will require the collective effort of every stakeholder. Solargen plans to do its part.

***Badr Shariff is the Managing Director at Solargen.***

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# What can we learn from the current food price shock?

By Dr Timothy Njagi

**T**HE year 2022 has seen food prices rise to an unprecedented level in Kenya's history. At the start of the year, citizens expressed the frustration of rising food inflation as prices of key items such as maize flour, wheat flour, cooking oil and vegetables rose. Prices started rising during the last quarter of 2021 and have continued to rise through 2022, triggering the government to temporarily implement subsidy programmes targeting maize in July and August. The government announced duty waivers for maize from July 1, followed by a maize flour subsidy that reduced the price of maize flour by 50 percent.

Food inflation has risen on average by 12 percent in 2022 compared to the same months in 2021, according to Kenya National Bureau of Statistics (KNBS) data. The highest increase was experienced in June when the price of maize flour, beef and cooking oil rose to an all-time high.

The rise in food prices has been attributed to a number of factors. First, the government increased excise duty on most commonly used household goods such as cooking gas and fuel from November 1, 2021 through inflation adjustment to the excise tax. The tax increases were attributed to the deal Kenya signed to secure loans from the International Monetary Fund (IMF) as part of the pandemic relief interventions. Second, the rising prices have also been attributed to global supply chain disruptions that have increased the costs of importation. Kenya is a net importer of food. Domestically, production shocks due to adverse weather and rising costs of transport are seen as key contributors



*A customer shopping for cooking oil in a supermarket.  
Photo Credit: The Standard*

to the rising food prices. Third, the effects of the Russian invasion of Ukraine triggered a global food price shock as the two countries are bread baskets for Europe.

Even as this debate rages, it is important to highlight key issues on the effect and causes of the current problem. First, poor households bear the brunt of rising food costs. According to data from the KNBS, food accounts for 54 percent of Kenyans' household expenditure on average. Those in rural areas spend 65 percent. Also, an average of 68 percent of food is purchased by households, with those in urban areas purchasing 85 percent of what they consume. Second, Northern Kenya and other arid lands in Kenya are facing a drought affecting the Horn of Africa. By August 2022, 4.3 million Kenyans across 20 counties were in need of food assistance. Already, there are rising numbers of

children reported to be malnourished in seven counties that are worst affected by the drought.

The outlook for the country and affordable food prices given the status quo is pessimistic. Last year, livestock farmers were hit hard by rising costs of animal feeds in the country. The rising cost of animal feeds was attributed to shortages in raw materials such as soya in the global markets due to the effects of the pandemic. Kenya imports most of the raw materials for animal feed manufacturing. Unfortunately, most farmers were driven out of business because they could not compete with cheap imports from neighbouring countries. To protect local producers, the government imposed a tariff on some of the products. However, this adversely affected consumers. The tariff was lifted in December 2021. The government announced a duty waiver on raw materials for animal feeds, but rising global prices mean that the expected effect in reducing local prices for animal

feeds has not been realised. On the other hand, fertiliser prices rose by 70 percent from those during the main planting season time last year. The rise, which started in 2021, was mainly attributed to supply chain disruptions due to the pandemic. The Russian invasion of Ukraine has further complicated matters pertaining to food security and prices for Kenya. In 2020, Russia accounted for 17 percent of fertiliser imports to the country. Also, Russia was the leading exporter of wheat to Kenya, accounting for almost one-third (32 percent) of wheat imports to the country. Ukraine accounted for 94 percent of soya imports as well as contributing to wheat (2.0 percent) and maize (3.0 percent) imports. The price of fuel is expected to go up as a result of this crisis.

The government responded by announcing a fertiliser subsidy in June. However, this was too late as the season had long gone. In July, the government announced a subsidy on maize flour. Both subsidies are not likely to have a meaningful impact on alleviating the food insecurity. Firstly, farmers incurred very high costs of production, and are expecting higher prices for their output to recover their costs. Had the fertiliser subsidy been announced in March, this would have alleviated the costs for farmers and helped lower the price. Alternately, the government could also have considered a duty waiver on fertiliser from December 2021 for similar results. It is likely that these alternatives would be cheaper than the food subsidy. Another criticism of the food subsidy is that by focusing on maize, the government contradicts itself on messaging on food security. The government has been pushing for diversification of diets and reduction in the reliance on maize. As both policies focus on maize, the message is for farmers to also concentrate on maize due to the policy support given to the value chain.

The debate on high food prices is not new in Kenya. The potential solutions for sustainably growing local production and ensuring stable and affordable food prices are also not novel.

Although the government has made efforts to implement some of these potential solutions, overall, we are still far way off from where the country ought to be.

First, the government needs to enhance the availability of credible data on food availability. This has been lacking, or when available it is not credible. For example, early in the year, millers claimed maize shortage was the reason behind the rising cost of maize flour. Farmers refuted this claim pointing to local availability for maize. Credible data is very useful to have right and impactful policies.

Second, the government can review some of the policies currently in place to avert potential crisis. For example, the total ban on GM products means that Kenya struggles to replace countries such as Russia or Ukraine in supply of wheat and soya as most of the leading producers in the world produce GM products. This policy also prevents the lowering of animal feed prices, which can lead to increased local production of animal products. This policy waiver should definitely be considered even as a short-term measure.

Third, the national government and county governments must put more emphasis on growing agricultural productivity. A starting point is the revamping of extension and advisory systems to provide farmers with the necessary knowledge and information on how to improve their yields. Beyond improving yields, there is need for public sector investments to enhance the infrastructure for post-harvest storage and management.

Finally, the government must review the trade policies to be more strategic especially on key staples. For example, trade deals to secure grain from EAC or COMESA should have been negotiated as early as May as it was clear that the country was likely to have a deficit in production. Early deals are likely to secure more value and reduce speculation in the markets.

**Dr Timothy Njagi is a Development Economist and Research Fellow at Tegemeo Institute of Agricultural Policy and Development.**



*A fruits vendor selling fruits on the street of a town in Kenya.  
Photo Credit: The Star*



*On the Left : Dr J d'A Hughes, Director General, ICRISAT and Director Administration at the state department of ASAL Kennedy Kimuyu viewing some of the technologies and value addition done by farmers growing traditional crops, during ICRISAT 50 years celebration. Photo Credit: Marion Wagaki*

# Sorghum, millet demand rises on flour blending plan

By Marion Wagaki

**G**ROWING traditional crops, famed for their high nutritive value, climate resilience and low-input demand, is highly recommended by agricultural experts as a solution to food and nutrition insecurity among farming communities in Africa.

“Traditional crops such as millet, sorghum and even TEFF still are a part of the diets of many communities in Africa, they are highly nutritious and there has been rising demand for them despite the

wheat, maize and rice dominating our farms and plates,” said Dr J d'A Hughes, Director General, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

In Kenya, the Ministry of Agriculture has been pushing millers to blend maize and wheat flour with sorghum, millet and cassava to improve nutritive value and farmers' earnings.

The government in 2018 drafted guidelines and standards governing the blending of maize and wheat

flour by millers to strengthen the nutritional components of the products.

The policy is yet to come through, but experts say its impact on food and nutrition security will be enormous.

Dr Eric Manyasa, a crop breeder from ICRISAT, said a flour blending policy will also come with a need to produce big volumes of sorghum and millet and that industry players should be well prepared for the increased demand.

"We need as stakeholders and scientists to move with speed to produce the right materials, the right varieties adapted to the right agro-ecological areas so that when the policy is rolled out we shall be able to produce the right required volumes of the grains to be able to run the blending system," Dr Manyasa told members of a consortium of small grains seed industry players from East and Southern Africa (ESA) during a recent field day at KALRO's Kiboko station.

The field day was organised to showcase to the partners who came from Zimbabwe, Sudan, Ethiopia, Tanzania, Uganda and also India the new parents that have been developed by KALRO and ICRISAT.

Kenya's average national sorghum yield is about 0.7 tonnes per hectare but it has the potential to produce 4-5 tonnes.

Dr. Manyasa said that the increased use of sorghum by industrial processors has led to high demand for the grain but there is need to build a value chain that is profitable to all actors.

"How can we join the dots and break the myth that farmers cannot adopt new sorghum varieties? Farmers will invest where there is return on investment and therefore the various actors should create opportunities along the value chain for farmers to sustain the production," he said.

He cited the example of a hybrid sorghum variety developed by Egerton University and embraced by Kenya Breweries for its good malting qualities but whose rollout has been delayed by constraints in the seed system.

The brewer alone, he said, currently needs between 40,000 and 50,000 tons of sorghum grain a year.

Kenya produces between 250,000 tons and 300,000 tons of sorghum annually.

"In the region, we are also a paltry small producer of sorghum if we compare with Sudan which does six million hectares, Ethiopia has about two million hectares, Tanzania 750,000 hectares and these are large players where much of the sorghum is not for industry but for food," he said

Zubeir Ibrahim Mohamed from Sudan's Nile Sun Company, which produces seeds for sorghum, said that although they grow a lot of sorghum in his country, he was looking for the high-yielding varieties developed in Kenya.

In Sudan, he said, sorghum is mainly used for feed and food and is also blended with wheat flour for bread making.

He noted that although they produce sorghum in over six million acres, the national average is low at about 0.2- 2.3 tonnes per acre.

An improved breed they got them from Kenya last year is yielding 1.5 tonnes per acre.

"The hybrid has more potential but if we increase the area and improve varieties, this 0.2 ton can go up to 0.7 and it is a huge increase," Ibrahim said

According to the seed consortium members there is a lot of interest that has been shown in the past five years by the private sector not only in Kenya but across East and Southern Africa.



**Eric Manyasa a crop breeder from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) during a field day in Kalro – Kiboko. Photo Credit: Marion Wagaki**



*A farmer inspects his quality seed multiplication crops on his farm in South Sudan. Photo Credit: Panagri Media Reporter*

# Seeds, value addition equipment lift for former refugees

By Panagri Media Correspondent

**M**ORE than 20,000 farmers, a majority of them former internally displaced persons (IDPs) and refugees, will receive quality seeds and value addition or post-harvest handling equipment under a project aimed at improving farm productivity, household incomes and access to markets.

The five-year project launched in 2021 is funded by the African Development Bank to the tune of \$14 million and is being implemented by the United Nations Food and Agriculture

Organization, and South Sudan's Ministry of Agriculture and Ministry of Trade.

"The farmers in South Sudan have a big challenge of quality seeds and when they get, they do not come on time," said Sebudaka Hannington, the Agricultural Markets, Value Addition and Trade Development (AMVAT) project manager at FAO.

"While we are working to improve their seeds, the project also provides them with value addition and post-harvest handling equipment of their produce."

The African Development Bank says enhancing agricultural productivity and boosting the marketing and trade of agricultural products in South Sudan will help increase the incomes of farming families, most of whom have now returned to their homes after being displaced by conflict.

"The project will create aggregation business opportunities for farmers and traders, including women and youth, and provide them with new skills and the agro-processing equipment they need to produce competitive products," the bank notes on its website.

Twenty aggregation business centres will serve as 'one-stop shops' where farmers can access extension services and connect to markets for their value-added products.

Farmer groups joining the aggregation centres will have their products not only tested and quality certified, but also traded with the private sector on their behalf.

The aggregation business centres will be complemented by 10 seed enterprise groups providing improved seeds to 100 business producer associations.

South Sudan has considerable unrealised agricultural potential, but the effects of conflict combined with flooding have held back food production, resulting in a huge food import bill.

#### **Food deficit**

The latest conflict which began in 2013 left 400,000 people dead, displaced four million others, slashed the production of crude oil -- the East African nation's main revenue source -- and led to economic chaos.

Despite the implementation of a peace deal in the country, 7.74 million people were projected to be food insecure in mid-2022.

The findings of the 2021 FAO/WFP Crop and Food Security Assessment Mission (CFSAM) estimated the aggregate cereal production in the country at about 840,000 tonnes, which is 4.0 percent down from the 2020 output, and well below the pre-conflict levels.

The findings published in July said the year-on-year decrease in cereal production is mainly driven by reduced yields due to widespread floods and prolonged dry spells.

It said the overall cereal deficit in the 2022 marketing year (January/December) is estimated at about 541,000 tonnes, about 16 percent above the near average deficit estimated in 2021.

FAO noted that for a land-locked country such as South Sudan experiencing weak urban and peri-urban infrastructure, good access to markets is a necessary condition for farming to be profitable and to reduce risk of loss of surplus farm produce.

Agricultural and food products struggle to find their way to international markets partly due to the lack of adequate food quality controls.

#### **Safeguarding food security**

The AMVAT project therefore seeks to ensure quality food production with globally recognised safety and standards, and more yields for consumption and export, Hannington said.

Being undertaken in Central Equatoria State, Eastern Equatoria and Jonglei, the AMVAT project is working with 100 farmer cooperatives and has reached 7,000 small holder farmers in five counties.

It is already benefiting 224 farmer groups out of a targeted 667, he said.

"Food quality productivity is very key and as such this project is providing foundation seeds and skills to multiply them to the farmers," Hannington said.

"The agriculture sector becomes very competitive by increasing productivity through value addition. Once the market access is guaranteed, skills of the farmers are improved and high standards of production realised, there will be a high increase in income," he concluded.



*A farmer on a sorghum plantation: Photo Credit: ICRISAT.*



APHRC staff planting fruit trees at Comboni primary school, Korogocho, Nairobi. Photo Credit: Henry Owino

# APHRC targets zero hunger with fruit trees in schools

By Henry Owino

**W**HILE conducting a study on household food security in informal urban settlements in 2004, researchers from African Population and Health Research Center (APHRC) were shocked at the large number of children they found going to school hungry.

"The children were telling us they had not eaten for two or three days and could not comprehend class lessons. Most of them were dosing or sleeping in class while lessons were

on yet a few could not go to school at all," recalls Elizabeth Kimani-Murage, Senior Research Scientist, Head of Maternal and Child Wellbeing Unit at APHRC.

"So, we said we cannot sit back and wait, we must do something to ensure that no woman is cooking stones for her children, or nobody is sleeping on an empty stomach for days."

That experience inspired APHRC's Zero Hunger Initiative, which promotes the growing of fruit trees in schools and public urban spaces as a way of fighting malnutrition.

Dr. Catherine Kyobutungi, the Executive Director of APHRC, said the programme is part of the organisation's research implementation that aims to make food systems in 10 cities across six African countries more sustainable, equitable and resilient.

"We are making most out of the limited urban spaces for food production. We are free to partner with like-minded organisations to achieve Zero Hunger Initiative which is number two among the 17 SDGs," Dr. Kyobutungi said.



**Dr Catherine Kyobutungi, APHRC Director having a chat with Esther Passaris, Nairobi Woman Representative. Photo Credit: Henry Owino**

The first 50 fruit trees were planted at Daniel Comboni Primary School in Nairobi's Korogocho slums. Most of the fruit trees planted were grafted mango trees. Grafted mangoes take a shorter time to mature -- three to five years to produce its first fruits.

Mangoes are also an excellent source of potassium, folate, fibre, and vitamins A, C, B6, E, and K and are rich in numerous plant polyphenols that have antioxidant and anti-inflammatory properties.

But mangoes and other fruits are expensive and most parents in informal urban settlements cannot afford them.

Under Zero Hunger Initiative, parents are encouraged to plant fruit trees in their local schools and public spaces to support nutrition programmes in the learning institutions.

In Nairobi, the Zero initiative targets public urban schools, especially those in informal settlements where malnutrition prevalence is high.

Dr Kyobutungi said the plan is to roll out to other parts of the country

once all public primary schools are covered and public spaces in Nairobi exhausted.

"Each grafted fruit tree planted in the schools will provide between

300 and 500 organic fruits that will support school feeding and nutrition programmes. The fruit trees will also make the schools green," Dr Kyobutungi said.

The programme is emphasising the message that when you grow fruit trees today for healthier food, you secure tomorrow by ensuring a sustainable environment for future generations as well.

The programme has won praise from the city's political leadership, with Nairobi Woman Representative Esther Passaris highlighting its contribution to efforts to guarantee the constitutional right to safe and quality food.

"Most of the leafy greens eaten in Nairobi are grown near rivers whose waters are polluted with sewer lines and other effluent affects vegetables and could cause diseases to consumers," Ms Passaris said.



**Dr. Kimani-Murage planting a mango tree at Comboni primary school, Korogocho, Nairobi. Photo Credit: Henry Owino.**

*GLOBALG.A.P. developed an add-on for sustainable water management at the farm level better known as Sustainable Program for Irrigation and Groundwater Use (SPRING). Photo Credit: Shutterstock*

# Improving the use of freshwater resources on farms

By GLOBALG.A.P. Team

**S**EVENTY percent of the world's freshwater resources are used for agriculture. As the strain on this limited resource intensifies and ecological problems arise – particularly in arid regions – agricultural supply chains are now under more pressure than ever to mitigate the problem. Accordingly, food system stakeholders are now frequently expected to provide evidence documenting their efforts to manage water risks, disengage from illegal water extraction and promote sustainable on-farm practices.

To help tackle this issue, Coop – a Swiss retail company and pioneer in sustainability – joined forces with GLOBALG.A.P. to develop an

add-on for sustainable water management at the farm level: Sustainable Program for Irrigation and Groundwater Use (SPRING). In 2018, Coop began to purchase products from the first SPRING-assessed producers and in 2019, GLOBALG.A.P. officially launched SPRING as an add-on.

SPRING is an on-farm assessment and can be carried out together with the GLOBALG.A.P. Integrated Farm Assurance standard for Crops and with the Crops for Processing standard. The assessment incorporates a wide range of criteria which address sustainable water management practices on the farm and can help producers,

retailers, and traders demonstrate their commitment to sustainable water management. The SPRING assessment includes parameters such as: legal conformity of water sources and extraction rates, monitoring of water consumption, impact of producers on sustainable watershed management and best practices in water management

Producers who successfully implement the SPRING add-on receive a certificate of conformity, which is also visible in the GLOBALG.A.P. database. Authorised supply chain stakeholders can also access the full audit report as a "SPRING observer" via the GLOBALG.A.P. database.



**GLOBAL.G.A.P. is committed to protecting water on a sustainable basis as it is a natural and essential resource. Photo Credit: Shutterstock**

In South Africa there are currently about 2,500 producers under GLOBAL.G.A.P. certification. The main products under GLOBAL.G.A.P. certification in South Africa are lemons, oranges, mandarins, pears, and apples. More than 300 producers have already recognised the need to improve their use of freshwater resources on their farms and have completed a SPRING assessment. These producers profit from a more sustainable approach to water management and play their part in protecting water sources. This is an important approach that more and more producers will follow in future.

#### **What water means to GLOBAL.G.A.P.**

Public awareness of the need to conserve water is growing. Accordingly, water risks in primary agriculture are receiving increasing attention from consumers, media, and civil society. As pressure on this limited resource grows, many farmers are choosing to implement GLOBAL.G.A.P.'s SPRING.

#### **What water means to SPRING-assessed producers**

GLOBAL.G.A.P. interviewed a SPRING-assessed producer from Jujuy Province, Argentina, who produces grapefruits, lemons and oranges.

#### **What does water mean to you?**

"On our farm, water is more than a resource to irrigate our products. It means life, growth, and responsibility of use."

#### **How is it important to your farm and your daily life?**

"It is a natural and essential resource, and we are committed to protecting it on a sustainable basis, the best way we can."

#### **How has the SPRING add-on helped you with sustainable water management on the farm?**

"It has been very helpful so far. At Quinta Yuchán, we think GLOBAL.G.A.P.'s SPRING add-on is an excellent way for a farmer to promote innovation and continuous improvement in sustainable water management. It is a real commitment to the use of a scarce resource."

***María del Milagro Solá Torino, Head of Research and Quality Management Dept. Fruit and Juice Management Quinta Yuchán, GGN 7791762000003.***



***An illustration of a rainwater fed crop. Photo Credit: Shutterstock***

# Alternative sources of protein

**T**HE National Drought Management Authority (NDMA) in Kenya, in a recent report, said over 940,000 children risked death due to malnutrition resulting from food scarcity caused by prolonged drought in some four counties. The report further states that at least 134,000 pregnant or lactating women in the said counties; Marsabit, Turkana, Wajir and Mandera alone are "acutely malnourished", creating need not only for food, but also medical attention. Data released in April 2022 by the United Nations Children's Fund (UNICEF), shows the number of children faced with similar problems in the Horn of Africa was 10 million, with Ethiopia, Kenya and Tanzania alone accounting for nearly 2 million. One of the causes of malnutrition especially in children is due to lack of enough proteins in the body from the food they consume. There are alternative sources of proteins which include edible insects that if explored and given a space in mainstream diets, could play a role in tackling malnutrition.



**Dried caterpillars sold in the Nsan market, Yaounde**

**Photo Credit: Elias Ngalame**



**Edible cricket. Photo Credit: FAO**



**A woman selling dried caterpillars in Kinshasha, Democratic Republic of the Congo. Photo Credit: FAO**



**Edible bugs. Photo Credit: NYC Food Policy**



**Fried termites  
Photo Credit: NewsMinute**



**Insect-based protein for poultry**  
Photo Credit: Poultry World



**Termites**  
Photo Credit: Malindi Kenya



**Insect-based protein**  
Photo Credit: News Agency



**A students and a teacher showcasing maggots**  
Photo Credit: Lominda Afedraru



**Fried and grilled snails**  
Photo Credit: Morning Fresh



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# GRASP

GLOBALG.A.P. Risk Assessment on Social Practice





(L-R) Tonny Omwonsa, the CEO Kenya National Innovation Agency (KENIA), Optimerce founder John Waweru, Heifer International Kenya Country Director Esta Kamau, Grace Kyarimpa, Managing Director of Agrodive Ltd, Kenya and a representative of Rafiki Pay during the award ceremony held in Nairobi.

Photo Credit: Francis Mwangi/Heifer International.

# Agri-tech firms win Heifer cash grants for innovation

By Murimi Gitari

**T**HREE winners of a Heifer International-backed award for agri-tech innovation will receive cash grants of up to \$20,000 and training on a three-month mentorship programme.

The Agriculture, Youth and Technology (AYuTe) Kenya Challenge recognises the most promising young agri-tech innovators across the country.

Optimerce Consulting, a business that digitises the process of produce collection at farm-gate through mobile apps, was named the winner of the competition, who got a cash grant of Ksh 1 million.

RafikiPay a company that deals with the processing of sunflower, groundnuts, soya and canola oil from the hybrid seeds, emerged as the first runner-up, winning a cash grant of Ksh500,000.

The second runner-up Agrodive Ltd Kenya walked away with Ksh250,000.

Agrodive converts insects, earthworms into sources of protein in animal feed and high-quality organic fertilisers.

Heifer International introduced the award to promote affordable solutions in line with its goal of helping more than six million smallholder farmers in Africa to earn a sustainable living income.

The Kenyan award winners were chosen from a field of young agri-tech innovators from across the country and were announced during Heifer's gala awards ceremony held in Nairobi early September.

A company must have developed a tech solution to address smallholder farmer challenges with strong potential to scale to be considered for the award.

Other finalists were Azma Foods Ltd, Digital Farmer, Ento (insects) Solutions Ltd, Farm Mall, Farmerline Technologies, Limachain, Nalima Digital, Shambaline Ltd, Soluvax, Stofresh Africa, Toothpick Company Ltd and Vermi-Farms Initiative Ltd.

Heifer International Kenya launched the AYuTe Africa Challenge Kenya in June to promote and reward agriculture technology innovation across different agricultural value chains in the country.

The top 15 finalists were competitively selected through a rigorous judging process and got a chance to do their final pitching where three winners were selected.

Speaking at the gala ceremony, Heifer International Kenya Country Director Esta Kamau affirmed the organisation's support to the winners.



**The 15 young agritech innovators and finalists of the AYuTe Africa Challenge Kenya with certificates they received from Heifer International Kenya during the award ceremony in Nairobi.**

**Photo Credit: Francis Mwangi/Heifer International.**

"Having worked with farmers for very many years we see the AYuTe Challenge as an opportunity to identify exciting young innovators who have wonderful ideas to be able to walk with them through the journey of fine-tuning those ideas as well as providing linkage to the opportunities to scale up those ideas," said Ms Kamau.

She noted that the competition has affirmed the organisation's belief that many young tech companies require a combination of significant investment and expert guidance. "I am confident that we have filled that need, not just for the top three winners but also for those who made it to the top 80," she said.

The much bigger AYuTe Africa Challenge award, launched in 2021, gives grants annually of up to US\$1.5 million to the most promising young agri-tech innovators on the continent.

In the same year, two companies, Hello Tractor and Coldhubs Kenyan and Nigeria-based companies respectively won US\$1.5 million for being at the forefront of driving youth engagement in agriculture.

Heifer International says it conceived the idea for AYuTe Africa Challenge based on four decades working with

African farmers and seeing first-hand the stark difference between local farms that have access to technologies and those that do not.

Speaking after receiving the award, Optimerce founder John Waweru thanked Heifer International Kenya for recognising and supporting youth who have ventured into innovations meant to help smallholder farmers.

"This award means much more to me than just the Ksh1 million as my business model was birthed out of a tragedy that had happened in our family," he said, adding a word of encouragement to the other contestants.



**John Waweru, the Founder and CEO of Optimerce Consulting Ltd, the winner of AYuTe Africa Challenge Kenya receiving a dummy cheque from Tonny Omwonsa, the Kenya National Innovation Agency CEO. Photo Credit: Francis Mwangi/Heifer International.**

"It is not only me who is getting to the top but each and every one of us. And now we have been tasked to go out and ensure the technologies we have developed will give our farmers more profit and help them prepare their children, who will be the next generation [of farmers], to embrace, and not dislike, agriculture."

David Cheboryot, the director of the business accelerator E4Impact Entrepreneurship Centers, said the innovators on the programme had been prepared well to create impact in their communities.

"As E4Impact we were glad to have been involved by Heifer International Kenya to provide capacity building, training and mentoring of the young agri-tech innovators in the various stages of the competition on the art of storytelling to better connect the problem and the unique value they were providing, how to dissect and validate their markets, defend their revenue streams, document, quantify and share on their socio-environmental impact and justify their financial request which the finalist and the winners managed to do," he said.



**KENYA AGRICULTURAL & LIVESTOCK RESEARCH ORGANISATION**

## **KALRO NARL - Kabete**

(Off Waiyaki way, between Nairobi school and Kenya Defence Force barracks)

# **FIELD DAY**

### **Theme:**

Exhibition of Technologies, Innovations and  
Management Practices for Increased and Sustainable  
Food and Nutrition Security

### **When:**

**9<sup>th</sup> and 10<sup>th</sup> December, 2022**

### **Entry:**

**Free**

# **WELCOME**

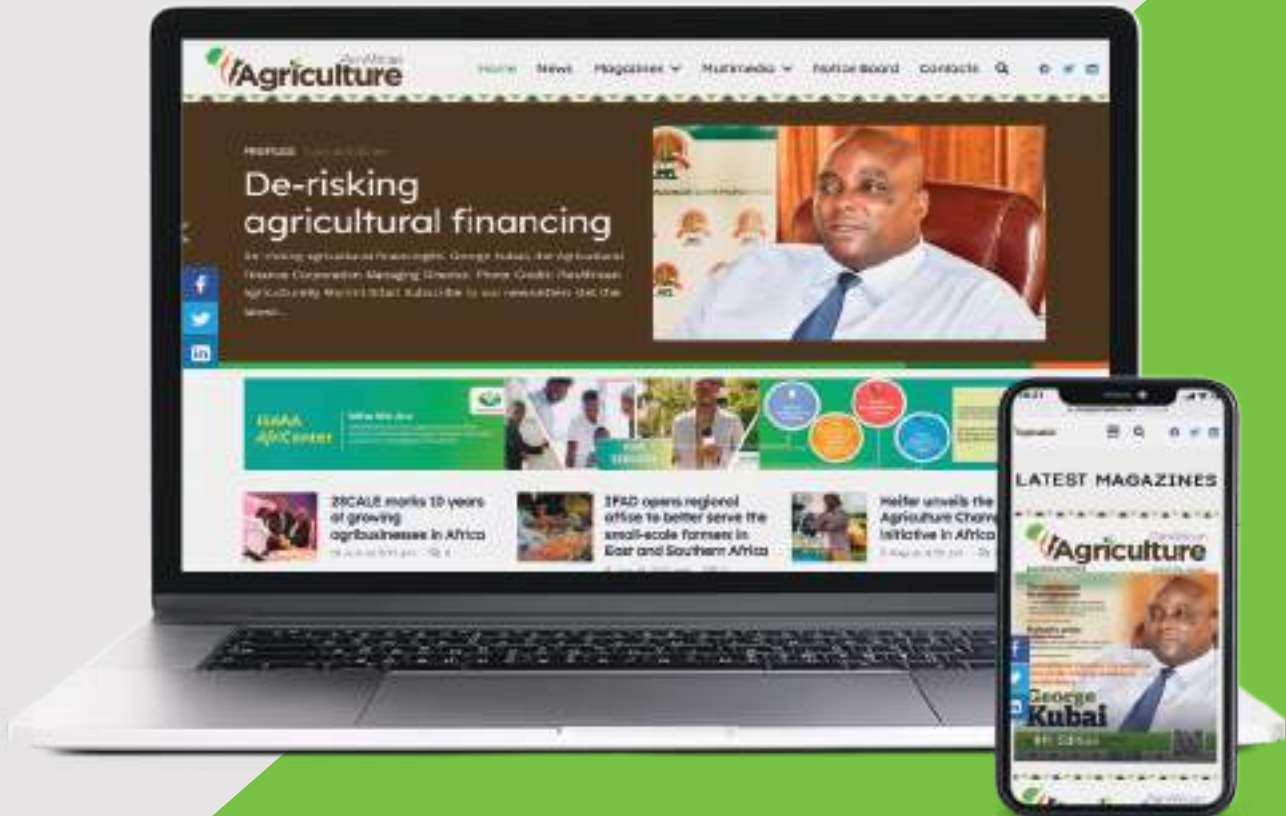


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