

GENDER SENSITIVE ADVISORY SERVICES 4





**Smallholder farmers** are affected by the investment gap in agri-SMEs operating in sub-Saharan Africa (Credit: CABI).

STEPPING UP PLANT DOCTOR TRAINING 6





## USD 106bn finance gap in agricultural business

The Commercial Agriculture for Smallholders and Agribusiness (CASA) programme has published '<u>The state of the agri-SME sector – Bridging the</u> finance gap.'

The report estimates demand for financing, from around 220,000 agri-business SMEs in sub Saharan Africa and Southeast Asia at \$160bn with banks, impact investors and other financial intermediaries providing only \$54bn. Furthermore, almost all climate funding is targeted at mitigation measures, rather than supporting ways for agriculture to adapt to the climate crisis with less than 2% of global climate finance – or \$10bn – being channelled to small-scale agriculture.

The market is characterized by a small group of high-potential SMEs at the top served by private equity, a much larger set of relatively mature companies in the middle financed by banks and a bottom of the market of lower performing companies that are reached by highly concessional finance providers, if at all. Most of the market is for sub-commercial capital and even in the longer term most agri-SMEs will never be in a position to access fully commercial capital.

The state of the agri-SME sector report from CASA also declares that accepted challenges include high costs to serve agri-SMEs, high perceptions of risk in agricultural markets and low levels of investment readiness amongst potential

### **KNOWLEDGE FOR LIFE**

borrowers and the high costs for borrowers to service these loans.

Furthermore, the document outlines a new level of granularity to the market for agri-SME finance in sub-Saharan Africa and Southeast Asia, highlighting the USD 106 billion annual financing gap.

The report adds that even if funds were made available to build resilient supply chains and support climate adaptation, the infrastructure is not currently available to channel the finance to where it is needed.

To address this issue, four change priority areas are outlined in the report. These are the need to:

- Support both the enabling environment for loans and providing support for agri-SMEs to make them investment-ready
- Support local banks over time to profitably serve

smaller, less commercial agri-SMEs with long-term, subsidised capital

- Make better use of impact investment from public and philanthropic sources
- Create suitable investment infrastructure to deliver climate funds at scale

The report calls for a more coordinated approach to ensure that whatever sub-commercial finance is available is applied to the best candidates among agri-SMEs. CASA stands ready to work with our partners and other interested parties to help make better use of subsidies, mobilize existing local financial institutions, and increase the availability of climate finance for the investment pipeline.

Borris Akiri: africa@cabi.org

### **Consumer food safety perceptions, Kenya**



#### Food safety and PlantwisePlus

Foodborne diseases result from the consumption of food that contains contaminants such as viruses, bacteria, parasites, chemical hazards, veterinary drugs (antibiotics), mycotoxins, and allergens. As such, addressing food safety issues and the governance of emerging technologies are inescapably and dynamically intertwined.

CABI's new global PlantwisePlus programme hopes to drive demand for higher quality food by highlighting issues related to unsafe food, particularly hazardous pesticide use, in food production. This shift in demand will encourage farmers to use low-risk farming practices, which will allow local consumers to gain access to safer, healthier produce.

#### Food safety survey

As part of the PlantwisePlus programme, a consumer food safety survey was recently conducted in Kenya. The study's aim was to better understand consumers' knowledge, judgments, and practices related to food safety.

Recognising consumers' knowledge, judgment and practices around food safety are essential to developing and implementing food safety policies. In addition, understanding consumer perceptions allows risk communication strategies to be created that address the food safety problem areas.

#### Survey's focus

The survey focused on fruit and vegetable and looked at the domestic market food supply system. The study area covered regions that are important production areas for fruit and vegetables in the country, and those representing a high concentration of consumers.

The vast majority of survey respondents shopped at local, open-air markets, with the most important deciding factor being proximity to their home or workplace. Price was the second most significant reason for selecting where to buy produce. Only a few consumers gave vendor trustworthiness, a clean environment and organic produce as a reason.

#### Supply chain and food safety

As part of the survey, growers were asked about their farming practices. Most of the respondents said that they used pesticides to control pests and that usage was based on their own knowledge and experience as well as recommendations from agro-dealers. This justifies consumer concerns about pesticide risks in their food.

#### Consumer awareness

The survey showed that consumers are aware of what they can personally do to reduce risks in the food they eat, for example, thorough cleaning before cooking. They are also aware of the risks at producer and market level, which are beyond their control.

**Omega Kansiime**: m.kansiime@cabi.org

## Digital tool to fight armoured bush cricket wins Atos Digitize Rural-Agriculture Challenge



**Armoured bush cricket** and its damage to maize (Credit: Tibonge Mfune and Léna Durocher-Granger)

The concept for a digital tool to fight devastating armoured bush cricket outbreaks in Southern Africa – which has been led by a team of CABI and Ministry of Agriculture of Zambia scientists and researchers – has won the Atos Digitize Rural-Agriculture Challenge.

The challenge was part of the Innovate2030-SDG11 Innovation Program that seeks to collaborate with smallholder farmers to boost their productivity through digital solutions that support innovative farming in Africa.

It is hoped funders will now be attracted to back the Armoured Bush Cricket app which will help smallholder farmers in Southern Africa achieve greater food security and increase their livelihoods within their farming communities. example, farmers in Siavonga losing between 70-100% of their crops. Affected crops include sorghum, millet, pumpkins, cowpeas and cucumbers.

Léna Durocher-Granger and her colleagues are now hoping that winning the challenge will be a springboard for their app design to be developed further and launched as part of farmers' Integrated Pest Management plans.

The judges were impressed with the concept for the app that takes a four-step approach as a key decisionmaking and communication tool that can be used by extension officers, government scientists and Nongovernmental Organisations (NGOs).

The four key features of the app include data collection, distribution map, management section and feedback bank. Once combining field and earth observation data to produce the pest model, the digital tool will be able to forecast information related to armoured bush crickets such as its emergence and life stages.

Infestation level and distribution in real-time will enable timely and targeted actions for control. Long-term management is fundamental to this pest problem as season by season control has failed. Strategies include agroforestry, intercropping and the use of entomopathogenic fungus.



Noah Phiri: n.phiri@cabi.org

The armoured bush cricket is a major pest with, for

# Supporting gender-sensitive rural advisory services in Ghana



Attendees of the training of trainers workshop on gender-sensitive rural advisory services held in Ghana (Credit: CABI)

CABI, as part of its global PlantwisePlus programme, has held a training workshop in Ghana aimed at building the capacity of the country's regional agricultural officers to deliver advisory services which are mindful of the sensitivities of gender differences.

The training in Kumasi – which was led by Bethel Terefe, CABI's Gender Coordinator – included officers responsible for plant protection and regulatory services, extension services and women in agricultural development from different regions.

#### Gender gaps and productivity

CABI's work within the Plantwise programme in Ghana over the last five years has shown that women farmers have limited access to extension advisory services, including plant health services due to various challenges. This often contributes to a gender gap in agricultural productivity, which, if closed can help boost agriculture production and improve the welfare of rural households.

#### Concepts of gender equality

Ms Terefe guided participants through basic gender concepts, gender equality and general perceptions about gender issues in society and why understanding these issues matter in the work of rural advisory service providers.

In order to build their capacity to overcome these limitations and to deliver gender-sensitive agricultural advisory services, the participants were also trained on how to use simple gender analysis tools. This is to ensure that the particular needs of men and women are well catered for in agricultural advisory planning and delivery.

#### Tailoring messages appropriately

Ms Terefe said these tools help to understand which member of the household is in charge of a given activity at a given time in the day or season. This helps the extensionist to plan their schedules and tailor messages appropriately to meet the specific needs of the different gender groups within the household.

Naa Oyoe Quartey, Deputy Director of the Women in Agricultural Development (WIAD) Directorate of the Ministry of Food and Agriculture, said the training provided commendable initiative as it has equipped participants with essential knowledge and skills they need in order to make their service delivery gendersensitive.

WIAD would like to call for more collaboration in the coming months to extend this training to officers and rural advisory delivery agents in the remaining regions of the country," she added.



Solomon Duah: s.duah@cabi.org

### Forecasting models targeting Fall **Armyworm larval stages created**



A CABI-led study has developed the first forecasting models targeting the larval stages of fall armyworm using near real-time earth observation data and pest occurrence within a farmers field. The models will assist in the fight against the devastating fall armyworm (FAW) pest which in Africa alone is estimated to cause annual yield losses of USD \$9.4 billion.

New research conducted by an international team, led by researcher Alyssa Lowry, has demonstrated how the models developed for FAW larval populations in Africa can help smallholder farmers more accurately predict the best time for making a management intervention on their crops to prevent damage.

The study, published in the journal Crop Protection and with support from colleagues from the Kenya Agricultural and Livestock Research Organisation (KALRO) and the Zambia Agriculture Research Institute (ZARI), built two larval population emergence models based upon field FAW data from maize in Zambia. The

models were then validated using similar data from multiple maize sites in Kenya.

The novel modelling of early and later instar larval population emergence and development, now allows alerts to be sent to farmers in advance of an intervention/scouting time, allowing farmers to take preventative action.

Ms Lowry and her colleagues highlight how this modelling has already paid dividends as part of the CABI-led Pest Risk Information Service (PRISE) which provides real-time alerts - via SMS messaging - to farmers advising them when to act to protect their crops from pests.

At the end of the 2019/2020 short rains season in Kenya, for example, a separate survey revealed that 59% of farmers – that received the forecasting service - changed their practices for dealing with FAW and further resulted in a reduced population of FAW and an increase in maize harvest.

Emmanuel Bakirdjian, Africa Regional Director, Precision Development (PxD), a partner in the research, said, "Through our partnership with CABI, the information from PRISE has helped nearly 100,000 farmers on the PxD-run MoA-INFO service to learn when pesticides are most likely to be effective."



Noah Phiri: n.phiri@cabi.org

## **CEO visits CABI Africa as part of Africa Regional Consultations**

Welcome to this issue of the CABI in Africa Newsletter where we bring you a selection of recent news and stories from our work in Africa.

CABI CEO Dr Daniel Elger recently visited the CABI Africa regional office in Nairobi, Kenya and held discussions with in-country partners as part of the Africa Regional Consultations..

Dr Eliud Kireger, Director General, Kenya Agricultural and Livestock Research Organization (KALRO) and CABI's Liaison Officer for Kenya, appreciated the longlasting partnership that has seen the successful implementation of numerous programmes and projects in the country. Dr Elger expressed the valuable contributions from Kenya and outlined how the country's input in the Africa Regional Consultations will greatly help shape CABI's next global Medium-Term Strategy for 2023-2025.

At the KALRO Muguga research station, ongoing classical biological control experiments on papaya mealybug using a parasitoid were showcased. CABI is working with KEPHIS and KALRO and farmers along the Kenyan coast to roll out a coordinated release of the Encyrtid wasp. The CEO was also briefed on progress



**Dr Daniel Elger** speaks to Elizabeth Njoroge-a plant doctor at the Wangige plant clinic (Credit: CABI)

made on trials testing the use of drones and the biopesticide GreenMuscle to manage desert locust swarms in Kenya.

Prof Theophilus Mutui, Managing Director of the Kenya Plant Health Inspectorate Service (KEPHIS), welcomed the CEO during a visit to the organisation headquarters. He outlined how past and present joint initiatives have directly supported safe trade, enhanced productivity through reducing the impact of pests and increased the country's cross-border relationships with other National Plant Protection Organisations. CABI's support towards surveillance of potato diseases in Kenya was acknowledged in the discussions held by the team after touring the laboratory facilities.

Dr Elger and CABI's Director General-Development, Dr Dennis Rangi afterwards met Dr Segenet Kelemu, Director General of the International Centre of Insect Physiology and Ecology (icipe) and deliberated on strategies to expand bilateral collaboration between the two organisations, and by extension joint initiatives under the Association of International Research and Development Centres for Agriculture (AIRCA) umbrella

Being Dr Elger's first overseas visit since joining CABI in September 2020, the CEO got first-hand experience on projects being implemented across Africa. During his visit to the Plantwise e-plant clinic at the Wangige market, he observed plant doctors diagnose plant health problems and using their hand-held digital devices to capture and send crop health advice via text messages to the farmers.

Closing his visit, Dr Elger expressed his appreciation for the work being done despite the challenges posed by COVID 19 and applauded the efforts of CABI staff and partners in the region.



Morris Akiri: africa@cabi.org

## Burundi steps up training efforts to meet need for more plant doctors



Plantwise master trainers Eustache Cimpaye from DPV (NPPO), MINEAGRIE and Dr Privat Ndayihanzamaso from ISABU (Dr S. Toepfer)

Burundi has been stepping up its efforts to train more Plantwise plant doctors to meet the country's need to help more smallholder farmers grow more and lose less.

The East African country officially joined the global Plantwise programme since 2021 with major partners including the Burundi Institute of Agricultural Science (ISABU), the plant protection department (DPV, NPPO) and DGMAVAE of the Ministry of Environment, Agriculture and Livestock of Burundi (MINEAGRIE). Since then, the country has trained more than 100 plant doctors, who are providing high-quality advice to farmers in around 50 plant clinics. They are particularly helping farmers by correctly diagnosing their plant health problems and recommending how to efficiently manage these more effectively.

However, in order to achieve a change in Burundi's crop production, many farmers need to be reached. This requires many more plant doctors. The MINEAGRIE aims to build the capacity of at least 300 out of the 1,000 existing commune agricultural extensions workers as plant doctors within three years.

This, in turn, requires highly skilled and professional trainers who can train people to become plant doctors. CABI has so far trained 15 national trainers. These have been conducting the training of plant doctors.



Willis Ochilo: w.ochilo@cabi.org

# Award winner highlights locust research at international conference



Violet Ochieng is the first winner of the inaugural Carol Ellison Science Award 2021 which is awarded to a student doing her/his research with CABI – with the objective of enriching their research experience with the organisation.

In this article, Violet, in her own words, speaks of her experiences at the 24th Scientific Conference of the International African Association of Insect Scientists – her first attendance at such an event – where she presented her research on piloting drones for the surveillance and control of the devastating desert locust (*Schistocerca gregaria*).

#### Promoting insect science – privileged to present

I had the privilege of presenting my research paper on piloting the use of drones for desert locust surveillance and control that I wrote under the supervision of Dr Ivan Rwomushana. I was thrilled and poised to experience my first participation in an international scientific conference and set out to share my research with the world.

Themes covered at the conference included the monitoring, surveillance and control of desert locusts and invasive species in Africa, plus the commercial and edible insects for improved livelihood and the impacts of climate change on insects in Africa.

#### **Tackling desert locust**

I was excited to share my research findings, which point to the immense potential for use of drone technology to revolutionize agriculture by providing a more robust means of desert locust monitoring, early warning, surveillance and control. This was explained by how inadequacies and challenges in current methods of locust surveillance and control could be bridged and improved by drone technology.

My presentation stirred a lot of interest from other conference participants with many asking questions in plenary and a follow-up networking session.

#### **Encouraging science journeys**

Over and above sharing my research, I was privileged to attend and listen to presentations from other research scientists in attendance at the conference. I met fellow insect scientists who shared their science journeys with me and the gaps in their various fields.

I was further motivated during the conference when I was recognized as the best anglophone junior presenter.

#### Next steps

I intend to train as a drone pilot and get certified with a flying license. This will enable me to explore other potential opportunities involving the use of drone technology beyond the scope of my current area of research.



Ivan Rwomushana: i.rwomushana@cabi.org

## Low potato yields in Kenya not down to management practices only



Low potato yields are not only determined by the management practices employed by potato farmers in Kenya, a study by CABI scientists suggests. Poor quality of potato planting materials – where there is an over-dependence on the informal sector – is also to be blamed.

Potato is one of the most widely grown crops in Kenya with the sector contributing nearly USD \$30m a year and employing over 3 million people. However, yields have been declining over the last 10 years.

This has been attributed to several problems with the most important being the high incidence of pests and

diseases, some of which are seed- and soil-borne.

CABI conducted a surveillance exercise during the second (short rains) season of 2019 to identify and map the distribution of *Pectobacterium* and *Dickeya* species which cause blackleg and soft rots in Kenya and ascertain the presence of *Clavibacter michiganensis subsp. sepedonicus* which cause ring rot in the country. The two diseases decimate yield and also affect the quality making it unfit for market.

The study involved the collection of over 1,000 samples from farms across six counties.

Dr Joseph Mulema, Senior Scientist, Research, has been managing the surveillance of potato diseases in Kenya project.

Dr Mulema said, "The low yields could partly be attributed to the poor quality of potato planting materials where there is over-dependence on the informal sector. This has resulted in planting materials infested with pests resulting in soil contaminated with soil-borne pests."

He suggests that pest free areas can be delineated – especially for the production of potato seed, in addition to supporting interventions that increase the availability of certified seed or clean seed where farmers use home-saved seed.



# Sida-funded media training for researchers ends

A Sida-funded science communication training programme to help researchers communicate their research more effectively came to an end.

The final training was delivered to researchers and PhD students at Makerere University in Uganda. This was part of a series of science communication trainings aimed at researchers at institutions in the Global South.

The training, designed to help researchers communicate their research, was delivered by SciDev. Net through its Script training programme. Course participants took what they had learnt in earlier parts of the training to pitch their scientific research to journalists. Each researcher had five minutes to pitch to a different journalist.

All five journalists who took part in the training said they found most of the research to be newsworthy. Equally important, the journalists said the researchers were able to communicate their research work in a simple language that non-specialists could understand. This showed that the course participants had grasped the core elements of science communication as a result of



**Dr Charles Wendo (right)** with training participants at the first Sida-funded science communication training at the University of Dar es Salaam in December 2019 (Credit: CABI)

#### the training.

Script Training Coordinator, Dr Charles Wendo, delivered the training in three parts that included a selfpaced online course, webinars as well as networking and pitching session with science journalists. Topics included practical ways to simplify technical information, making research findings interesting and using social media to communicate research.

Zahra Namuli, a journalist with NBS Television, added, "*I* interacted with four researchers at this networking event. All the findings they pitched were newsworthy and all their presentations were simple enough for me to easily understand."

At the close of the training, the participants had built their skills and confidence on using the media to reach policymakers and the public with their research.

Overall, more than ten institutions have benefited from the training programme geared at helping researchers communicate their research more effectively.



### Can intercropping make fall armyworm's natural enemies more effective?



**Farmers viewing** FAW parasitoid samples from their fields (Credit: Léna Durocher-Granger)

Fall armyworm (FAW) infestations can cause significant yield losses, however, management options, particularly biocontrol are available. Several local natural enemies are already present in invaded areas and have adopted FAW as a host.

In Zambia, the team has identified 15 parasitoid species. These include egg, egg-larval, larval and larval-pupal parasitoids. Studies have shown that these parasitoids attack up to 45% of the FAW eggs and larvae during the crop cycle. Considering this high diversity of local natural enemies in Zambia, further research is needed to to assess the potential effectiveness of these local natural enemies as biocontrol agents.

As part of the PlantwisePlus programme, intercropping trials have taken place over the last two years in Zambia. Parasitoid activities in maize plots intercropped with cowpeas, groundnuts, beans, sunflowers, or sorghum were assessed.

During the trial, the team sampled fall armyworm larvae and eggs each week at two sites. They identified and recorded parasitoids emerging from the fall armyworm. The ongoing data analysis will help determine the most favorable intercrop to promote local parasitoid populations.

During the latest rainy season in Zambia, more farmers established intercropping plots, which has allowed the team to take further FAW larvae and eggs samples. They will use these samples, along with the data from the first two years of intercropping, to conduct data analysis, with on-farm or on-station location added as an additional factor.



Noah Phiri: n.phiri@cabi.org

# Extension campaign helps increase maize productivity in Ghana



A Community Information Centre (CIC) prepares to broadcast messages to help farmers in Ghana improve their maize productivity and livelihoods (Credit: CABI)

A CABI-led pilot project has helped nearly 61,500 farmers in Ghana tackle fall armyworm and stalk borer by broadcasting advice from a network of Community Information Centres (CICs) with a view to increasing their yields of maize.

One hundred CICs were engaged in the Bono and Bono East Regions of the country in partnership with the Bono Regional Directorate of Agriculture to disseminate 35 key messages on various stages of the maize production cycle.

This included 12 to 16 alerts for the fall armyworm as well as the stalk borer. The advice included pest alerts on scouting for signs and symptoms of fall armyworm and stalk borer, the feeding behaviour of the two pests and the correct use of agrochemicals. Agronomy information disseminated included how to prepare the land for the minor season, use of certified seeds, weed control and post-harvest management.

During the training of the CICs' staff the Regional Agricultural Extension Officer and consultant for the pilot, Isaac Adjei-Mensah said there are numerous challenges in maize production that include aspects of soil nutrient management, weed control and harvesting.

On his part, Solomon Duah, CABI's Communications Specialist, said, "This pilot project was about using innovative ways to communicate to farmers in their locality with important messages about how to use Integrated Pest Management and increase the productivity of their crops and livelihoods."

Solomon Duah: s.duah@cabi.org

## **CABI Academy available in Rwanda**

The digital courses are designed for agricultural extension and advisory service providers. They provide practical advice and resources to participants to grow their knowledge and provide the best possible advice to farmers.

#### CABI Academy Supporting teachers and trainers

The courses are a series of interactive exercises and resources on diagnosing and managing pests and diseases. The materials work well for self-study, all the information and context required is provided. They can be accessed through this <u>link</u>.

There are currently two interactive courses available for free in Rwanda – Crop Pest Diagnosis and Crop Pest Management. They provide a methodology to diagnose and control pests and diseases.

These courses are currently in English, with French and Kinyarwanda translations available soon.

#### **Crop Pest Diagnosis**

The Crop Pest Diagnosis course features 15 hours of training across five modules, over 400 knowledge checks and 1,000 images for symptom recognition. The course supports field-based diagnosis using the Diagnostic Field Guide and covers pathogens, pests and nutrient deficiencies.

#### **Crop Pest Management**

The Crop Pest Management course helps users to apply the principles of an Integrated Pest Management approach to pest and disease management to real-world scenarios. It includes key areas such as economic considerations, bacteria, oomycetes, fungi, insects and mites as well as viruses.



Henry Mibei: h.mibei@cabi.org

### CABI centres in Africa

AFRICA HQ	WEST AFRICA	SOUTHERN AFRICA
Canary Bird 673 Limuru Road Muthaiga PO Box 633-00621 Nairobi Kenya T: +254 (0)20 2271000/ 20 E: africa@cabi.org	CSIR Campus No.6 Agostino Neto Road Airport Residential Area PO Box CT 8630, Cantonments Accra, Ghana	5834 Mwange Close Kalundu P.O. Box 37589 Lusaka Zambia
	T: +233 (0)302 797 202 E: westafrica@cabi.org	T: +260967619665 E: southernafrica@cabi.org

#### **CABI MEMBER COUNTRIES IN AFRICA**



CABI is an international intergovernmental organisation and we gratefully acknowledge the core financial support from our member countries (and lead agencies) including the United Kingdom (Foreign, Commonwealth & Development Office), China (Chinese Ministry of Agriculture and Rural Affairs), Australia (Australian Centre for International Agricultural Research), Canada (Agriculture and Agri-Food Canada), Netherlands (Directorate-General for International Cooperation), and Switzerland (Swiss Agency for Development and Cooperation). See https://www.cabi.org/about-cabi/who-we-work-with/key-donors/ for details.



www.cabi.org KNOWLEDGE FOR LIFE