

BENEFITS OF EFFECTIVE EXTENSION









Local trader selling African traditional vegetables in a market

Overcoming obstacles to traditional African vegetable production

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.

Earlier this year, I was invited to speak at the <u>Power on your Plate summit</u> that took place in Arusha, Tanzania and explored the role of traditional African vegetables in diversifying and strengthening food systems.

In this article, I share my insights from the summit touching on the challenges faced and possible solutions to boosting these untapped and underutilized vegetables in the food chain.

One of the main challenges facing the production of traditional vegetables in Africa is availability and accessibility of **good quality seed**. Over 90% of traditional African vegetables are still produced from farmer seeds from the fields. Governments should establish community resource centres and incentivise sectors such as research institutions to prioritise traditional African vegetables in national research strategies and address the production of

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improved seed varieties.

I commend the commitment from farmers, especially individual farmers and farmers' associations, who are already producing these vegetables in pilot schemes across some African countries, where trial sites are helping improve research on how traditional African vegetable production can be improved, so that our next generation of farmers can move away from farm-saved seeds to improved seed varieties.

Another drawback for traditional African vegetable production is the **size or scale** at which production is met. Key stakeholders can play a role in setting up incubation centres where their economic and nutritional value can be showcased, and insights generated used to inform policy.

Emphasis should also be placed on **policy interventions** aimed at creating more awareness about these vegetables to stimulate demand. If we do not increase demand, then micro-production, particularly by people living in urban areas will not happen. Governments have a key role to play in entrenching the economic and nutritional value of traditional African vegetables, for example through school feeding programmes. Governments can also develop policy instruments that encourage farmers to de-risk production.

Inadequate financing for traditional African vegetable production is also a challenge. Producers are often too small for the bigger financial institutions but too big for the smaller ones. So how do we make our young farmers bankable? How do we make their ventures economical? One way is to eliminate the communication gaps that exist between policymakers and researchers, women and young farmers. This will include linking them more closely to financial institutions. Therefore, moving forward, financial institutions need to make inclusive financial decisions "from the ground up" particularly those that focus on helping women farmers.

Morris Akiri Regional Director, CABI Africa

Classifying agribusiness-based advisory services: benefits and challenges of different models

Agricultural extension and advisory services – services that offer technical advice to farmers – play an important role in delivering the knowledge and tools that farmers need to increase their crop yields, improve their food security and livelihoods, and build resilience against the difficulties they face due to climate change. This is particularly true for small-scale farmers.

Governments all over the world offer extension services to help smallholders, but lack of funds mean that reach is limited. Increasingly, the private sector delivers these kinds of services complementing government efforts in many countries. An example of this is the Nestlé Rural Development Framework that guides Nestlé's work with farmers and responsible sourcing.

However, agribusiness-based advisory services take lots of different approaches and are built around lots of different models, none of which have been widely documented. CABI worked with the Royal Tropical Institute (KIT), building on their earlier work to develop a typology – or classification – of agribusiness-based advisory services. As a result, a working paper on the subject entitled *Towards a Typology for Agribusinessbased Advisory Services: Model Description and Analysis* was published.

We take a look at the six implementation models defined in the KIT/CABI working paper, including what they are, their main strengths and some of their weaknesses.

1. Advisory services by agribusiness' own staff

The first model is one in which the agribusiness sets up its own advisory service. In this model, extension work is done mostly by staff that are regular employees of the agribusiness. The main strength of this model is the close integration of the extension work within the company's main business; it allows for relatively easy planning and management of the extension work. However, a major concern that makes companies look for alternative models is the challenge of reaching larger numbers of farmers and the related costs.

2. Working through lead farmers (farmer extensionists)

This agribusiness model relies on a relatively small team of – often more senior – agronomists and a network of carefully selected farmers or local resource people to act as the main regular source of knowledge for farmers in their area. For many agribusinesses, the possibility to reach out to a larger group of farmers at manageable costs is the main driver for using this model. However, the lower quality of the services provided by the farmer extensionists, both in terms of technical content and the training and advisory process, can be seen as a downside of this model.

3. Working through agrovets

For agribusinesses selling farm inputs, the suppliers, also known as agrovets, are crucial actors. Farmers often cite them as a source of advice, although this varies from country to country. A major advantage of this model for agribusinesses, compared to relying on their own advisory services, is the lower level of costs per farmer reached. Its main disadvantage is the challenge of achieving adequate quality of technical advice given by the agrovet staff.



4. One-stop-shop networks

One-stop-shops are places where farmers can obtain inputs from a larger range of suppliers as well as receive technical training and advice, access services such as credit and mechanization support, and benefit from help with marketing. A major strength of this model lies in the attractiveness for farmers to access company products as well as services, including extension, by having all their needs met at one location. The main challenge of this model is the complexity of offering a well-functioning and diverse range of services.

5. Commercial farm-based advisory services

In this more recently created model, advisory services and farmer training are organized by the agribusiness around and through a well-functioning and advanced commercial farm. The strength of this model lies in its potential for longer-term sustainability since costs of advisory services are covered from the revenues of a well-functioning farm or from direct payments by farmers benefitting from the services. However, its use is probably limited to those agribusinesses involved in and promoting more technically complex and advanced production systems.

6. Sub-contracting advisory services

In quite a few cases, agribusinesses do not set up their own agricultural advisory service but subcontract other specialized organizations to do this for them. The main advantage of this model is that it allows the agribusiness to concentrate on the activities in which it specializes. The disadvantages of this model lie in the less direct and thus more limited influence that the agribusiness has on implementation of advisory services, including the farmers it reaches, and the quality of the extension.

Looking to the future

We might ask ourselves, why is this type of classification helpful? As agribusinesses develop more and more services, a well-developed description of the different models allows agribusiness and support organizations, including donors, to make choices about the set-up of and investment in advisory services.

A common debate argues that as public sector government support declines in the developing world, sustainable private sector models will become increasingly important. However, there are many questions that still need to be explored around agribusiness-based advisory services: What are the required levels of education for different roles? Do they represent employment opportunities for women and youths and, if so, in which context? The working paper is a valuable study on this important area of agricultural extension, and we hope it helps to stimulate further research on this topic.

To read the working paper in full, see <u>Towards a Typology</u> for Agribusiness-based Advisory Services: <u>Model</u> <u>Description and Analysis</u>.



Dannie Romney: d.romney@cabi.org

Data Sharing Toolkit to unlock greater food security



CABI has joined forces with the Open Data Institute (ODI) to launch a Data Sharing Toolkit, which could contribute to unlocking greater food security in Sub-Saharan Africa and South Asia through better access to information on soil health, agronomy and fertilizers.

The new resource, made possible, thanks to funding from the Bill & Melinda Gates Foundation (BMGF), aims to equip development practitioners (Foundation programme officers, their grantees, partners and other donors) with the necessary skills to develop better grants that will foster more access to agricultural data.

Based upon FAIR principles – that is, the data should be Findable, Accessible, Interoperable and Reusable, the Data Sharing Toolkit helps to increase the understanding of good data-sharing practices and the potential benefits, such as greater food security.

The Data Sharing Toolkit – which is accessed via the CABI Academy platform – includes seven e-learning modules with supporting case studies, checklists, *cheat sheets* and guides to help demystify how to use, collect, share FAIR and safeguarded data for the benefit of a country's agricultural economy.

The modules include 'Considering data in investments' as well as 'Reusing data from third-party sources' and 'Assessing in-country potential for data sharing.' Meanwhile, case studies provided include 'Improving food security through harmonised soil data in South Asia' and 'Making soil data findable, accessible, interoperable, reusable and open.' Practical guides – such as 'Developing a data management plan' and 'Deciding how to provide access to data' are also included on in the Data Sharing Toolkit along with country profiles that outline agricultural data policy and legislation for Ethiopia, India, Kenya and Tanzania.

The Data Sharing Toolkit was developed in joint collaboration with senior officials and academics in Ethiopia and India. This work has contributed to the implementation of a soil and agronomic data policy in Ethiopia, while training and support around data sharing in India has already caused a shift in attitudes towards FAIR data.

Ruthie Musker, CABI's Project Officer, Data Policy & Practice, said, "By enabling greater access to data on soil health, agronomy and fertilizer, smallholder farmers can be better equipped to innovate and improve their farming practices and, ultimately, increase their yields, livelihoods and local, regional and national food security.

Deborah Yates, Principal Consultant at the Open Data Institute, said, "This set of tools has been developed for agricultural projects and has been tailored with those in mind. But the concepts and the ideas in there could very easily be tailored for other domains in other walks of life."



Victor Clottey: v.clottey@cabi.org

Effective extension promotes better practices



Christine Alokit Communication and Extension Scientist

In recognizing the role of Women and Girls in Science, we turn the focus on CABI's own female scientists to highlight the invaluable work they contribute towards our mission of helping smallholder farmers grow more and lose less to crop pests and diseases. Here we find out more about **Christine Alokit** who takes lead on the production and implementation of communication materials for various stakeholders and extension – coordinating CABI's activities to help smallholder farmers in Uganda increase their yields and livelihoods.

Christine has worked on a range of projects aimed at using multiple communication methods to increase agricultural productivity including 'promoting good seed in East Africa,' 'Africa soil health' as part of the Africa Soil Health Consortium, 'Optimizing Fertilizer Recommendations in Africa' under OFRA, 'managing maize lethal necrosis disease in eastern and central Africa.'

What motivated you to work in science and development?

During my undergraduate degree in BSc in Agriculture from Makerere University, I majored in Agricultural Extension. One of the course units I learnt was Agricultural journalism that encompassed writing articles for farmers, extension, photography among other aspects. At that time, I did not immediately realise how much I would apply that knowledge. When I got a job later as an extension worker, I realised the continuous need for information among farmers and other agricultural actors. with questions on where to get information for various agricultural problems by farmers, processers, traders, friends and relatives. This made me realise how much information actually exists that does not get to intended beneficiaries. Sometimes if disseminated, it is not well packaged and the target audience misses out.

Which female scientist inspires you and why?

I will mention two current scientists Engineer Winnie Byanyima, Executive Director UNAIDS and Professor Ruth Oniang'o, a nutritionist, former politician and a member of CABI governing board. These have gone beyond the technical science and demonstrated that it is possible to make practical change in peoples' lives at the various positions they held – management and politics. The fact that as a scientist, one can also rise to high level decision-making levels is admirable. I have stepped out of the mainstream science to manage CABI programs and do communication work to reach out to various stakeholders in agricultural sector. I take pride in that!

What has been your biggest achievement?

Having a feeling of self-worth through my communication career has been very rewarding. I have worked with scientists and made them appreciate value of communicating their work. Through practical hands on training, scientists and extension workers realised they can package information into simple messages that can easily be understood and applied by farmers. Through various engagements, the scientists and extension workers developed various materials such as story charts, radio campaign messages, drama and animation scripts, plus educative videos for use by low literacy farmers.

What barriers have you faced as a woman in your work and how have you overcome them?

I have sometimes experienced some level of resistance by some scientists to appreciate the role of communicating their research outcomes beyond scientific journal publications.

I have overcome some of these barriers through partnering with scientists who share the common goal of communicating research outcomes. Most of the materials we have developed are also available on the CABI website and are easily accessible to extension workers.

As I advanced in my career, I have always been faced

What does the future hold for you and other women working in science and development?

Women need to critically focus and apply rigour in their interest areas and should embrace communicating their science and development work vigorously. Social media can support them reach out to a big audience and women should embrace use of the internet as well.

What advice would you give to girls and women thinking of pursuing a career in agricultural extension and communication?

I encourage women in science to step out and actually reach out to intended people with information. You

might have fantastic outcomes from your research but that will add lot of value if it is packaged for lower level audiences that have to use it. What research are you doing? What is relevant to be communicated to the public at every point in time? Take keen interest in communication and don't leave it to journalists only. Actually, having a good understanding of communication helps one work with journalists better. There are now plenty of short free online communication courses that girls and women can use for professional development.

Christine Alokit: c.alokit@cabi.org

Fall armyworm devastation likely to cause hunger



CABI has led the first study to explore the income and food security effects of the fall armyworm invasion on a country – revealing that in Zimbabwe smallholder maize-growing households blighted by the pest are 12% more likely to experience hunger.

Dr Justice Tambo, lead researcher of the study published in Food and Energy Security, sought to investigate the impact of the fall armyworm (*Spodoptera frugiperda*) on household income and food security as well as the extent to which a control strategy can help mitigate the negative impacts of the pest.

He, along with CABI colleagues from its centres in Kenya and Zambia, as well as in collaboration with Zimbabwe's Ministry of Lands, Agriculture, Water and Rural Settlement, also found that severe levels of infestation reduced per capita household income by 44% and increased a household's likelihood of experiencing hunger by 17%.

Indeed, the research – which looked at survey data obtained from 350 smallholder maize-growing households in six provinces across Zimbabwe – showed that households affected by fall armyworm were 11% more likely to experience food shortage, and their members had a 13% higher probability of going to bed hungry or going a whole day without eating because of household food insufficiency.

The scientists also discovered that the fall armywormaffected households who failed to implement a control strategy, had a 50% lower per capita household income, while their counterparts who implemented a control strategy did not suffer a significant loss of income. Approximately, 30% of 185 households who reported fall armyworm infestation in their farms did not implement any intervention.

Those who did manage to control the pest typically used synthetic pesticides and handpicking of egg masses and larvae. Other methods included pouring ash or sand into maize whorls, rogueing and burning of infested plants, and the application of detergents.

Rwomushana et al. (2018) argues that the pest has the potential to cause an annual reduction in maize production in Zimbabwe of about 264,000 tonnes, translating into revenue loss of US\$ 83 million.

Dr Tambo, who is based at CABI's Swiss Centre in Delémont, said, "Our results suggest that while fall armyworm cannot be eradicated, taking actions to at least prevent severe level of infestation can significantly reduce welfare losses in terms of income and food security."

This paper can be viewed open access here: <u>https://</u>onlinelibrary.wiley.com/doi/full/10.1002/fes3.281



Noah Phiri: n.phiri@cabi.org

Bold growth for the African biocontrol sector



Pilot roll-out of biopesticide, Fawligen, to fight fall armyworm in South Sudan

CABI scientist Dr Lakpo Koku Agboyi outlined a range of opportunities for growth in the African biocontrol sector to fight crop pests and diseases as part of the Global Biocontrol Conference 2021 attended online by biocontrol experts from around the world.

Dr Agboyi, who is based at CABI's centre in Ghana, delivered a presentation which updated stakeholders on what is already being done in Africa to increase the use of more safer-to-use and environmentally-friendly biocontrol products to tackle challenges which affect the livelihoods of millions of smallholder farmers.

He also spoke about the strength and weaknesses of the trade and adoption of biocontrol products in Africa, as well as factors which could help drive growth in their use amongst smallholder farmers across the continent.

Current pests being managed include the fall armyworm (*Spodoptera frugiperda*) – where an AgBiTech/CABI partnership under the Action on Invasives programme in Kenya and South Sudan has seen the baculovirus product 'Fawligen' prove effective against the pest.

Dr Agboyi also highlighted how Acerophagus papayae, which originated from Central America, was released in 2011 and has had a successful impact against the Papaya mealybug (*Paracoccus marginatus*) pest in West Africa.

He also drew attention to the Green Muscle[™] product, created by CABI and produced and marketed by international biological control producers Éléphant Vert, which is being used to control locusts and grasshoppers in Benin, Burkina Faso, Mali, Mauritania, Niger and Senegal. Dr Agboyi said, "Global attention has been brought to the use of more eco-friendly and cost-effective biocontrol options but their development relies upon continuous research and innovation as well as willingness for their adoption – particularly by smallholder farmers."

In his presentation, Dr Agboyi highlighted the various types of biocontrol approaches – including conservation, augmentative, classical and microorganisms-based biopesticides – as well as who does research on biocontrol in Africa.

He outlined biocontrol success stories – for example, out of 103 biocontrol agent species introduced to control 51 weed species in South Africa, 70% have established and 75% of targeted weeds controlled.



The release of *Neochetina eichhorniae* and *Neochetina bruchi*, for instance, led to the successful control of Water hyacinth in Lake Victoria in Uganda.

Samanta Fawcett, Head of Conference Production at the Global Biocontrol Conference 2021, said that while the biocontrol market has been growing significantly over the past few years, there is still uncertainty from within the industry on how to get these products effectively to market. Regulations, testing, registration and scaling up production continue to prove to be major challenges.

In her welcome message she said, "The best way to apply biological control agents is part of integrated pest management practices. While these will effectively present pests developing resistance and will also minimize the use of pesticides, they have been facing resistance from farmers as they are deemed to be less efficient than traditional chemical pesticides."



Lakpo Agboyi: l.agboyi@cabi.org

Integrating crop-livestock advisory services in Uganda



The plant clinic system brings together 15 years of experience in the delivery of plant health advice (Credit: Benius Tukahirwa, MAAIF)

CABI is working in partnership to deliver a 'One Health' approach to advisory services which will help 1,200 smallholder farmers in Uganda deal with major health and production problems affecting their crops, livestock and food safety.

The project will develop integrated crop-livestock health advisory services for both male and female smallholder farmers – building upon CABI's 15-years' experience of providing plant health information through Plantwise plant clinics.

The joint clinics and consultations will broaden the scope of existing plant clinics to help better meet the farmers' needs for agricultural advice and will contribute to the overall goal of improving the health and livelihoods of smallholder farming families in East Africa.

The project builds upon a previous study to assess demand for livestock services during plant clinic sessions in selected countries including Kenya and Uganda. The current work is being funded by the Biovision Foundation and carried out in collaboration with Vétérinaires Sans Frontières (VSF) International in Kenya, Makerere University, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) as well as the District Local Governments of Mukono, Luwero, Buikwe and Kayunga in Uganda.

The 'One Health' is envisaged to be cost efficient in joint service delivery and will lead to enhanced knowledge and awareness of farmers on the interdependence of crops and livestock for productivity, health and food safety. It is anticipated that the project will strengthen the crop-livestock health advisory system among plant and livestock outreach services and explore the possibilities of expanding the model to farmers in Kenya, following on from lessons learnt as part of the pilot study in Uganda.

The project's key activities involve collecting farmer baseline information and practices on the One Health principle, establishing and operationalizing 80 joint crop-livestock clinics and consultation sessions in the four districts of Uganda, training crop and animal health officers in identified One Health topics, and providing relevant information materials for farmers and veterinary staff on One Health topics.

Other activities will include assessing farmers' demand for livestock advice at plant clinics in Kenya and sharing experiences from the Uganda pilot with relevant crop-livestock stakeholders in Kenya to pilot similar interventions.

Already, One Health crop-livestock clinics and consultations have been launched at the project sites and districts in Uganda, with a range of operational strategies and priorities agreed upon. These include no livestock to be brought to the joint consultation sessions to avoid the risk of fast disease spread, crowdsourcing of information materials for farmers and extension, a plan of training of joint clinic staff in selected One Health topics and data management as well as learning from the current One Health initiative operated at the Ugandan Ministry of Health and other initiatives.



Christine Alokit: c.alokit@cabi.org

Value chain financing for youth in agribusiness



Organising young people into business entities and employing innovative value chain financing approaches to encourage more youth participation in agribusiness have been suggested in a new CABI-led study focussing on Zambia and Vietnam.

The research, published in the journal Development in Practice, sought to understand the nature of youth participation and identify barriers and opportunities for youth engagement in agriculture and agribusiness in Lusaka, Zambia and Vinh Phuc, Hung Yen, Dak Lak and Tien Giang in Vietnam.

The scientists, led by Dr Joseph Mulema who is based at CABI Africa in Kenya, found that while a majority of youth were engaged in agriculture – primarily production – few were involved in input supply, trading, transportation and the provision of advisory services.

By conducting key informant interviews and focus group discussions in the two countries, supported by desk studies, the researchers also found that barriers to participation in agribusiness included a lack of startup capital, low profitability of enterprises and personal aspirations.

Dr Mulema and CABI colleagues, including those from centres in Zambia and Malaysia, and Dr Pham Thi Xuan of the Vietnam Academy of Agricultural Sciences (VAAS), suggest that organising youth into business entities and employing innovative value chain financing approaches may help increase the participation of young people in agribusiness. emphasized disinterest of youth in agriculture, this study showed that a majority of youth interviewed were engaged in agricultural activities at various levels.

"Farm production was the most dominant and youth grew both food and cash crops. There were differing levels of participation between male and female youth – an indication of inherent differences in resource capacity, culture, aspirations and knowledge – which were also important factors affecting youth participation in agriculture generally.

"Market and marketing challenges associated with agricultural enterprises were mentioned, though these are not necessarily unique to youth but smallholder agricultural production as a whole."

The study found that in Zambia, almost all the youth (99%) were engaged in farm production, producing crops and animals for home consumption and local markets.

However, in Vietnam, the youth had more diversified activities in agriculture including farming (88%), input supply and the sale of fertilizers, pesticides, seeds, manure and cattle feed/fodder. Of those who engaged in farm production, 95% produced for both own consumption and market. Just 5% took part in contract farming, tractor hiring/driving services and draught power operations.

Co-author Dr George Oduor, also based at CABI Africa in Kenya, said, "Given the importance of agriculture in creating jobs for the youth, and the fact that the youth are already engaged though with limited benefits, this study recommends an integrated approach that enhances access to finance, business skills, and organisational capacity of the youth.

"This would allow them access to lucrative and niche markets and be business leaders in the sector. Interventions that integrate modern technology and ICTs are particularly helpful in helping start-ups to navigate market challenges."



Joseph Mulema: j.mulema@cabi.org

Dr Mulema said, "Although several studies have

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

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