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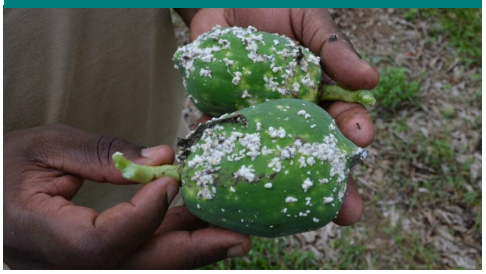
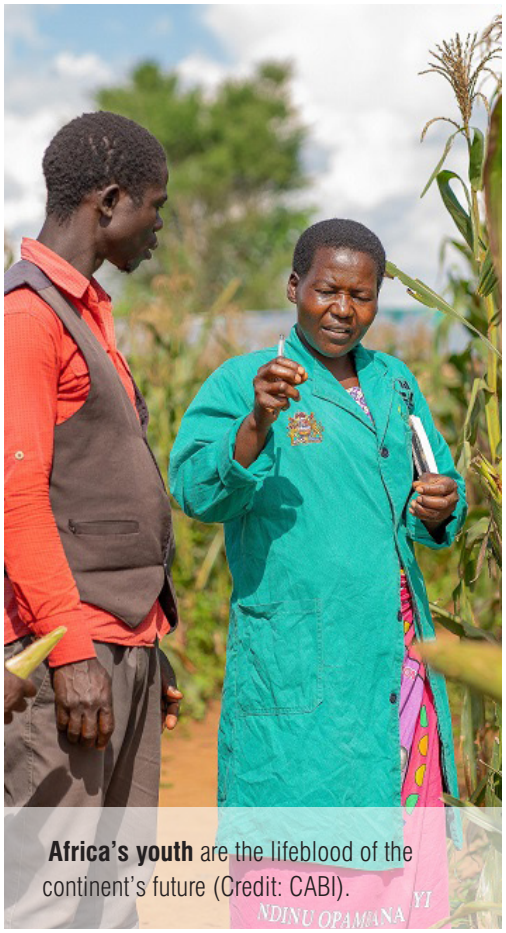
CABI

CABI in Africa





Africa's youth are the lifeblood of the continent's future (Credit: CABI).

Revolution for Africa's youth unemployment

It's a startling statistic, but by 2050 Africa's population is expected to double to around 2.6 billion. This creates greater pressure to feed many amid the challenges of economic, political and societal instability and climate change.

Dr Dennis Rangi, Director General, Development writes that Africa's youth unemployment challenge needs a revolution in order to sustain global development.

Revolution in agribusiness

A 'revolution' in agribusiness involving Africa's youth is required so they can capitalise on the sector's contribution. This is especially true when thinking of young people's roles in agricultural value chains. We need to take a 'two-pronged' approach to enhancing their skills not only in producing safer foods free from crop pests and diseases, but also in helping to involve them as village-based advisors – giving crucial information to help increase yields.

Digital innovations

One of the findings in a book recently published by CABI titled 'Youth and the Rural Economy in Africa,' recommends a targeted technology promotion aimed at young people, most of whom are 'digital natives'.

One example where CABI has extensively supported smallholder farmers including the youth in Africa and beyond is the Good Seed Initiative.

The project enabled women and youth in Uganda and Tanzania to engage in market-driven profitable value chains that required minimum capital, capital and other factors of production.

This was achieved by empowering women and the youth with requisite skills for seed entrepreneurship of indigenous vegetables which continued to be in high demand.

Barriers and opportunities

In research conducted by CABI – which focussed on Zambia and Vietnam – we 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.

We 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.

This is where initiatives such as the CABI-led PlantwisePlus global programme can engage youth in non-formal extension services and help fill in the missing linkages within the agricultural value chain.

In Uganda, where 70% of those unemployed are youths, CABI partnered with Zirobwe Agaliawamu Agri-business Training Association (ZAABTA) in Luwero district. This was to skill youth to enable them to provide various services in major agricultural and profitable value chains in the country.

Knowledge exchange

We believe helping to enable youth to provide services as 'village-based advisers' in this way will be an attractive option to our youth and call for it wholeheartedly – even if they wish to engage in this activity alongside regular farming activities.

In Uganda, for example, CABI's practical hands-on course on field diagnostics and plant clinic operation is giving good recommendations to farmer students at various years of study.

The course was first introduced at Makerere University in 2013 and is now offered by Uganda Christian University, Bukalasa Agricultural College, Busitema University and Gulu University.

We need to build our capacities and strengths in partnership to help address the 'youth bulge', and also the growing demand on youth and their role in agriculture to feed the rising population.

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Helping Kenya meet KS1758 food safety standard

The training sought to help Kenya meet the KS1758 standard on food safety for fruits, vegetables and flowers (Credit: CABI)

CABI – through the PlantwisePlus programme and in partnership with the Fresh Produce Consortium of Kenya (FPC Kenya) – has delivered training to help Kenya meet the KS1758 food safety standard for its fruits, vegetables and flowers.

The Kenya Standard 1758: 2016 (KS 1758) is a code of practice for Kenya's horticulture industry, outlining the sanitary and safety criteria for the production, handling, and sale of flowers, ornamentals, fruits, vegetables, herbs, and spices.

The second cohort at the KS1758 standard training (Credit: CABI)

The six-day training was provided for 120 trainers, who represent different fruit, vegetable and flower exporters in Kenya, on issues such as post-harvest handling, labour safety, pesticide use, plant nutrition, traceability and record keeping.

It is then expected that those trained will cascade this knowledge down to other actors within their respective organizations. This is to meet the KS1758 standard that the Kenyan Government is making mandatory to meet from 1 November 2022.

Lucy Karanja, CABI's Content Manager was interviewed by Kenya's national TV channel KTN about the training to meet the KS1758 standard.

Ms Karanja said, "*The challenge that we have been having which is being addressed by this KS1758 standard is the climate change. For example, the impact of rains has changed so the yield we used to get 10 years ago – we can no longer achieve that.*

"The KS1758 standard is also addressing sustainable production, meaning, if you are getting something out of the soil you need to put something back into the soil. And that is in terms of using good agricultural practices."

Importance of fertilizer

A session on fertilizer highlighted how operators should conduct a risk assessment of fertigation water and maintain records of water and fertilizer used.

Another session on the control of pests and diseases and the procurement of pesticides, focused on the transportation of pesticides and hazardous chemicals, storage of pesticides, application of pesticides and protection of workers and disposal of surplus, unwanted, and empty pesticide containers.

Food safety and quality

Mr Okisegere Ojepat, the CEO of FPC Kenya took the participants through food safety, quality, and hygiene. The objective of this session was to enable the participants to understand the concept of food safety and quality and the requirements of good hygiene practices.

He talked of food-borne illness being a genuine concern globally. Other challenges with climate change, changing agricultural practices and human behaviour being continue to be key factors affecting food safety systems.

He then discussed the concepts of food safety hazards, pre-requisite programs (PRPs), hygiene, the quality concept, traceability, and food infection. All these components are covered in the KS 1758 Standard, hence the push for the full implantation of the Standard.

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5 ways youth agricultural training benefits young people in Uganda

The training group discuss diagnosing plant health problems in beans (Credit: NewVision)

The CABI-ZAABTA youth agricultural training programme is changing the story for young people in Uganda. We look at the initiative and why it is showing signs of success.

Under the PlantwisePlus programme, CABI is helping to deliver agricultural skills to youths in Uganda and has partnered with Uganda's Zirobwe Agaliawamu Agri-business Training Association (ZAABTA). CABI and ZAABTA launched a youth training programme that brought together youths and focused on plant health problems, diagnostics and management.

1. Youth agricultural training focuses on essential pillars

The youth agricultural training focuses on various important pillars: Agricultural production, storage, processing, marketing, business skills, and soft skills such as mindset change training

2. Youth agricultural training focuses on empowerment

The training programme focuses on empowering young people through emphasis on business skills such as entrepreneurship and financial and managerial literacy. Soft skills focus on aspects such as self-realisation, communication, interpersonal, self-control and positive self-concept skills. Furthermore, strategic partnerships support access to financial credit and markets. These factors give young people the boost and confidence they need to succeed.

3. Youth agricultural training builds motivation

The youth agricultural training has increased the interest of the trainees in agriculture as a career path.

"*When I return home, I am going to demonstrate to the farmers my newly acquired knowledge to build confidence. And later, I will start charging a small fee,*" says trainee Harriet Namuli.

4. Youth agricultural training prioritizes women

One of CABI's four areas of focus is women and youth. CABI assessed existing rural and peri-urban employment initiatives to explore job opportunities in agricultural services.

However, while looking into farmers' needs, CABI reviewed specific obstacles women farmers face. Challenges often prevent women from participating effectively in profitable value chains. The training seeks to address this.

5. Youth agricultural training brings the multiplier effect

Through Plantwise, CABI and the Ugandan government have worked together to empower extension officers. Involving youths in extension can have a multiplier effect.

Mr Byantwale, Commissioner for the Department of Crop Protection, Ministry of Agriculture, Animal Industry and Fisheries, explains how CABI experts helped the ministry simplify messages delivered to farmers through extension. He is confident that including young people in extension can boost this further. He says that the multiplier effect of this will be "tremendous".

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PlantwisePlus launches in Ghana

The Duayaden plant clinic helping farmers grow more and lose less to crop pests and diseases (Credit: CABI)

A new CABI-led worldwide programme – PlantwisePlus – launches in Ghana to help smallholder farmers produce more high-quality food.

Special emphasis will be placed on improving extension services for the country's female farmers who 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 agricultural production and improve the welfare of rural households.

PlantwisePlus will support Ghana's Ministry of Food and Agriculture (MoFA) predict, prepare and prevent a range of plant health issues which put food security and livelihoods at risk.

The new programme will also work in partnership with the Plant Protection & Regulatory Services Directorate (PPRSD), Environmental Protection Agency (EPA Ghana), Ghana Green Label Scheme and the Council for Scientific and Industrial Research.

Dr Ulrich Kuhlmann, Executive Director, Global Operations and PlantwisePlus Programme Executive, said, "*The programme in Ghana will deliver processes and tools that will strengthen detection and response to pest outbreaks such as the devastating fall armyworm.*

"It will also provide digital advisory tools to boost sustainable agriculture and improve the capacity of public and private actors offering support to smallholder farmers to diagnose crop health problems – and recommend sustainable management practices."

Dr Morris Akiri, Senior Regional Director, Africa, added that the use of low-risk plant protection solutions to reduce the reliance on high-risk farm inputs that have adverse effects on human health and biodiversity will be a key feature of the PlantwisePlus programme in Ghana.

Ghana is one of six PlantwisePlus countries that will effectively serve to 'prove-the-concept' for the programme in its delivery of digital innovations. These will bring efficiency in plant health management and have strong potential for broad application. The other countries are Kenya, Pakistan, Zambia, Bangladesh and Uganda.

PlantwisePlus has already been working with the Women in Agriculture Development Directorate (WIAD) and the Deputy Director of the Agricultural Extension Services Directorate within MoFA to see how extension services for women can be approved.

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Multi-channel approach to extension benefits farmers

A multi-channel approach to extension reaps greater benefits for smallholder farmers fighting the fall armyworm pest in Eastern Rwanda according to new CABI-led research published in the journal Food and Energy Security.

The study, which was led by Dr Justice Tambo and included colleagues from Kenya, as well as the Rwanda Agriculture and Animal Resources Development Board (RAB), surveyed 720 smallholder and found maize yield increases between 10% to 34% depending on the channel.

Dr Tambo and the team found that exposure to a combined mass extension campaign consisting of plant health rallies, radio dramas and SMS all contributed to better identification of fall armyworm (*Spodoptera frugiperda*) as well as more environmentally-friendly ways of managing the pest.

The findings suggest that while there is a growing popularity in the use of digital extension approaches to deliver timely information to farmers in a cost-effective manner, much greater gains can be achieved if they are combined with other low-cost face-to-face

A multi-channel approach to extension services to help smallholder farmers (Credit: Bartay 2017)

extension methods, such as plant health rallies.

Dr Tambo said, "*Our findings suggest that exposure to the campaign channels is associated with increased knowledge outcomes, including knowledge of the correct identification of FAW, the use of cultural practices as the first resort to FAW management, timely planting to limit infestation and timely spraying for effective control of the pest.*

"However, the positive effects of the campaign are statistically significant only when the field-based extension method is combined with digital extension approaches. Moreover, we found that the effects are greater for households that were exposed to all the three channels, suggesting complementary effects of the channels."

Dr Tambo added that the results showed, for instance, that receiving FAW messages through any of the channels is correlated with a 7 percentage point increase in farmers' level of knowledge on fall armyworm. But the knowledge gain could increase to up to 23 percentage points when the information is received through all the three channels under study.

The scientists, in conclusion, say that future research could concentrate more on the intensity of exposure to the information channels.

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Could biocontrol solve the papaya mealybug problem in Uganda?

Papaya mealybug on a papaya fruit

Papaya mealybug, *Paraccous margniatus*, is native to Central America but has spread rapidly in invaded countries. It was detected in Uganda in 2021 where it has the potential to affect the production and quality of papaya and other host crops.

Papaya mealybug spread

The trade in live plant material, such as papaya fruits and seedlings, has accidentally accelerated the spread of papaya mealybug outside its native range.

Without natural enemies to manage outbreaks, farmers often turn to pesticides. The lack of registered pesticides results in farmers using highly hazardous chemicals that are not only ineffective but can negatively impact native insect biodiversity such as pollinators and natural enemies of pests.

Rapid Rural Appraisal of papaya mealybug

As part of the PlantwisePlus programme, CABI in collaboration with the National Agricultural Research Organisation (NARO), conducted a Rapid Rural Appraisal (RRA) of papaya mealybug in Uganda. The appraisal sought to gain an understanding of the presence, distribution, and impact of papaya mealybug in Uganda as well as farmers' management practices. The evaluation also assessed farmers' willingness to adopt and use biocontrol and their information requirements around biocontrol products.

Information from the appraisal will be used to design an integrated management strategy for papaya mealybug as well as help target community-level communications.

Sustainable options

Biological control represents a sustainable and effective management option, however, the farmers interviewed had mixed views on the method and the efficacy of the parasitoid in Uganda's agroecologies. This highlights the importance of proper testing and community-level communication before the introduction of exotic natural enemies and the promotion of unfamiliar pest management options. Extension in particular plays a vital role in the research and advancement of low-risk options.

Implementing a biocontrol programme

The PlantwisePlus programme is now looking at the activities required for the implementation of the biocontrol programme in Uganda. In particular, they are developing extension and farmer training manuals to cover papaya crop integrated pest management. These will include papaya mealybug as well as other pests affecting papaya production in the country.

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Steps to strengthen Burundi's plant health system

A Plantwise plant doctor advises a farmer in Burundi on how to protect her crop from pests and diseases (Credit: CABI)

A CABI-led study has proposed seven key steps which should be taken to strengthen Burundi's plant health system (PHS) and in doing so help improve the country's food security and ability to tap into valuable export markets.

The research, published in the journal *Sustainability*, found that Burundi's PHS at the time an assessment was carried out, demonstrated inadequate skills to serve farmers and insufficient capacity to diagnose crop pests which can affect yields and livelihoods.

The study was also conducted together with colleagues from the Institut des Sciences Agronomiques du Burundi (ISABU).

Interventions proposed

Seven broad interventions have been proposed to help quickly strengthen the PHS of Burundi and include linking plant health policies, processes, planning and budgeting to the UN Sustainable Development Goals.

Other recommendations include the provision of sufficient plant health equipment and infrastructure and the supply of good-quality, affordable pest control products, diagnostic tools and other agricultural inputs.

Agriculture in Burundi employs 84% of the working population, provides 95% of the food supply and contributes nearly 40% towards the country's gross domestic product. It also accounts for more than 90% of foreign exchange earnings and is the leading supplier of raw materials for the agro-industry.

However, agricultural productivity in Burundi is hampered by several issues including crop pests and diseases, occasional droughts and floods, limited cash for inputs such as fertilizers and plant protection products, and inefficient use of water resources.

It is also impeded by land fragmentation, lack of cash and credit facilities among smallholder farmers and limited access to research and extension services.

Plantwise support

To respond to the challenges impeding agricultural productivity in Burundi, CABI through the Plantwise programme has trained more than 100 plant doctors who are providing high-quality advice to farmers in around 50 plant clinics.

Burundi's Ministry of the Environment, Agriculture and Livestock (MINEAGRIE) aims to build the capacity of at least 300 out of the 1,000 existing commune agricultural extensions workers as plant doctors within the next three years.

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Sharing SPS expertise with Royal Society of Biology

Dr MaryLucy Oronje - SPS Scientist

CABI's Dr MaryLucy Oronje has shared her expertise in sanitary and phytosanitary (SPS) measures on crop pest management in Africa as part of an event organised by the Royal Society of Biology.

Dr Oronje, was a keynote speaker at the event which was attended by more than 60 plant health professionals and funded by the UK Department for Environment, Food and Rural Affairs (Defra).

The event was chaired by Dr Geraint Parry, executive officer of the Association of Applied Biologists, who introduced Dr Oronje before she drew upon her 10 years of experience specialising in crop protection and integrated pest management to examine the challenges and solutions for pest control.

She discussed several selected pests of concern to Africa, from the Papaya mealybug to water hyacinths, and outlined the challenges of the prevention of pests crossing borders.

Dr Oronje noted that weak border biosecurity and an inadequate infrastructure to limit invasions are some of the main issues society needs to tackle.

She went on to propose opportunities to minimise the spread of pests in Africa, including the necessities of pest risk analysis, pest modelling, and surveillance.

Dr Oronje touched upon some of the projects CABI is involved in to help limit the spread of these pests, including strengthening the horticulture sector in Ghana to enhance exports to the EU and using drones as a means of surveillance in tracking desert locust populations.

The event ended with an audience Q&A and discussion, chaired by Dr Parry, which brought about insightful comments from Dr Oronje on the issues she raised in her talk.

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Joining forces to curb spread of Cassava Brown Streak Disease

CABI has joined forces with the Zambian Government in a bid to help curb the spread of devastating Cassava Brown Streak Disease (CBSD), which can lead to total loss of the crop.

CABI staff from Lusaka and Nairobi, Kenya, met with officials from Zambia's Ministry of Agriculture (MoA) and His Royal Highness Senior Chief Kaputa agree to work collaboratively on a plan to help fight CBSD in Zambia.

Also working, as part of a campaign to raise awareness and act against CBSD, are the Zambia Agriculture Research Institute (ZARI), Department of Agriculture (DoA) and Dziwa Science and Technology Trust (DSaT).

CABI's Dr Noah Phiri, Dr Chapwa Kasoma and Dr Ivan Rwomushana, attended the stakeholder meeting following a CABI-published evidence note highlighting the impact of CBSD on cassava – Zambia's second most important crop after maize.

The evidence note states that CBSD threatens the development of Zambia's cassava sub-sector. This includes increased demand for the tubers from Zambia Breweries, Zhongkai international, Itabwa Investments and Sun Bird International which need over 50,000 tonnes of annual cassava feedstock for brewing, mining, confectionary and biofuel production.

The stakeholder meeting followed a training workshop aimed at Zambia's media which can play a vital role in the dissemination of information to help raise awareness amongst smallholder farmers of the issue

A media orientation event preceded the stakeholder conference on Cassava Brown Streak Disease to help journalists better report the issue affecting farmers in Zambia (Credit: Elias Chulu – MUVI TV)

that currently has no cure.

During the stakeholders meeting, the Minister of Agriculture Mr Reuben Mtolo Phiri expressed the Government's commitment to curbing the spread of CBSD in the country together with other strategic partners at the meeting, as well as learning lessons from other countries that have successfully handled the disease.

The meeting also agreed on a response plan to curb the spread of the disease, including better diagnostics, phytosanitation at the farm and community level and the development of a seed system to ensure farmers can get access to improved and disease-free planting materials. CABIs PlantwisePlus will seek to support Zambian farmers towards the attainment of the Country's vision to manage the CBSD menace.

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How are plant health rallies supporting plant health in Burundi?

Plant Health Rallies in Burundi help farmers address plant health problems (Credit: CABI)

Plant health in Burundi is getting a boost from plant health rallies. These events are a novel way of reaching farmers with plant health knowledge to help them take care of their crops. They are usually meetings held in rural places among farming communities. Plant doctors (plant health experts) hold the rallies in locations that

farmers can easily reach, like markets. The CABI-led Plantwise programme uses rallies as an extension tool to support small-scale farmers. The rallies help plant doctors quickly reach many farmers with targeted plant health information.

At the rallies, plant doctors often talk about crop diseases and pests. But they can also cover subjects like planting techniques and soil fertility. These events usually last up to an hour . And the plant doctors repeat them several times in one region for a few days.

How are the rallies helping plant health in Burundi?

In Burundi, Plantwise has held the rallies in over 60 locations in Citiboke, Gitega and Ngozi. The Institute of Agricultural Sciences of Burundi (ISABU) and Burundi's Ministry of the Environment, Agriculture and Livestock worked with Plantwise to hold the rallies that have reached over 5,000 farming households on plant health problems attacking priority crops. These included the Banana Xanthomonas Disease and Late blight of Potatoes. It also covered *Tuta (phthorimaea) absoluta* in tomatoes and fall armyworm in maize.

Dr Alfred Niyokwishimira, Director General - ISABU commented on how plant health rallies are essential for empowering farmers. He talked about how they give farmers the knowledge and tools they need to manage their farms. And he explained how they help them grow crops to feed their families and communities. But they also help the farmers feed the country as a whole, as agriculture is an integral part of Burundi's economy.

Plant health knowledge is critical for people working in agriculture

Dr Célestin Niyongere, the Plantwise coordinator in Burundi explains that with help from local plant doctors through rallies, farmers can address plant health challenges.

"*We are confident that these interventions will have a lasting positive impact,*" said Dr Niyongere. He noted that Plantwise had also trained farmers in safe and sustainable pesticide use. This is important for food safety and also for the health of farm workers.

Empowering farmers with plant health in Burundi

CABI has also partnered with AUXFIN in Burundi to empower over 400,000 farming households using an app called AgriCoach. This app helps smallholder farmers to improve their agricultural production and income. It does this by providing them with farming knowledge. The information covers the types of crops to grow, the best times to grow them and best practices for sustainability.

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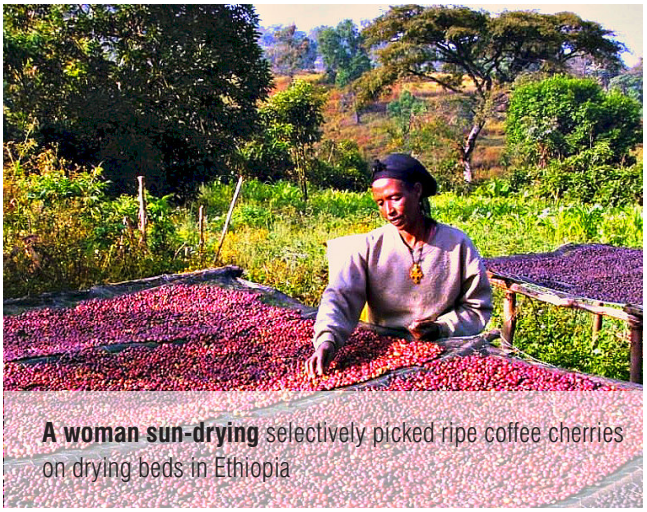
Promoting women's role in coffee's value chain in Ethiopia



A woman sun-drying selectively picked ripe coffee cherries on drying beds in Ethiopia

A new CABI-led study published in the journal Sustainability suggests that the role of women in coffee production should be promoted across the whole value chain as well as improving their access to productive resources and services.

The study found that while some of the technologies and practices promoted to increase coffee harvesting and primary processing brought positive benefits for households – by improving coffee quality, market access and their income – it has mixed outcomes for women.

Although women were not primarily targeted by measures to improve coffee processing and quality, their role and participation in implementing the improved coffee harvesting and processing technologies/practices nevertheless fostered women's skills, confidence and decision-making power.

The research also found that some of the new technologies/practices needed extra work thus adding to women's workload, while others saved labour and eased their work. As a result of increasing the wholesale

trading of coffee, the role of marketing the product appeared to largely shift to men.

Dr Negussie Efa Gurmessa, Scientist and Programmes Manager and a lead author on the paper, said, "*This study examines sustainability and gender dynamics of coffee value-chain development intervention in Ethiopia. It underscores the need for a proper gender analysis and embedding gender-sensitive approaches in designing development interventions to ensure women's fair representation, and thus equitable and sustainable benefits*."

Dr Morris Akiri, co-author of the study and Senior Regional Director for CABI Africa, noted that the initiative under study is one of the value chain development interventions where a public-private partnership was employed, tested and proved to generate positive results and experiences and lessons that can be replicated.

Co-author of the study, Dr Dannie Romney, CABI's Senior Global Director, Development Communication and Extension, said, "*Following the end of the project and the temporary market linkage, some male farmers devised mechanisms to continue accessing higher value markets, which the female farmers were not able to do.*

"*If male and female farmers are to sustainably benefit, value chain development efforts should not solely focus on short-lived arrangements nor be gender-blind as the outcome of such interventions can undermine gender equalities*"

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Institutional and policy bottlenecks to Integrated Pest Management

A farmer with a local remedy to fight pest of maize (Credit: CABI)

A new publication led by CABI has highlighted institutional and policy bottlenecks to using Integrated Pest Management (IPM) to fight a range of potentially devastating crop pests in Africa.

Lead author Dr Roger Day and a team of researchers from Michigan State University, the University of South Africa, the University of Nairobi and the African Union Commission, identify several areas where policy hinders IPM.

Regional and national agricultural policy often prioritises production and productivity above environmental sustainability. In this policy context, it's not surprising that synthetic pesticides have become the default pest-control method for many farmers.

Agricultural research is generally underfunded in Africa, but evidence shows agroecological research, including IPM, is particularly lacking support.

Farmer training and access to advice is usually necessary for the uptake of IPM, so extension policy affects adoption. IPM is said to be "knowledge intensive", so face-to-face extension methods are the most effective, but they are expensive and extension systems may be poorly funded.

Policies around credit, insurance and subsidy also affect farmers' choice of pest control method, and the authors note that when Fall Armyworm arrived in Africa, many governments provided free pesticides, so encouraging chemical control.

Additionally, food safety regulations and market standards can incentivise the use of IPM, particularly when there is effective compliance monitoring and capacity to meet the standards. Regulatory systems for chemical pesticides, seeds, biopesticides and biological controls can encourage or constrain the adoption of IPM by affecting input availability and cost.

Finally, how policy is developed can be improved by providing greater opportunities for participation in policy processes by stakeholders, particularly farmers. Research to support agricultural policy in IPM and related areas is often lacking.

The authors conclude that: "*Ultimately, the best chance for securing an enabling policy environment is for IPM to be seen not as a fire-brigade response to a problem, but as a key element of the food-system transformation.*"

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