

*Compendium of impacts - report for Sida
December 2025*

AgriFoSe2030 phase II 2018-2024

Compendium of impacts



Photo: Ng'endo Machua Muniu

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The synthesis of narratives from AgriFoSe2030 project reports and programme evaluation documents was led by Selorm Kugbega, Brenda Ochola, and Lovisa Hast (SEI Intern).

List of Abbreviations

AKIS	Agricultural Knowledge and Information Systems
ARC	Agricultural Research Council
B2C	Vietnam's business-to-customer
BMP	Better Management Practices
BSF	Black Soldier Fly
CABI	Centre for Agriculture and Bioscience International
CUT	Chinhoyi University of Technology
DAEC	Department of Agricultural Extension and Cooperatives
DALRRD	Department of Agriculture, Land Reform and Rural Development
DES	Digital Extension Services
DW TV	National TV-station Zimbabwe
FAO	Food and Agriculture Organization of the United Nations
FMNR	Farmer managed natural regeneration
GenSens	Gender-sensitive village extension training in Tanzania
HUAF	Hue University of Agriculture and Forestry
JICA	Japan International Cooperation Agency
KAP	Knowledge, Attitudes, and Practices
KEPHIS	Kenya Plant Health Inspectorate Service
MARD	Vietnam Ministry of Agriculture and Rural Development
MATIs	Ministry of Agriculture Training Institute
MEL	Monitoring, Evaluation and Learning
MER	Mt. Elgon Region, Uganda
MUFPP	Milan Urban Food Policy Pact
NDMA	The National Drought Management Authority, Kenya
NGO	Non-governmental organization
NLU	Nong Lam University
PAFO, DAFO	Provincial and District Agriculture and Forestry Offices
PCPB	Pest Control Products Board
PRA	Participatory Rural Appraisal
RSM	Rice straw management
RUFS	Resilient Urban Farming Systems
RUPP	Royal University of Phnom Penh
SASUF	South Africa - Sweden University Forum
SEA	Southeast Asia
SEI	Stockholm Environment Institute
SIANI	Swedish International Agriculture Network initiative
SLU	Swedish University of Agricultural Sciences
SSA	Sub-Saharan Africa
ToC	Theory of Change
ToT	Training of trainers
TRAMAP	Transformative Rangeland and Management Practices
UoN	University of Nairobi
USAID	U.S. Agency for International Development
WMI	Wangari Maathai Institute for Peace and Environmental Studies, University of Nairobi

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Section 1: About AgriFoSe2030

Rationale for AgriFoSe2030

Despite widespread economic growth and significant progress on poverty reduction, food insecurity and nutrient deficiencies remain daunting challenges in many parts of the world. The number of people suffering from hunger is on the rise, and two-thirds of the global extreme poor depend on agriculture for their livelihoods. The challenge of achieving food and nutrition security (SDG 2) is particularly severe in sub-Saharan Africa (SSA) and South and Southeast Asia (SEA), where smallholder farmers produce around 80% of the food consumed. Transforming smallholder farming systems in these regions to become more productive, profitable and sustainable is therefore essential to achieving SDG 2. This transformation is however complex and may have both negative and positive outcomes. The magnitude of the challenge is compounded by climate change and loss of natural ecosystems which pose serious threats to global food and nutrition security.

Any agricultural transformation agenda needs to be hinged on science-based and well-crafted government interventions, policies and improved agricultural practices in order to achieve lasting impact. Science and scientists therefore have a crucial role to play in this transformation process and in supporting vulnerable and poor people, e.g. smallholder farmers in meeting future food and development demands. However, this will require going beyond traditional academic research and finding ways to collaborate with policymakers and practitioners to jointly frame problems, generate new knowledge, and make science-based knowledge relevant to specific contexts.

The AgriFoSe2030 programme assists countries in SSA and SEA in strengthening their capacity to collaborate with diverse stakeholders and to synthesize and translate robust scientific evidence into policies and practices. These aim to accelerate the transition toward more sustainable food systems and contribute to improved food security. By utilizing a knowledge co-creation approach, the programme brings together a network of researchers, practitioners, and policymakers to develop context-specific solutions that are grounded in local knowledge and expertise.



Fig 1. A schematic illustration of how researchers from target countries and Sweden within AgriFoSe2030 collaborate and build capacity to synthesize, communicate and co-create scientific data and research findings in dialogue with various stakeholders, in support of evidence-based decision-making and improved practice, with the end goal of reaching SDG 2.

Theory of Change in AgriFoSe2030

To achieve its objectives, the AgriFoSe2030 programme applies a Theory of Change (ToC) approach- a systematic methodology for finding and enabling pathways to change. The ToC outlines clear impact pathways that guide the programme toward its desired goals. Using the ToC approach helps teams identify and assess the assumptions and risks that underlie anticipated causal linkages in the pathway of outcomes. It is intended to be adaptive, allowing for revisions to reflect the dynamics of the implementation context. Up until 2024, the programme worked through two pathways to create impact; first through 17 change projects that practically illustrate science translation processes and their contributions to changes in policy and practice and secondly, strengthened researcher capacities in science translation. The outcomes of the programme were harvested through multiple monitoring evaluation and learning tools including after action reviews, change stories, outcome harvesting and periodic internal and external evaluations.

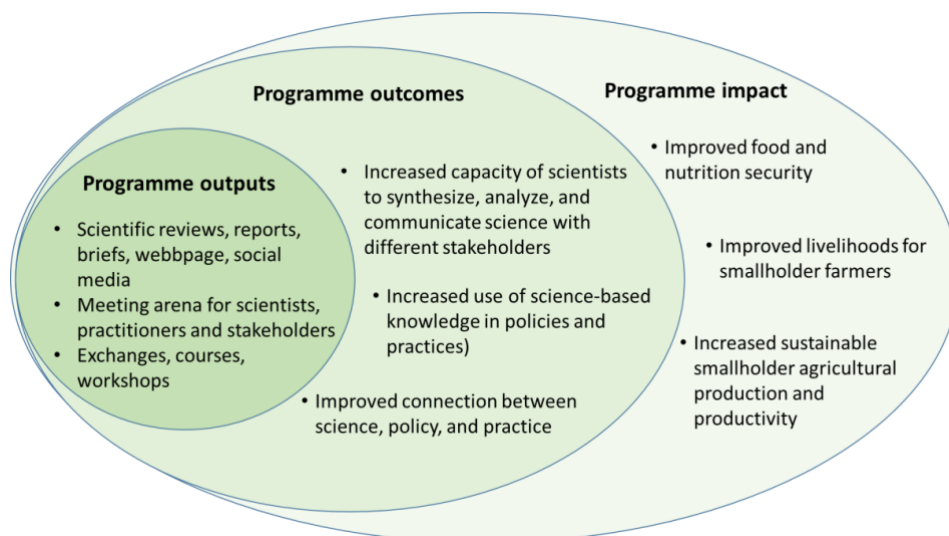


Fig 2. AgriFoSe2030 Programme Theory of Change

AgriFoSe2030 challenge areas

Within the programme period covered by this report (2018-2024) AgriFoSe2030 aligned its workplan with the “Strategy for Sweden’s global development cooperation in sustainable economic development 2018-2022”, with an emphasis on sustainable agriculture production and food security. In phase two (2020-2024) for example, this work was organized into four cross-disciplinary, solution-oriented “AgriFoSe2030 Challenge areas” identified in consultation with partners in SSA and SEA; i) Improving access to safe and nutritious food, ii) Agriculture productivity and ecosystem functions, iii) Science-based innovation and extension, and iv) Smallholder rural and structural transformations. Within each challenge, there were approximately four illustrative change projects that showcase practical science translation processes for addressing prioritized issues.

Challenge 1. Improving access to safe and nutritious food

This challenge area aimed to improve access to safe and nutritious food by tackling pre- and post-harvest losses, enhancing food safety, and strengthening market access for smallholder farmers, particularly women, in SSA and SEA. The goal was to ensure that households in underserved communities can access safe and nutritious food while connecting them to markets that boost their incomes and productivity. Additionally, the initiative addressed risks associated with foodborne diseases. The challenge area included four change projects.

Challenge 2. Agriculture productivity and ecosystem functions

This challenge area focused on sustainably increasing agricultural productivity while maintaining and enhancing ecosystem functions. It addressed the dependence of farming systems in SSA and SEA on vital ecosystem services such as soil fertility, water regulation, biodiversity, and climate stability. The goal was to help smallholder farmers overcome low yields, land degradation, and climate change impacts by adopting sustainable practices that protect natural resources vital for agricultural production. This includes promoting diversified production, improved agronomic techniques, community empowerment, incentives for ecosystem management, secure land rights, and better access to markets. The challenge included five change projects.

Challenge 3. Science-based innovation and extension

This challenge area focuses on strengthening the links between science, innovation, extension services, and on-farm adoption to improve smallholder productivity and sustainability. It addresses the weak and outdated extension systems in SSA and SEA, which often fail to incorporate new scientific and technological advances or adapt recommendations to local conditions. The aim is to enhance connections between researchers, innovation actors, extension agents, and farmers to ensure effective knowledge transfer and practical application. Special emphasis is placed on improving access to science-based technologies and extension services for women, youth, and vulnerable groups, as well as understanding how specific interventions can promote sustainable agricultural practices in small-scale farming systems. The challenge area included four change projects.

Challenge 4. Smallholder rural and structural transformations

This challenge area focused on understanding and addressing the social and economic transformations shaping smallholder agriculture in SSA and SEA. It examines how rapid population growth, urbanization, economic change, and shrinking farm sizes create both challenges and opportunities for rural development. The goal is to generate science-based insights to guide policies and practices that support inclusive, sustainable livelihoods for smallholders across diverse geographic and socioeconomic contexts. Key focus areas include analyzing trends in farm size and structure, promoting gender and generational equity, and improving smallholders' access to land, finance and markets. The challenge area included four change projects.

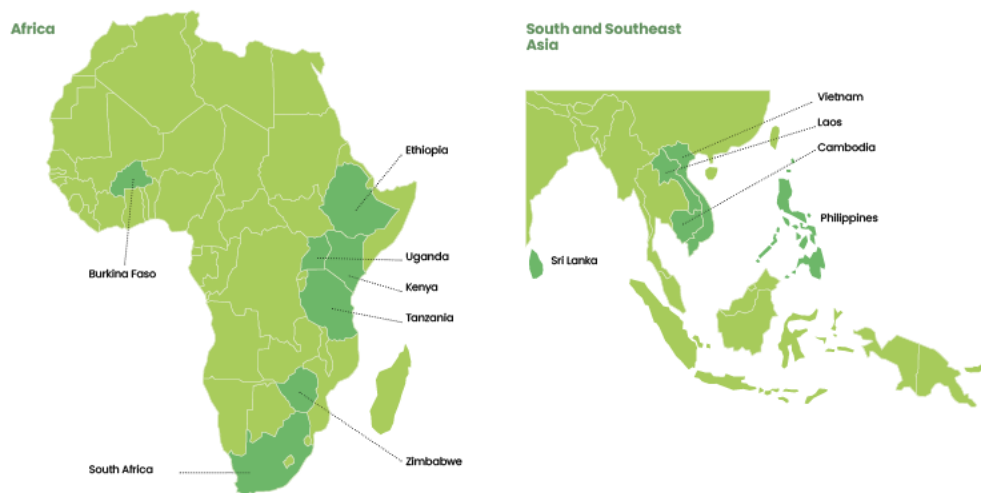


Fig 3. AgriFoSe2030 partner countries in phase two.

Section 2: Impact narratives from AgriFoSe2030 change projects

Challenge 1: Improving access to safe and nutritious food for smallholder farmers

Project

Smallholder goat production in Laos – improving quality of extension services and access to markets

Location and Duration

Location: Vientiane capital and Bolikhmaxay province, Laos PDR

Duration: 2021-2024 (3 years)

Challenge

Many smallholder households in Laos are engaged in goat production, but they often experience herd losses due to poor management and nutritional deficiencies. These challenges reduce animal live weight and quality, making it difficult for farmers to meet market quality standards. The project introduces new livestock management practices, focused on enhancing goat production in Laos. It aims to improve the quality of extension services and market access for smallholder goat farmers, ultimately improving production and increasing consumer access to goat meat.

Intervention/Approach

The project provided trainings on best practices for goat production and market access and facilitated knowledge exchange among farmer groups. This included trainings on constructing goat pens, producing mineral blocks, vaccination and deworming, establishing pastures, and growing legumes to improve fodder quality. The team also hosted workshops, implemented animal health campaigns, and conducted surveys on demand and supply of goat production, aiming to connect smallholder producers with existing goat market opportunities.

Impact (on policy and practice)

In total, the project activities reached 495 participants in 2021 and 551 in 2022. A total of 129 goat farmers from 13 villages across six districts actively participated in the practical trainings, gaining new knowledge and hands-on skills in sustainable goat husbandry. 11 farmer groups were set up as farmer field schools with demonstration farms to implement trainings and facilitate knowledge exchange. Farmers are now applying these learnings in tangible ways such as cultivating grass and legumes to improve fodder quality, resulting in the rehabilitation and sustainable management of approximately 17 hectares of pasture. The farmer groups also pooled their resources to construct 37 improved goat pens, enhancing animal welfare, while 52 farmers invested in improved goat breeds. Vaccination, deworming, and mineral and vitamin supplementation benefited 2,722 goats in total.

Demand for high quality goat products from smallholder producers in the Vientiane capital and Bolikhmaxay province has grown with farmers engaging with new market actors such as restaurant owners. Previously these buyers sourced goats exclusively

from Thailand and Vietnam due to quality specifications. One trading agreement was reached between one goat trader and 22 farmers starting with a successful pilot of fattening eight goats for four months and conducting meat quality tests together with 45 policy makers to help refine the fattening process. To ensure continued market access, digital platforms (WhatsApp and Facebook) were created to connect farmers and goat traders.

A key achievement has been the strengthened capacity of 76 agriculture and extension staff in participatory training methods and technical expertise in sustainable goat farming. These extension officers report better understanding and increased confidence in guiding farmers to produce mineral blocks, silage and build improved goat pens, ensuring continued support and knowledge dissemination beyond the project period. They have also utilized the knowledge gained together with the co-created materials (booklets, posters and videos) in providing extension support to new areas. Beyond the primary target group (farmers), one extension officer has integrated knowledge gained from the project in his long-term training final report while one of the members of the AgriFoSe2030 project team was inspired to start his own goat farm.

The programme's impact is also demonstrated by its independent expansion, with the Agriculture Centre Services in Oudomxay province recently using co-developed training manuals and applying project techniques on building goat pens, mineral blocks and vaccination throughout the Northern region of Laos, significantly widening the dissemination of project interventions to new regions in Laos.

Overall, farmers report improved productivity and income through healthier animals that meet market requirements. The project has also catalyzed peer-to-peer learning through the formation of new farmer groups, strengthening community cohesion and fostering a culture of continuous knowledge sharing. Researchers, goat farmers, extension officers from the Department of Agricultural Extension and Cooperatives (DAEC), and representatives from Provincial and District Agriculture and Forestry Offices (PAFO and DAFO) worked closely together throughout the implementation. This collaborative model has created a framework for goat extension service delivery and knowledge diffusion.

Quotes from stakeholders (farmers, policymakers, researchers)

“Before the goat research and extension project came to be promoted in my village, I raised goats based on free range grazing systems, without any feed supplementation and health care. Since 2021 we were trained on best practices in goat farming and I have started changing my goat pens and establishing pastures, vaccinating and providing mineral blocks for the goats. I can see that my goats are healthy, fat and reproduce quickly. By the year 2026, I plan to increase the number of female goats up to 100 so I can produce 100-200 goats per year for sale” - Farmer group member in Donexath village, Khamkerth district, Bolikhamxay province.

“This programme of translating sciences to practices is a crucial investment in our national agricultural strategy. By equipping our extension officers with targeted technical skills, like those for productive goat farming, we are directly empowering our farmers to increase their output and maximize economic benefits.” - former Director of Department of Agricultural Extension and Cooperatives.

Media and communications

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Link to Facebook page on goat research and extension: <https://www.facebook.com/profile.php?id=100083169559108&sk=photos>



Goat Vaccination



Goat Pasture



Improved Goat Pen





Exchange visit to facilitate knowledge sharing on improved goat management practices

Project

Improving market access and scaling up trading of safe and nutritious edible insects by women and youth in Zimbabwe

Location and Duration

Location: Zimbabwe - Chinhoyi town

Duration: 2019-2024 (5 years)

Challenge

Edible insects form a major part of diets in Zimbabwe, providing a cheap source of protein and vital micronutrients. However, the sourcing and marketing of edible insects has remained rudimentary with major food safety risks while knowledge of the particular nutritional benefits of edible insects has remained low. This project seeks to improve sustainable harvesting and marketing of edible insects while empowering women and youth as key market actors. The project provides knowledge on innovative insect dishes, safe insects processing and sustainable sourcing.

Intervention/Approach

The project implemented capacity-building activities including training insect collectors and traders in insect farming, safe handling, processing and storage. They also received training on insect value-addition, particularly mealworms and crickets, to empower women and youth to create new insect-based products. To ensure product quality, food composition analyses were conducted to verify the nutritional value and safety of

innovative edible insect food products. To promote food safety and knowledge sharing, the project used learning experiences from engagements with chefs on developing innovative insect dishes and trainings with traditional leaders, youth and women to develop tailored training resources, including Zimbabwe's first "Edible Insects Food Safety Manual" to facilitate continued trainings. To raise public awareness and market visibility, the project showcased edible insect products at national food and agriculture trade fairs, positioning them as both nutritious and marketable foods. In addition, the project sought to improve market access and connectivity, by developing and piloting a mobile application, "E-Madora," which links traders and consumers in the sale and consumption of edible insects.

Impact (on policy and practice)

The project has led to the establishment of a model insect farming facility at Chinhoyi University of Technology which has trained 120 participants in edible insect farming. This is a sustainable approach to ensure augmentation of wild harvesting of insects and a way to reduce overharvesting of wild populations and minimize the impact of insect seasonality. Three formal insect collection and trading groups namely, the Gwanda mopane worm group, the Bikita edible insects' group, and the Chinhoyi Municipality traders' group, were formed and provided with trainings on insect harvesting, handling, processing and storage. These groups established formal working relationship with regulators such as the Forestry Commission of Zimbabwe, contributing to the formalization of their activities.

With increased engagements, the project received a donation of a parcel of land from local government actors in Chinhoyi for the establishment of the Chinhoyi edible insects' market, creating the first formal and specialized space for insect trade in the district. Traders have continued using the market since its construction in 2019, an indication of its capacity to sustain their insect business. The Chinhoyi insects' market, equipped with storage and open market stalls allowed for direct supply of insects from collectors, contributing to the sustenance and growth of insect collection and trading businesses. The insects' market has further increased interactions between insect collectors, traders and regulators including representatives from the Forestry Commission of Zimbabwe, Gwanda and Lupane district councils, Gwanda Rural District Council, and Chinhoyi Municipality. Interactions with the Standards Association of Zimbabwe has led to the formation of a national steering committee, including AgriFoSe2030 researchers from Chinhoyi University of Technology (CUT), to initiate steps for developing edible insect food standards in Zimbabwe. With this increased recognition, the government of Zimbabwe has officially in 2025, through the public service commission, recognized edible insects for food and feed as a key priority research area for the Ministry of Higher & Tertiary Education, Innovation Science & Technology Development. The project's mobile-based application, *E-Madora*, developed to link insect collectors with traders and consumers, is also under consideration for trademarking and patenting.

Through targeted training and communication outreach, approximately 3000 women and young people in Zimbabwe have strengthened their knowledge and skills in edible insects harvesting, handling, marketing and business development. They are now better equipped to sustainably operate and expand insect-trading enterprises and to produce

safe, nutritious insect-based foods. As a result, these innovative products have gained widespread popularity, offering consumers a diverse range of nutritious food options while offering new livelihood opportunities to improve the incomes of local traders. Several enterprises, such as Dulsie Kys Cooking School, CUT Hotel, Orange Grove Motel and CUTFoods now produce value-added products like ready-to-serve edible insects, protein and energy snack bars, and savory crackers. In addition, the project has developed three innovative insect-based products targeted for rural and urban markets, school feeding programmes or snacking for children which are currently being considered for trademark registration.

The project, in collaboration with renowned chefs, published two award-winning Edible Insects cookbooks, incorporating indigenous knowledge of kitchen stories and principles of modern cuisines. The cookbooks, which won global Gourmand awards in 2022 and 2023, have contributed to the dissemination of innovative edible insect recipes worldwide. Increased awareness through media engagement and production of communications materials (films, booklets) has highlighted the benefits of insect consumption and improved uptake of edible insect products in restaurants and hotels and made them a key part of the signature dishes of renowned chefs. Some high-end restaurants in the most popular destinations of Harare and Victoria Falls in Zimbabwe are already awarding certificates to tourists who taste their signature dishes based on mopane worms. This has cascaded down to the insect collectors (Bikita and Gwanda groups) who now receive premium prices for mopane worms as they get orders to supply these high-end markets. Notably an engagement with chefs on showcasing innovative insect dishes was aired on National television in Zimbabwe and on DW TV increasing the knowledge of edible insects as a sustainable source of protein and micronutrients. As part of dissemination, engagement, knowledge sharing and developing a critical mass of stakeholders the project hosted the first African edible insects conference in Harare.

Overall, three major insect collection and trading communities have been empowered to scale up their businesses and champion insect preservation stewardship in their localities.

Quotes from stakeholders (farmers, policymakers, researchers)

"The edible insect energy bars are surprisingly tasty! I'm already telling my friends about them and think they should be marketed to gyms and other fitness centers." - A customer at the Zimbabwe Agricultural Show

"I never thought I'd eat crickets but having them in a product we are used to consuming really won me over. It's a good way to introduce people to edible insects." - A customer at the Zimbabwe Agricultural Show

Media and communications

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Chinhoyi Edible Insects market



Selected Insect Dishes from the Edible Insects Cookbooks



Value Added Insect Products

Project

Gender-Based Approaches for improving milk safety, value addition and marketing among smallholder livestock farmers in western Uganda.

Location and Duration

Kiruhura district, western Uganda

Duration: 2021-2024 (3 years)

Challenge

In Uganda, many women are involved in animal husbandry and dairy production, yet they face multiple structural barriers, reinforced by patriarchal norms that limit their control and benefits from livestock enterprises. Their participation remains largely confined to low-income and labour-intensive activities, such as cleaning milking utensils, traditional processing of milk into ghee and butter, and maintaining milking areas. Men, on the other hand, typically undertake the more profitable activities such as milking, and marketing of milk and livestock products. This is partly because cattle are traditionally regarded as male-owned assets, and women's roles in animal husbandry are often viewed as extensions of domestic labour rather than economic participation. Additionally, seasonal fluctuations in milk production cause wastage during high productivity periods while local milk collection centres often lack sufficient cooling and storage facilities, leading to spoilage. Although value addition offers a viable strategy to reduce losses and increase incomes, most women continue to rely on traditional processing methods that compromise product safety and quality. The project aims to improve women's participation in the production, value addition and marketing of safe milk and milk products hence increasing household incomes and food security.

Intervention/Approach

The project trained women in safe milk production, value addition and market access. Awareness-raising meetings with key stakeholders were held and field surveys were conducted to collect data on dairy product safety practices along production and marketing channels and identification of key gender issues based on field

experiences. Women farmer associations and groups focusing on milk products were formed and supported, alongside efforts to connect them with milk buyers, processors, and policymakers to strengthen market access. Women's farmer groups also received financial management training and were organized into Village Savings and Loans Associations (VSLA) and market groups to ensure financial sustainability and long-term empowerment.

Impact (on policy and practice)

As a result of awareness workshops in the communities many women were incentivized with the support of men to acquire milk themselves, challenging preexisting patriarchal structures that prevented women from seeking a share of milk yields. Through trainings delivered, many women acquired skills to transform milk into marketable products with extended shelf lives, such as cheese and yoghurt, thereby creating sustainable and competitive businesses. Products were sold both in local markets and in large cities including Kampala. Households report increased incomes due to women's empowerment in milk value addition. Incentivized by the new business opportunity, one women's group in Kinoni Sub-county established a milk processing facility, set up outlets for marketing value addition products and secured small equipment for production and storage of milk value addition products.

Men were initially resistant, fearing that empowering women might threaten their marriages. However, the project team emphasized that the project's focus was on development and increasing household income, not disrupting homes. Some changes in perspective have been observed, including a readiness to let go of certain cultural beliefs that subjugate women and an increase in trust between men and women. This contrasts with the earlier attitude seen at the start of the project, when women were often prevented from engaging in the more profitable aspects of livestock production. By involving male counterparts early on, men were able to develop trust in the project and support for their spouses. Interestingly, some men have shown interest in investing in these products, especially during months when milk prices are considerably low. Organizing the women into functional groups (Village Savings and Loan Associations) proved to be a sustainable strategy for improving market access for certified value-added milk products.

Quotes from stakeholders (farmers, policymakers, researchers)

"This project has given me development ideas and opportunities that I had never thought about; it's better I participate so that I improve the welfare of my family and the community at large." - Male community member

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Trainings on Milk value addition



Kinoni Milk processing facility



Awareness Campaign at Radio Station

Project

Application on Black Soldier Fly (*Hermetia illucens*) rearing technology as a tool to improve environment safety, sustainability and rural development in South of Vietnam: Emphasis on aquaculture production

Location and Duration

Location: Vietnam (Ho Chi Minh City, Long An, Đồng Nai, and Tiền Giang provinces)
Duration: 2022 – 2023 (16 months)

Challenge

Vietnam's livestock and aquaculture industries rely heavily on fishmeal as a key feed ingredient, however rising feed prices have become a major constraint to growth. Aqua feed prices in Vietnam [increased by 15-30% in 2021 compared to 2020 levels](#). Because feed represents [over 50% of aquaculture production costs](#), any price fluctuation directly raises production expenses, reduces competitiveness, and increases financial risks for farmers. Limited access to high-quality, affordable feed prevents farmers from expanding production and often results in reduced profits. Additionally, import dependence on fishmeal not only reduces competitiveness but also increases vulnerability to global market fluctuations. In parallel, large volumes of agricultural waste, household waste, and food-processing residues that could be utilized in circular production systems remain underutilized and contribute to pollution and greenhouse gas emissions. Black Soldier Fly (BSF) larvae offer a sustainable alternative protein source for aqua feed production. They can be safely reared and efficiently convert organic waste into high-value protein ($\geq 40\%$) and fat ($\geq 20\%$) and can significantly reduce feed costs. Their strong waste-to-protein conversion capacity, rapid growth, and suitability for tropical climates make BSF particularly appropriate for small-scale household models in the Mekong Delta and surrounding provinces. Additionally, BSF residue (larvae manure/ frass) is a useful organic fertilizer. Insects also have a small environmental footprint, emitting only a fraction of the greenhouse gases produced by livestock, requiring minimal land and water, and efficiently recycling organic waste. The project aims to introduce BSF larvae as a sustainable, cost-effective protein source for aquaculture and larvae manure as an organic fertilizer source for crop production.

Intervention/Approach

The project aimed to introduce and expand BSF rearing practices among farmers, local authorities, and extension officers in Southern Vietnam as a low-cost, sustainable solution for transforming organic waste into high-quality protein feed and nutrient-rich fertilizer (frass). This approach enables households to reduce production costs, recycle waste efficiently, and transition toward more circular agricultural systems. This includes increasing technical capacity for waste-to-feed conversion, establishing integrated BSF–fish farming models, promoting the use of BSF manure as organic fertilizer, strengthening farmer cooperation through group formation and raising public and policy-level awareness of BSF technology's benefits and its contribution to circular agricultural development. To achieve this objective, our approach included a comprehensive survey to assess farmers' knowledge and current practices related to BSF-based aquaculture

feed systems. This survey examined aquaculture techniques, farmers' prior knowledge of alternative proteins, and the availability of organic waste for BSF production, providing insights into existing conditions and identifying opportunities to improve and optimize BSF farming in an environmentally friendly manner. Information on fish farming practices that incorporate BSF, including fish yields and quality, were also collected to guide the development of effective integrated BSF–fish farming models. These findings informed the design of training materials and ensured that demonstration models reflected real on-farm conditions.

Trainings were conducted to enhance BSF production techniques among both extension officers and smallholder farmers, aiming to improve the quantity and quality of BSF output and help meet feed demand in integrated fish–BSF systems. Training covered BSF biology, egg incubation, adult breeding, substrate preparation, waste management, hygiene, and fish feeding applications. Further training included application of agricultural residues, household and animal waste preparation for larvae rearing and basic knowledge on market conditions for insect proteins. Demonstration pilots in Long An, Tien Giang, and Ho Chi Minh City were established to showcase best practices and new technologies in BSF rearing, residue utilization, and feeding BSF larvae to fish, including technical norms and resulting yield and quality improvements. They showcased low-cost rearing systems and methods to incorporate BSF larvae into aquaculture diets, waste reduction, and feed cost savings, attracting interest from neighboring communities. These practical demonstrations allowed participants to observe each stage firsthand, increasing confidence and reinforcing knowledge gained.

In parallel, the project organized extension and veterinary services officers into a collaborative network aiming to facilitate knowledge sharing and coordinated support to farmers. Following trainings, farmer groups were formed to increase access to new technologies, promote knowledge exchange and support farmers in procuring materials and investments for scaling their operations. Stakeholder workshops were organized at the beginning and end of the project to align understanding, share results, and evaluate progress. Communication efforts also supported the entire project through dissemination of experiences, best practices, and technical guidance on online platforms such as the Nong Lam University (NLU) website and LinkedIn pages.

Impact (on policy and practice)

The project contributed to advancing the adoption of BSF technology among rural households in Vietnam by training 811 project participants on how to apply BSF rearing technologies. Hands-on training proved essential for adoption, particularly when combined with demonstration sites that allowed farmers to observe and replicate practices on their own farms.

Practical application through demonstration farms improved knowledge and recognition among farmers, extension staff and local authorities of BSF as a promising technology for recycling organic waste, generating low-cost animal and aquaculture feed, and producing organic fertilizer. Environmental improvements were noted as farmers began

collecting and sorting otherwise discarded waste from their homes, farms and community –based small-scale processing facilities to optimize black soldier fly production and frass collection for application as organic fertilizer. These shifts reduced unmanaged waste volumes in farms, households and small processing facilities, contributing to a cleaner and more sustainable environment.

Extension officers and local authority representatives benefited from exchange-study workshops where they learned skills in the construction of BSF breeding cages, farmer group management, and effective communication strategies. They reported enhanced capacities and confidence to guide farmers in managing integrated BSF–fish systems and to coordinate support across districts building on their knowledge of BSF utilization in livestock and poultry feed. A related achievement of the project has been active engagement and strengthened collaboration among stakeholders. Extension staff at national, provincial, and district levels formed strong networks which enhanced knowledge sharing, support for farmer groups and created a foundation for long-term BSF technology adoption for aquaculture systems. With more structured support, more farmers became interested in joining project activities, interacting with each other, and adopting improved BSF techniques. Additionally, the formation of farmer groups enhanced peer learning, resource sharing, community cohesion and long-term collaboration.

The baseline survey and accompanying training video, produced jointly by the Swedish University of Agricultural Sciences (SLU) and NLU, proved highly impactful and became a widely used extension tool, increasing public visibility on sustainable protein sources for aquaculture in the Mekong region. The video which featured on Ho Chi Minh City Television offered guidance on BSF rearing and demonstrated its value as a sustainable protein source for aquaculture in the Mekong region. This significantly improved farmers' understanding of BSF-based feed systems.

Field observations show that households adopting BSF technology experience lower feed costs by substituting part of aquafeed with BSF larvae and modest income improvements through the sale of larvae and frass, but limited widespread knowledge of BSF breeding, feeding, and management still constrains broader economic gains. Even so, the project has demonstrated to participants the clear potential of BSF adoption to create new income opportunities for rural households through sustainable waste recycling, feed production, and the use of BSF manure as organic fertilizer.

The project contributed, through researchers and participants, to the launch of a major government-supported BSF initiative in Vietnam namely the Ho Chi Minh City Low-Carbon Agriculture Project (2024–2026). The project team has also been contacted by the Japan International Cooperation Agency (JICA) group for discussions on a potential future project in the Mekong Delta focusing on BSF production for methane mitigation. These initiatives demonstrate increasing recognition of BSF as a strategic tool for low-carbon development and waste recycling.

Quotes from stakeholders (farmers, policymakers, researchers)

“Before the training, I didn’t know how valuable our daily waste was. Using BSF, we now turn kitchen and farm residues into feed and fertilizer. It cuts costs and keeps the farm cleaner.” - Farmer, Tan Hưng District, Long An Province

“BSF farmer groups have become active learning hubs. We see strong potential to develop official cooperatives linked to feed companies in the coming years.” - Senior Extension Specialist, Tiền Giang DARD

“BSF aligns with our new waste-to-resource strategy. It addresses methane reduction, feed autonomy, and rural income- three priority areas for 2025–2030 provincial planning.” - Provincial Planning Officer, Mekong Delta Region

“I used to throw away most household waste, but now I turn it into BSF feed. My fish feed costs dropped sharply, and I feel more confident managing the system myself”. - Female Farmer, Tiền Giang Province

Media and communications

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Mentorship sessions to share knowledge



Challenge 2: Agricultural productivity and ecosystem functions

Project

Agroecological practices for restoring parklands. Co-producing science-based skills and knowledge for increased agricultural productivity

Location and Duration

Location: Nobéré, Saponé and Yako communes, Burkina Faso

Duration: 2021-2024 (3 years)

Challenge

In Burkina Faso, agroforestry parklands, an ancient and vital agricultural system that integrates trees, crops, and sometimes livestock, are facing increasing pressure from modern agricultural practices and climate change. Traditionally, these parklands have played a crucial role in maintaining soil fertility, conserving biodiversity, and enhancing farmers' resilience to climatic variability. However, since the modernization of agriculture in the 1960s, the introduction of improved crop varieties, mineral fertilizers, pesticides, mechanization, climate change and unsustainable tree harvesting pressures has led to significant environmental degradation within parklands. These changes have contributed to soil erosion, reduced tree density, pollution, and the overall decline of ecosystem services that sustain agricultural productivity.

The project seeks to address these challenges by leveraging innovative platforms (a digital and periodic in person learning platform linking smallholders, extension agents and local government officers) for promoting agroecological approaches tailored to local contexts while also addressing trade-offs between productivity and sustainability.

Intervention/Approach

The project focused on scaling up agroecological practices that enhance soil conservation, tree regeneration, and sustainable crop production while reinforcing farmers' adaptive capacity to climate change. Interventions were aimed at spreading agroecological practices to increase tree health, tree density, soil conservation and restoration. It included a baseline survey of 270 households across three municipalities on parkland production practices, dramatizations to share agroecological knowledge, the establishment of demonstration plots for practical teaching of agroecological parkland management practices, and training workshops and cost-benefit evaluations. Other interventions included raising awareness of agroecological practices and the problems associated with synthetic chemical use in parklands, as well as disseminating knowledge on agroforestry parkland management. Sensitization on agroecological practices and the risks associated with chemical inputs was carried out through village meetings, radio broadcasts, and the organization of Agroecological Days in each municipality. Local NGOs led these annual events, held at the start of the cropping season, which featured theater performances and public debates to encourage community participation. Two Agroecological Days were organized in each commune, and three interactive radio programmes in local languages were aired during the project to share key messages with a wider audience.

Across the intervention areas, 72 village meetings were organized, complemented by training sessions covering a wide range of topics. This included animal husbandry, focusing on feeding and manure collection for 220 participants comprising smallholders, extension agents, and local government representatives. For soil management, 112 farmers were trained on agroecological soil fertilization and the appropriate use of both chemical and biological pesticides. Trainings on farmer managed natural regeneration (FMNR) and tree management reached 120 farmers while residual biomass management trainings focused on composting reached 118 participants and 120 participants took part in trainings on sustainable charcoal production. To encourage learning by doing, ten demonstration plots focused on parkland cowpea production were established in each intervention of the 12 villages and additional ten plots each focused on maize and sweet potato production were established in eight villages in Nobéré and Saponé communes.

Impact (on policy and practice)

A total of 1200 smallholder farmers, including women and youth, were sensitized and engaged in agroecological practices, which enhanced their awareness and knowledge of parkland management. Additionally, demonstration plots allowed farmers to observe the benefits of agroecological practices first-hand. From these interventions, many participants expressed increased capacity to shift from conventional to agroecological farming and began sharing what they learned with other farmers in their communities. As a result, the target communities are now better equipped to promote community engagement in support of agroecology. This knowledge exchange has contributed to improved sustainability of parklands and greater productivity among smallholders.

Farmers, extension staff, NGOs, municipal representatives, and market actors worked together through innovation platforms which are spaces of trust created for knowledge sharing, and co-learning. This allowed diverse stakeholders to jointly develop and test new agroecological practices. One key outcome of these exchanges was the identification of priority activities for the scale-up of parklands agroforestry such as increasing the availability of agroecological inputs and enhancing the market value of agroecological products. Particular emphasis was placed on improving the shea value chain, a critical source of income for women. Women participants were trained to transform shea nuts into butter and subsequently into branded soaps, allowing them to produce higher-quality products with stronger market potential than traditional shea butter soap. This initiative not only increased women's incomes but also promoted the conservation of shea trees by enhancing their economic value. As a result, farmers have shown a stronger commitment to maintaining and regenerating shea trees within parklands, leading to the protection and nurturing of young tree seedlings and increasing tree density.

Extension agents from the agriculture, forestry, and livestock ministries have developed stronger agreement on sustainable parkland management through agroecological practices, largely due to interactions during innovation platform meetings and joint training sessions. These platforms provided an opportunity for cross-ministerial dialogue

on strategies for managing the environmental and health risks of chemical inputs and facilitating the long-term benefits of agroecological practices.

To ensure that agroecological practices continue beyond the lifespan of the project, participants from the three municipalities agreed to organize themselves into agroecological cooperatives. At the village level, these cooperatives bring together producers, traders, processors, and input suppliers across parkland value chains. At the municipal level, the cooperatives unite these village structures with local NGOs, extension services, and policymakers, fostering coordinated action. At the national level, discussions have been initiated to establish an umbrella organization to promote agroecology in agroforestry parklands, expand market access, and attract funding. This multi-level structure is designed to empower farmers to make decisions that improve their livelihoods, strengthen their access to skills and markets, and ensure long-term engagement and co-learning around agroecological practices. The cooperatives facilitate the availability of biofertilizers and biopesticides, developing markets for agroecological products to boost farmers' income, and maintaining spaces for experience sharing and co-learning. Each municipality also identified a team of farmer-trainers connected with extension and local government officers, who will continue to train other producers in agroecological methods and innovations, ensuring that knowledge continues to circulate and evolve within communities.

Quotes from stakeholders (farmers, policymakers, researchers)

"Thanks to the project's activities, we are convinced that if we do not apply agroecological practices, especially soil and tree preservation, our descendants will not have enough to eat and will suffer." - Farmer in Bakago, Nobéré Commune

"We have been working with the project for three years, and we really appreciate it because it allows us to exchange our experiences among the three communes (Saponé, Nobéré, Yako). We invite all stakeholders to adopt agroecological practices, which are beneficial for health, unlike the chemical products that are commonly used." - Member of Weogo-la-viim association, Nobéré Commune

"We appreciate the project, which brings us new knowledge and allows us to exchange experiences with the other two communes. Our role as foresters is to raise awareness among the population about the importance of trees, which are sources of provisions and protect against soil and landscape degradation." - Environment, Water and Forestry Agent, Saponé commune.

Media and communications

<https://www.youtube.com/watch?v=S-6M1axDkoQ>

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<https://www.youtube.com/watch?v=NX2L31M26Jg>



Trainings on Composting



Theatre on agroecological day

Soap-making training



Traditional shea butter soap

Shea butter soap after trainings

Project name

Sustainable rice straw management for improving farmer livelihoods and low environmental footprint in rice-based production system

Location and Duration

Location: Tien Giang and Long An Provinces, Vietnam

Duration: 2022-2023 (1.5 years)

Challenge

The intensification of cropping systems in Vietnam's Mekong region has led to a rapid increase in the volume of rice straw that must be managed within short periods before the next rice crop. Farmers commonly resort to open-field burning as the simplest and fastest solution. Although burning can help in pest control, it also contributes significantly to air pollution. This practice reduces opportunities for utilizing rice straw

for higher-value purposes such as livestock feed, mushroom production, composting, or mulching for crop improvement.

While rice straw has significant potential as a feed source for ruminants, its use is constrained by difficulties in collection, transport, and storage, as well as by its low protein content and poor digestibility compared to grass. Although various technologies such as physical processing, chemical pretreatments with urea or lime, and biological supplementation have been developed to improve its nutritional value and utilization, adoption remains limited. Barriers include farmers' lack of technical skills and inputs, uncertainty about benefits, and doubts regarding the suitability of these technologies for local conditions. Rice straw can also serve as a substrate for mushroom cultivation; however, high initial investment costs and the perception of low returns discourage farmers from adopting rice straw-based substrates.

A comprehensive value chain approach is essential to understand consumer acceptance and drive innovation in rice straw-based products. Such an approach can provide farmers with stronger economic incentives to move away from open-field burning, transforming rice straw from a waste product into a renewable resource that supports both agricultural productivity and environmental health.

Intervention/Approach

To address the widespread practice of open-field burning, the project introduced mechanized collection systems such as rice straw balers and harvesters. These machines enable efficient removal, compaction, and transportation of straw from the field, reducing labor requirements and lowering costs. Demonstration farms and trainings were conducted to promote the adoption of mechanized collection as a practical alternative to burning. Technologies for physical, chemical, and biological treatment of rice straw were transferred to improve its palatability, digestibility, and nutritional content. Physical methods such as chopping, soaking, and pelleting; chemical pretreatments using urea, lime, or ammonia; and biological treatments involving enzymes and microorganisms were introduced. Farmers were trained on the proper application of these technologies and on developing balanced feeding protocols that combine treated rice straw with other feed ingredients.

Trainings on producing substrates for mushroom cultivation were conducted together with demonstration farms to improve practical adoption of indoor mushroom cultivation. Furthermore, market research on fresh and processed mushroom products were conducted to increase market access, profitability and encourage investment. Mechanized composting, including the use of beneficial microorganisms, was promoted as an effective recycling method for wet or low-quality straw that cannot be used as feed or substrate. Finally, trainings were conducted to strengthen rice straw value chains by analyzing market systems, identifying bottlenecks, and enhancing coordination among key actors such as farmers, collectors, traders, and processors.

Impact (on policy and practice)

Through a series of trainings, workshops, and educational campaigns farmers, local authorities, traders, extension workers, and representatives from agricultural service

centers were introduced to a range of improved rice straw management options, including mechanized collection and removal, livestock feed production, mushroom cultivation, composting, and the use of organic manures in lowland rice systems.

Recognizing that rice straw has inherently low nutritional value, low protein content, and poor digestibility compared to grasses, the project team developed a formula using urea, lime, and beneficial bacteria to ferment straw. This treatment increases both its nutrient content and digestibility. The project successfully transferred this technology to 153 local farmers, who are now more skilled and aware of proper feed storage methods and the preparation of enriched rice straw feed for cattle, ensuring better feed availability throughout the year. A related outcome was the introduction of composting processes that combine rice straw with organic materials such as mushroom residues and cattle manure. Beneficial microorganisms were used to accelerate decomposition and enhance compost quality. Farmers and cooperatives received practical training on composting techniques and the use of compost as an organic fertilizer to improve soil health and reduce dependence on chemical fertilizers. Composting rice straw with animal manure and incorporating it into the soil helped recycle nutrients and contributed to increasing soil organic carbon.

In Thanh Tri commune of Go Cong Tay district (Tien Giang province), thirty rice farmers were repeatedly trained in improved mushroom production techniques. The project team worked directly with experienced local farmers to identify existing challenges in current cultivation practices and to co-develop practical solutions. Based on the findings, a Better Management Practices (BMP) manual that provides user-friendly guidance for farmers was developed. As a result, participating farmers have successfully applied improved techniques, increasing both mushroom productivity and income. Mushroom growers have also organized themselves into a producer association to share knowledge, share experiences, improve mushroom marketability and coordinate with traders. The mushroom producers' association was officially registered as a professional organization with 26 active members and has received strong support from The Thanh Tri Commune People's Committee and Go Cong Tay district authorities. These local governments view the association as an important step toward strengthening farmer collaboration and promoting sustainable local development.

The project has also strengthened the capacity of agricultural extension workers, enhancing their understanding and practical use of participatory approaches in rural development. Eighteen extension personnel from agriculture service centers and local government extension offices participated in a training workshop on Participatory Rural Appraisal (PRA). Following the training, extension staff reported feeling more confident in applying participatory tools and techniques in their daily work with farmers. As a result of the project, extension workers are now better equipped to transfer knowledge on rice straw management and are confident in using participatory approaches to engage with farmers. The District Center for Agricultural Development has incorporated the project's rice straw management recommendations into its training programmes and upcoming plans.

At the policy level, the project has increased awareness among local and national government officials regarding the technological, commercial, and environmental potential of improved rice straw management. The Vietnam Ministry of Agriculture and Rural Development (MARD) has recently approved a national project on the “Sustainable Development of One Million Hectares of High-Quality, Low-Emission Rice Associated with Green Growth in the Mekong Delta by 2030,” in which rice straw management is recognized as a key component for emission reduction. Local government authorities expressed strong appreciation for the project’s results and emphasized their intention to integrate the knowledge and practices developed in the new government initiative. Overall, the project has contributed to improving incomes and rural livelihoods in the Mekong Delta.

Quotes from stakeholders (farmers, policymakers, researchers)

“We are adopting a new technique, promoted by the Research and Technology Transfer Centre (NLU) and the District Extension Center, to turn rice straw into fermented silage feed. Through this widespread model, local Extensionists and Farmers' Association are providing us with the necessary training and support. This is a very effective way to manage our feed costs. By utilizing fermented rice straw, we can now secure a practical source of nutrition for our livestock, which is a big help given the sharp rise in commercial feed prices.” - Local farmer in Thanh Tri Village, Go Cong Tay District, Tien Giang Province

Media and communications

<https://www.youtube.com/watch?v=mb1q7whlu8s&list=PLxMYyEvQKo-pYHkjuv7zKx1k9Rz9Wcj5s&index=1>

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<https://www.lrrd.org/lrrd36/6/3682phuo.html>





Project name

Promotion of sorghum-cowpea rotations in smallholder farming systems in South Africa for climate change adaptation

Location and Duration

Location: South Africa (Manzawayo village in Nongoma municipality, Zululand district, Kwazulu Natal Province; and Clau clau village in Mbombela municipality, Enhlanzeni district, Mpumalanga province)

Duration: 2022-2023 (1.5 years)

Challenge

In South Africa, changing rainfall patterns and rising temperatures are projected to alter the suitability of current production zones for key food security crops posing a serious threat to smallholder livelihoods. This growing climatic uncertainty underscores the urgent need to provide smallholder farmers with evidence-based guidance on the performance of various crops and agronomic systems across diverse agroecological zones. Such knowledge is critical to support adaptive decision-making, sustain productivity, and reduce vulnerability to climate-induced shocks. Among the crops with significant potential to enhance resilience are sorghum and cowpea, two traditional, yet neglected and underutilized crops in Africa. These crops are known for their hardiness, nutritional value, and adaptability to marginal environments.

Sorghum-cowpea rotation systems can substantially improve productivity and resource efficiency, enhance grain yield for both crops while increasing water-use efficiency. However, these crop rotations remain uncommon among smallholder farmers in South Africa due to low awareness, limited access to improved seed varieties, insufficient research-extension linkages, and weak policy incentives.

Intervention/Approach

The sorghum-cowpea project adopted a multi-stakeholder and inclusive value chain approach to address the multi-faceted challenges that often hinder technology adoption. The project convened stakeholder meetings with farmers, community leaders, researchers, and extension officials to identify key problems, understand stakeholders' aspirations, and map additional actors critical for achieving project goals. These meetings were used for facilitating participatory planning, capacity building, and gathering feedback on ongoing activities. Farmer days and cooking demonstrations were planned to provide opportunities for farmers to showcase sorghum production from experimental plots, innovative dishes, share experiences, and exchange lessons learned with community members and stakeholders. These events also served as practical forums for sharing agronomic advice, field management techniques, harvesting practices, and market opportunities, supported by extension officers and input suppliers.

To extend knowledge beyond the project sites, an information exchange event was organized to bring together extension officers from four additional municipalities within the Zululand district, KwaZulu-Natal.

Impact (on policy and practice)

Through the project, there was a notable increase in farmer's enthusiasm, knowledge, and skills related to sorghum-cowpea production, enabling them to upscale and diversify their cropping systems. Two groups, namely the Fuduka Cooperative and Clau Clau Farmers Group, expanded sorghum production to 1 hectare and 0.75 hectares respectively, with several members also integrating cowpea into their individual plots. This enthusiasm extended beyond project participants, inspiring neighboring farmers to adopt similar practices.

The project further enhanced coordination and collaboration among stakeholders, particularly extension officers, who gained increased knowledge, skills, and motivation to support sorghum and cowpea production. Although the department of agriculture officers always have been available to offer farmer support, through the AgriFoSe2030 project there was renewed interaction, especially for the farmers that were involved in the project. They became more engaged in providing hands-on technical support and facilitating linkages among farmers, researchers, and government authorities. Extension officers also recognized the value of multi-stakeholder involvement in driving agricultural development, helping to organize stakeholder meetings and connect farmers with key resources.

The extension officers also had increased knowledge and skills in sorghum and cowpea production, as well as motivation to assist the farmers in the production of these crops. They became more engaged with the Clau Clau farmers and Fuduka cooperative

farmers, offering more hands-on technical backup and support. The extension officers also became more aware of the importance of multiple stakeholder involvement to drive agricultural development forward and were therefore, key in inviting identified stakeholders and organizations of the stakeholder meetings, for example the Nongoma Municipality local economic development department invitation. In Clau Clau village, Mpumalanga, the extension officers served as the main communication channel between farmers, researchers and other stakeholders.

The establishment of innovation platforms and cooperative networks created spaces for dialogue and co-creation of solutions. These platforms amplified farmers' voices, fostering a sense of ownership and encouraging proactive engagement rather than passive reliance on external interventions. The project also strengthened market linkages, enabling the Fuduka Cooperative to sell approximately 130 kilograms of sorghum at competitive prices and reinvest the proceeds into fencing cooperative fields to secure it from livestock. The cooperative is now known to stakeholders as producers of quality sorghum.

The Clau Clau Farmers Group similarly gained recognition as sorghum producers through millet sales in the Department of Agriculture and participation in events such as the "Year of the Millets" celebration.

Support from multiple stakeholders, including local government and private sector actors, provided tangible resources such as tillage services, seeds, and business training, further enabling farmers to improve production and small enterprise development. Besides receiving government input support through the Department of Agriculture office, Nongoma municipality provided a tractor for tillage, and private sector actors (Lake agriculture) donated vegetable and maize seed to farmers in Manzawayo village.

Overall, the project enhanced farmers' technical skills, fostered collaboration among diverse stakeholders, and strengthened market and resource access. This contributed to increasing smallholder resilience, soil fertility, water efficiency, food and nutrition security, income generation, and sustainability in the face of climate change. Farmers now possess the knowledge, motivation, and platforms to continue improving sorghum and cowpea production, contributing to broader food security and agricultural development goals.

Quotes from stakeholders (farmers, policymakers, researchers)

"AgriFoSe2030 has empowered us to have a voice and work together as farmers to seek solutions to our problems." - Clau Clau farmer

"Thanks to AgriFose2030 project, we now have a reliable market for our sorghum and hope to grow our cooperative to a business." - Fuduka cooperative member, Nongoma

"As Nongoma Municipality local economic development, we are happy to be part of the stakeholders supporting farmer development in Manzawayo village, especially Fuduka cooperative whose existence we were not aware of. Going forward, we will help train

them and support them obtain compliance so that they are able to access (financial) support from various institutions.” Nongoma Municipality

Media and communications

<https://www.youtube.com/watch?v=lvdoF7MUIqg'>

<https://www.slu.se/en/collaboration/international-collaboration/slu-global/agrifose2030/change-stories/sorghum/>

<https://www.slu.se/en/news/2024/01/agrifose2030s-sorghum-project-contributes-to-climate-smart-agriculture/>



Nongoma farmers' cooperative sorghum



Visit to female farmer's farm



Farmer expressing his opinion during



Cooking competition prize winners

Project

Participatory analysis of the conventional-agroecological intensification continuum for increased productivity and sustainability in the coffee-banana systems

Location and Duration

Location: Mt Elgon region of Uganda - Sironko and Kapchorwa districts

Duration: 2022 – 2024 (2 years)

Challenge

Uganda's agriculture sector faces persistent challenges that limit productivity, resilience, and sustainability. Crop production continues to be constrained by poor agronomic practices, limited access to markets and credit, inadequate extension services, and the growing impacts of climate change. These challenges are amplified by rapid population growth, which drives land shortages and eliminates opportunities for fallowing, thereby intensifying pressure on already fragile farming systems.

To address this, Uganda's farmers face a dilemma of either intensifying production using conventional, input-heavy approaches which many cannot afford and which pose environmental risks, or to adopt agroecological intensification, which is often constrained by limited bio-input availability, and insufficient technical support. This challenge is particularly pronounced in the Mt. Elgon Region (MER), one of the most densely populated areas in Uganda. Despite its high potential, especially through the Arabica coffee–banana intercropping system, the region's yield is consistently low, putting households at risk of food insecurity, low income, and reduced resilience.

The coffee–banana system provides multiple agronomic and ecological benefits from food security and income diversification to biological pest control and pollination, but current yields fall far below potential with research showing that many farmers operate at 25–50% of their potential efficiency. Research shows that both conventional and agroecological farmers apply inputs at levels far below recommended thresholds, while climate change is increasingly shifting viable production zones to higher elevations. Other challenges of the coffee-banana systems relate to coffee variety, labor input, and shading intensity which are key determinants of yields.

Farmers urgently need pathways that make more efficient use of existing resources such as tree shading and moisture-conserving techniques while responding to climate pressures to increase productivity of coffee-banana systems.

Intervention/Approach

The project implemented a series of interconnected interventions aimed at strengthening collaboration, building local capacity, and improving practices within the coffee–banana farming systems of Kapchorwa and Sironko districts. A multi-stakeholder workshop was conducted to bring together 56 actors across the coffee–banana value chain to build a shared understanding of system challenges and opportunities. These included farmers,

extension workers, civil society representatives, local government officials, financial institutions, traders, media, researchers, and policymakers.

The project included capacity-building through Training of Trainers, equipping extension agents, model farmers, input and marketing agents, local government actors, representatives of the Uganda Coffee Development Authority and financial institutions with knowledge and skills in sustainable intensification. The training benefited 46 participants in Sironko and 40 in Kapchorwa.

To strengthen equity and inclusion, the project provided gender-responsive training to 100 participants. Model farmers were also trained to lead field demonstrations of productive coffee-banana system in eight sub-counties of the two districts reaching 463 participants. Local committees were formed in both Kapchorwa and Sironko to act as community consultation hubs, each comprising ten key members representing extension agents, model farmers, and influential community actors. Engagement activities further extended to eight schools in the two districts, reaching 1,756 school children and staff. The project concluded with a final stakeholders' workshop bringing together actors across the value chain, complemented by media engagements to amplify learning, share experiences, and promote wider uptake of successful practices.

Impact (on policy and practice)

Coffee-banana farmers in the Sironko and Kapchorwa districts are now better linked to key extension staff and other agricultural service providers and have an increased motivation for positive change. These knowledge networks - particularly community - based trainers, model farmers with demonstration fields, and local committees that serve as consultation hubs - continue to act as important points for receiving tailored information, education, and communication materials. This has enabled farmers to be better informed and to learn more about improved agricultural practices, value chains and market opportunities.

Additionally, coffee-banana farmers in Sironko and Kapchorwa districts now have the knowledge and skills needed to intensify production in a sustainable manner. As a result, they are better positioned to improve coffee-banana productivity, leading to higher incomes, improved food security, greater resilience to climate variability, and enhanced environmental health.

Agricultural service providers, value chain actors, and traders who had previous experience now have a deeper understanding of farmers' needs and are better equipped to support them achieve higher yields within their coffee-banana agroecological systems. Similarly, young people - who constitute the next generation of farmers - are increasingly aware of and advocating for sustainable agriculture and environmental stewardship.

Farmers that participated in the trainings have become good examples in their communities, some have even been cited for reference by local leadership. Some women who participated in the gender training have taken on roles that were not traditionally 'women roles', i.e. to participate more in decision making and obtained further education..

Traders and personnel from financial and credit organizations are also now aware of farmers' challenges and are willing to share key information on market and credit challenges and opportunities. This ensures that farmers are linked to market and value chain actors so they receive inputs where needed and can sustainably sell their products at the best price.

Quotes from stakeholders (farmers, policymakers, researchers)

“Is there another chance for training, please we are very ready; one day we had a meeting at the sub county, and the leadership was referring to the community to come and learn from my garden.” - Farmer, Sironko district

“I have a small portion (land) but see a big change in that, the bunch is big and yield is promising; and I have completed my studies”. - Female Farmer

“Farmers that benefitted from the training have high coffee and banana yields from good practices and skills in agroforestry, pruning, stumping, water conservation and soil management. Some of the women that participated in training are now performing activities thought to be for men alone such as spraying, marketing farm products, stumping and are participating more in decisions in their homes”. - Local Government Officer, Kapchorwa district

Media and communications

<https://www.youtube.com/watch?v=B5gLVnNmhHU&t=10s>

<https://www.slu.se/en/news/2023/10/summary-of-the-coffee-banana-project/>



Coffee-banana model farms



Women participation in coffee-banana intensification



Training session with farmers

Project

Science-based and co-produced transformative Rangeland Management Practices – how to deal with encroachment of unwanted woody species (TRAMAP Kenya)

Location and Duration

Location: Samburu, Kenya

Duration: 2021 – 2024 (3 years)

Challenge

Samburu County faces a multifaceted challenge rooted in its arid environment, highly variable climate, and heavy dependence on pastoralism and agropastoralism. With only a small fraction of land being arable and most households reliant on livestock, erratic rainfall, rising temperatures, and recurrent droughts have intensified pressure on already fragile rangelands. Land degradation is accelerating, driven by soil erosion, declining grass cover, biodiversity loss, and increasing deforestation.

One of the most severe threats to the Samburu rangelands is the rapid spread of invasive and noxious plant species, including *Acacia reficiens*, *Cissus rotundifolia*, *Opuntia stricta*, and *Prosopis juliflora*. These species outcompete native fodder plants, reduce forage quality and availability, hinder grazing, poison livestock, raise production costs, and diminish land value. This challenge leaves pastoralist and agro-pastoralist

households who depend directly on healthy rangeland ecosystems particularly vulnerable.

Compounding these ecological threats are persistent livestock disease outbreaks, inadequate grazing resources, insecurity, and limited awareness of rangeland management solutions. Climate-related hazards, including droughts, occasional flooding, pasture and water scarcity, salinization, and pest and disease outbreaks, further undermine household food security. Because livelihoods rely heavily on livestock for food and income, climate shocks translate directly into reduced wellbeing, constrained access to essential goods, and heightened vulnerability. As an adaptation the Kenyan government has introduced camels as a more adaptive livestock species to the changing climatic conditions, however, extension and veterinary staff at the county have weak knowledge and capacity to support camel production leading to reduced productivity.

These converging challenges highlight an urgent need for capacity building, early detection and removal of invasive species, and adoption of transformative rangeland management practices. Restoring degraded land would help enhance ecosystem services, increase livestock productivity, and strengthen the resilience of pastoralist and agro-pastoralist livelihoods.

Intervention/Approach

The objective of the TRAMAP project was to support pastoralists and agropastoralists to increase agricultural productivity and enhance landscape ecosystem functions through collective adoption of sustainable rangeland management practices. These include adopting hardy livestock species, producing supplemental feed, and improving animal health, while also fostering co-production of knowledge between scientists and communities to develop effective rangeland restoration and management strategies. The project interventions in Samburu county included a scoping review to establish the baseline and verify the state of the challenge. An inception meeting was organized to introduce the project, identify sites, and engage key local actors including the Samburu East community, local administration, Kalama Conservancy, and Girgir Group Ranch.

Community capacity building began in mid-2022 with training on rangeland restoration techniques and control of *Acacia reficiens*, followed by camel husbandry, health, and welfare training to 22 local trainers of trainers (ToTs), county veterinary staff and a Samburu east livestock officer. This included strategically identifying and working with influential community resource persons who can enhance local training activities. The project further undertook two co-production write-shops that brought together ToTs, veterinary experts, private sector extension actors (ASAL eXtension Ltd) and county livestock officers to develop a camel husbandry and disease prevention manual, later expanded to include fodder production guidance. Knowledge exchange expanded further through a peer-to-peer learning visit to Baringo where 40 Samburu ToTs enhanced their skills in cultivating drought-tolerant fodder. Additional capacity building was conducted on fodder production for 30 ToTs in Wamba and the Jerusalem communities which are suburbs of Samburu County. The project concluded its dissemination phase in May 2024 with a policy and practice engagement forum with stakeholders from the Samburu County Government, NGOs, NDMA, and partner organizations.

Impact (on policy and practice)

The project strengthened local capacity and improved livelihoods in Samburu County by building practical skills, co-producing locally relevant knowledge, and enhancing climate resilience. Twenty-two community-based trainers and disease inspectors and reporters received hands-on instruction that increased their competence in identifying, managing, and reporting camel diseases, husbandry, and welfare. The adoption of an experiential co-learning approach with practical demonstration sessions helped Samburu livestock keepers adopt better husbandry practices and improved their ability to work collaboratively with veterinary professionals.

A major outcome was the co-production of a camel production and welfare handbook specifically tailored for Samburu County which increased access to practical information on camel husbandry and equipped extension staff with knowledge for farmer training sessions. Developed with camel keepers and technical experts, the handbook noted how wider use of qualified veterinary doctors, and follow-up visits from veterinary officers and extension staff can lead to early disease detection, improvements in camel health, and increased milk production. The project further trained forty ToTs in commercial fodder production, and many farmers who received the trainings began producing grass on their own farms, contributing both to ecosystem restoration and to a reduction in conflicts associated with scarce grazing resources. Extension officers also noted how valuable the training and camel handbook had been for them since it fills a critical gap in extension knowledge for camels which is a newly introduced livestock and has different needs compared to cattle and goats. The co-produced camel welfare and production handbook has already influenced extension officers to adjust training plans and resource allocation.

The commitment of community trainers and disease inspectors and reporters further strengthened the impact by creating sustainable sources of knowledge dissemination within the county. These participants expressed willingness to engage in exchange visits where they share the knowledge received through the project. The project further created better linkages between farmers, extension staff, veterinary staff and local authorities. Many participants felt empowered and showed readiness to voice their challenges to extension officers including areas where they desired more advanced training. This strengthened the county's early warning system and supported One Health objectives.

The project also broadened understanding of ecologically appropriate and locally available camel forages while deepening practical skills in rangeland restoration. Community members improved their ability to manage invasive species particularly through strategic cutting techniques. They also increased their knowledge on applying soil and water conservation practices alongside reseeding degraded areas with rangeland grasses and forage legumes. The project's outcomes show that farmers can successfully adopt commercial fodder production and reseeding practices when provided with the right guidance and locally appropriate species. These practices reduce pressure on communal grazing lands and contribute to ecosystem restoration.

Beyond technical outcomes, the project fostered a shift in how knowledge is produced and shared. Pastoral communities and development partners welcomed the collaborative approach, valuing the opportunity to co-generate knowledge with

scientists, agricultural workers, and other stakeholders. The Samburu County Government played a crucial role in co-learning activities and peer-to-peer field exercises, helping to legitimize and anchor the project within county government structures. The collaboration with Seiya CBO in Baringo increased knowledge on drought-tolerant fodder production which enabled Samburu farmers to learn from successful models within similar dryland contexts. Broader partnerships with the Kenya Camel Association, ASAL eXtension, and Samburu County's State Department of Livestock Production created a comprehensive support system that addressed both technical and institutional needs of farmer and other stakeholders. Together, this stakeholder collaboration increased confidence in evidence-based practices and laid the foundation for continued collective action in sustaining Samburu's rangeland ecosystems. Policies should formalize these coordination mechanisms and promote joint planning, data sharing, and integrated service delivery.

Quotes from stakeholders (farmers, policymakers, researchers)

“Through the TRAMAP project, I have strengthened my expertise in fodder production, identifying suitable species for diverse ecosystems and soil types, and distinguishing forage options for both livestock and wildlife. I have also learned the scientific names of key woody and herbaceous species, while deepening my understanding of the distinction between native invader species (e.g., *Acacia reficiens*) and alien invasive species (e.g., *Prosopis juliflora*), which pose significant challenges in my area of jurisdiction.” - Livestock Officer for Samburu East Sub-County

“I embraced superior camel breeds, learned husbandry skills and now use nutritious camel milk both for income and as a vital substitute for scarce vegetables in semi-arid Wamba.” - Female camel farmer in Samburu East

“Thanks to the TRAMAP camel husbandry training, I can now diagnose diseases correctly, seek veterinary support, and I have boosted my milk yields” - Female camel farmer in Samburu East

Media and communications

<https://www.slu.se/en/news/2024/04/agrifose-the-native-land-grabber/>

<https://www.slu.se/en/news/2024/04/agrifose2030-project-boosts-livestock-management-and-environmental-conservation/>

https://larmat.uonbi.ac.ke/sites/larmat.uonbi.ac.ke/files/2024-09/CAMEL_HUSBANDRY%20HEALTH%20AND%20WELFARE%20HANDBOOK_FINAL_FOR%20PRESS.pdf

https://www.slu.se/globalassets/slu.se/samverkan/slu-global/agrifose2030/pdf/agrifose2030_pb_tramap_final.pdf



Camel health training



Identifying camel feed



Exchange visit on fodder production



Co-production of the camel manual

Challenge 3: Science-based innovation and extension

Project

Training and Empowering Village-based Agricultural Agents to be more Gender Sensitive (GenSens)

Location and Duration

Location: Ilonga Agricultural College and Lushoto District, Tanzania

Duration: 2023-2024 (11 months)

Challenge

Agricultural extension systems across SSA face multiple challenges that hinder the effective flow of knowledge to diverse smallholder farmer groups. These challenges often arise from the way extension services are structured, the low extension officer-to-farmer ratio, and social norms that privilege certain groups while marginalizing others. Female farmers are disproportionately under-served by agricultural extension despite constituting a significant share of agricultural labour. In addition, structural inequalities, such as restricted access to land, capital and decision-making power, further limit women's ability to adopt new technologies and implement improved farming practices. Many agricultural extension officers struggle to take account of, and adapt to, gendered differences in knowledge, skills, confidence and power. This project aimed to work to improve the effectiveness of agricultural extension services in supporting female smallholder farmers in Tanzania. The project's strategy was informed by an initial systematic literature review which highlighted how most female smallholder farmers in developing countries have limited access to extension services and even when they do gain access, they are often less able than men to implement the advice given due to their different positionality.

Intervention/Approach

The project worked with one of the Government of Tanzania's agricultural extension training colleges in Ilonga town, also known as MATIs (Ministry of Agriculture Training Institute) and with Lushoto District Council staff and Lushoto female vegetable farmer groups. Initial needs assessments in relation to gender and agriculture were conducted with agricultural extension tutors, with students training to be extension workers, and with female smallholder farmers. These were followed by two separate training workshops designed to strengthen the understanding of gendered differences in needs, the role of gender within agriculture, and to enhance the capacity of stakeholders to be more sensitive to gender.

Impact (on policy and practice)

The project activities directly reached 101 participants and contributed to deep and transformative understanding of how gender gaps can arise, what contributes to gendered differences in skills, abilities and decision-making power, and strategies for reducing gaps. Participating women reported increased confidence and visibility, and their stories helped tutors and extensionists better grasp the barriers women face in

accessing extension services. Participating men recognized their role in exaggerating gender gaps and pledged to work towards fairness and equity for their daughters and wives. Though this mindset shift occurred among a small group of men in the Lushoto District, its depth and sincerity holds promise for continued community-level advocacy and long-term change.

At MATI Ilonga, the project uncovered that although a gender-sensitive curriculum existed on paper, it was rarely reflected in classroom practice or field activities. The common approach to considering gender had been limited to ensuring equal numbers of men and women. Through carefully designed workshops and capacity-building sessions, tutors and extension officers were exposed to the realities of gender inequalities in farming systems and guided on how to translate gender concepts into actionable teaching and extension strategies. As a result, gender responsiveness within Ilonga college's agricultural extension training programme was strengthened, shifting from a simplistic focus on numerical equality toward a more qualitative improvement.

A Gender Gap Visualization exercise was developed to help tutors and extension workers identify and understand how gender disparities can arise and how they are of crucial relevance in working to improve farming productivity and sustainability. The visualization exercises opened the tutors' eyes to the lived experiences of women in agriculture and led to a profound change from abstract understanding to empathetic awareness of gender gaps– they served to bridge the theory-practice divide that had become increasingly apparent during the research. Tutors expressed a renewed commitment to integrating gender considerations into all aspects of their teaching, ensuring that future extension officers are better equipped to serve both male and female farmers equitably, though they acknowledged they needed more training – something the follow-up project in the AgriFoSe2030 extension period will deliver on.

Engagement with district-level decision-makers and the Ministry of Agriculture's Director of Training and Research resulted in recognition of the project's value. Ministry representatives expressed strong interest in scaling up the training model nationally, seeing it as the missing link in operationalizing gender equity within agricultural extension systems. This support has allowed us to enter a new extension of the project during which we will provide an obligatory three-day gender sensitivity within agricultural extension training course for all MATI tutors nationwide through a series of regional workshops to be held during 2026.

Quotes from stakeholders (farmers, policymakers, researchers)

“This is what I've been looking for!” - Ministry of Agriculture representative, Government of Tanzania

“I will use real-life case scenarios as a powerful tool to raise awareness about the gender gap, helping people visualize how each of us contributes to the gap. This will foster empathy and encourage shared responsibility in addressing gender inequality within the community.” - Tutor

“From the gender analysis tools shared during the training, I have realized that women bear a significant workload. Therefore, the innovations we aim for should focus on reducing this burden on women.” - Tutor

“My husband and I will work together to eliminate gender norms that oppress women and encourage our community to change these norms for inclusive development.” - Female farmer and group leader

“As a man, this training has opened my eyes. I pledge that, from today, I will ensure responsibilities are equally shared among my sons and daughters at home.” - Male farmer

“I have realized that we men have contributed to poverty in our community by perpetuating gender discrimination. I want to help eradicate household poverty in my community by saying no to gender discrimination. It starts with my own household.” - Male Extension Officer

Media and communications

<https://www.slu.se/en/collaboration/international-collaboration/slu-global/agrifose2030/change-stories/change-story-gensens/>



Workshop participants in Tanzania



Meeting at the Ministry of Agriculture

Project

Agricultural biologicals in sub-Saharan Africa

Location and Duration

Location: Ethiopia, Kenya and South Africa

Duration: 2021- 2023 (2 years)

Challenge

Agricultural biologicals, natural products used for managing crop pests, pathogens, and enhancing plant growth and yields, are increasingly recognized as sustainable alternatives to synthetic agrochemicals that have devastating effects on the environment. Their adoption is accelerating in developed countries, driven by the need for safer and more environmentally friendly plant protection methods. However, in SSA, the status, accessibility, and utilization of agricultural biologicals remain poorly understood. Knowledge gaps exist not only among farmers but also among key stakeholders such as importers, manufacturers, distributors, agrodealers, policymakers, and extension agents. The lack of coordinated information flow, supportive policies, and capacity building further limits awareness, advocacy, and uptake. Addressing this challenge requires a comprehensive understanding of the Knowledge, Attitudes, and Practices (KAP) surrounding agricultural biologicals among stakeholders across the agricultural value chain. This project therefore sought to generate new evidence on the current state and future potential of agricultural biologicals in Ethiopia, Kenya, and South Africa, countries selected for their contrasting levels of adoption.

Intervention/Approach

This project sought to obtain an enhanced understanding of the status of agricultural biologicals, through a KAP analysis of the stakeholders active in the agriculture sector in SSA. This included identification of potential barriers in the introduction, implementation and sustainable use of agricultural biologicals.

It also captured the information flow regarding agricultural biologicals and identified which actors are current and future advocates of agricultural biologicals in SSA, as well as which stakeholders have the potential to be influential advocates of agricultural biologicals in future. Key activities included surveys and interviews with stakeholders representing government, businesses (agrodealers manufacturing, importing or selling agricultural biologicals), farmer organizations and smallholder farmers; assessment of current legislations on agricultural biologicals in the three case study countries; workshops and educational campaigns on scaling up the use of agricultural biologicals and detailed mapping of agricultural biologicals supply chain from sourcing to market to the end-users. The project shared results at the SASUF (South Africa - Sweden University Forum) Research and Innovation Week in March 2023.

Impact (on policy and practice)

The project advanced understanding and awareness of agricultural biologicals across Ethiopia, Kenya, and South Africa - countries at diverse stages of adoption and regulatory readiness. Through extensive stakeholder engagement and surveys, the project revealed

critical policy, knowledge, and capacity gaps, while simultaneously catalyzing dialogue for reforming regulatory frameworks to accommodate agricultural biologicals.

In Ethiopia, there is a “Pesticide registration and control proclamation No 647/2010”, which is used to regulate the registration, production, importation, distribution, and control of conventional agrochemicals however no specific regulations are included for regulating agricultural biologicals. The project raised awareness among policymakers on this policy gap and this advocacy reactivated earlier government discussions toward developing a directive to guide the registration, production, distribution, and importation of biological products. Through training workshops, interviews and surveys most farmers recognized the potential negative impact of chemicals on human health and the environment; however, only few recognized agricultural biologicals as a safer alternative, underscoring the need for further education and extension support. According to the latest information from the Ethiopian Agricultural Authority, the fast-track registration process for bio-pesticides and bio-fertilizers has been approved. In addition, separate directives for bio-fertilizers and bio-pesticides have been developed and reviewed by a team of national experts. One of these directives is currently awaiting parliamentary approval. While not entirely attributable to the AgriFoSe2030 project, its interventions contributed to stimulating and supporting the ongoing policy processes.

In Kenya, the project uncovered the non-existence of a policy on agricultural biologicals and a substantial knowledge gap among policymakers and farmers on agricultural biologicals. Interviews, surveys and evaluations of existing legislations prompted greater recognition of the need for policy reform and flexibility to support the safe use and upscaling of agricultural biologicals. Engagement with key regulatory institutions, the Pest Control Products Board (PCPB) and the Kenya Plant Health Inspectorate Service (KEPHIS), contributed to ongoing policy development, including a draft agricultural biologicals policy, draft PCPB bill aimed at easing importation, registration and use of agricultural biologicals in Kenya, the pest control products (registration) Regulations, 2024 and the review of the Plant Protection Act and its regulations. Farmers showed a willingness to adopt agricultural biologicals while some agrodealers considered adding stocks of non-synthetic inputs in their shops, signaling growing openness towards sustainable plant protection and yield improvement alternatives.

In South Africa, the legislative framework (Act 36 of 1947 and its amendments) already covers agricultural biologicals but it equates them with chemical inputs. This means agricultural biologicals are required to meet the same efficacy requirements as chemical inputs, which may be difficult thereby making product registration difficult. Through stakeholder engagements, the project highlighted the need to decouple the current efficacy level requirements such that different standards and thresholds are applied to agricultural biologicals and chemical inputs. The project also strengthened institutional collaboration, notably between the Agricultural Research Council (ARC) and the Department of Agriculture, Land Reform and Rural Development (DALRRD), which requested technical support on upscaling agricultural biologicals.

The project revealed a significant communication gap in the dissemination of knowledge on agricultural biologicals, which remains largely confined to scientific publications. A

quarter of surveyed researchers had never produced popular science articles, and two-thirds had never written policy briefs. This inspired project members to advocate for greater integration of outreach and communication strategies within their institutions including translation of research on agricultural biologicals into accessible formats for stakeholders.

The project has created a foundation for regional collaboration, evidence-based policy dialogue, and greater awareness among researchers, regulators, and farmers. It initiated the establishment of an African agricultural Biologicals Network in collaboration with already existing networks and organizations in the SSA region, and as a continued initiative with CABI Nairobi. This network provides a platform for approaching improving uptake, engaging key stakeholders and sharing knowledge on agricultural biologicals. This initiative has been further funded by the Swedish International Agriculture Network initiative (SIANI) as [one of its expert groups](#) bringing together researchers, farmer representatives, private companies dealing in agricultural biologicals in Ethiopia, Kenya and Tanzania to forge transformative pathways for widescale utilization of agricultural biologicals.

The project has generated significant momentum, leading to the establishment and funding of two new initiatives that directly build on its achievements. The initiatives include inSALSA ([funded by EU Biodiversa+](#)) and AgBio4SSA ([funded by Formas, the Kenyan National Research Fund, the Tanzania Commission for Science and Technology, and the National Research Foundation in South Africa](#)). These projects represent a direct continuation and expansion of the AgriFoSe2030 work, focusing on advancing innovation, strengthening research-policy linkages, and promoting the sustainable adoption of agricultural biologicals across SSA.

Quotes from stakeholders (farmers, policymakers, researchers)

“The future of agricultural biologicals in Kenya is bright. There are huge opportunities to integrate them into crop production to enhance food safety” - Agrodealer

Media and communications

- <https://www.youtube.com/watch?v=HZ0Xt7hX-l0>
- <https://www.youtube.com/watch?v=etkLPvI3fU8>
- <https://www.youtube.com/watch?v=J5FiJu4egjc>
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- <https://www.siani.se/news-story/possibilities-and-hurdles-for-biological-plant-protection-in-south-african-agriculture/>
- <https://www.cell.com/action/showPdf?pii=S2405-8440%2824%2902750-6>
- <https://www.siani.se/news-story/paper-explores-attitudes-towards-agrobiologicals-in-ethiopia/>
- https://www.plantlink.se/wp-content/uploads/2020/05/Report_biologicals_workshop_Pretoria_2019.pdf



Stakeholder Workshop on agriculture biologicals in Ethiopia

Project

Functions in extension service pathways – Kenya, Sri Lanka and Laos

Location and Duration

Location: Kenya, Sri Lanka and Laos

Duration: 2022-2024 (1.5 years)

Challenge

A major challenge in most developing countries lies in ensuring that agricultural extension services are adequately equipped as dynamic platforms for knowledge co-creation, dissemination, and scaling of innovation to support economic development. Science-based extension remains difficult to achieve without well-functioning structures and information flows. In many cases, the translation of research into practice follows fragmented pathways, and extension agents often face high demands on their skills and resources. Weak or missing functions in extension systems such as, unequal gender dynamics, and socio-economic barriers often constrain knowledge flows and adoption of innovations. Improving extension functions will require strong policy support and effective coordination among all actors involved in knowledge production and dissemination.

This project was driven by the need to track the implementation of governance structures, draw possible lessons and improve performance of existing extension systems. It seeks to compare the functioning of extension systems in Kenya, Sri Lanka, and Laos, each representing distinct production systems (maize, rice and goat keeping, respectively). Through this comparative approach, the project aims to identify the strengths, weaknesses, and opportunities within existing extension structures and propose strategies for their improvement.

Intervention/Approach

The project's objectives included mapping existing structures of actors actively disseminating knowledge from universities and other research institutions to smallholder farmers in Kenya, Sri Lanka, Laos and Sweden; identifying threats and opportunities within the structures of existing extension services in the partner countries; describing the functions and relationships of the various actors within the extension structures; comparing the effectiveness of existing extension structures within the partner countries; and proposing model extension structures for the individual partner countries which would optimize extension pathways to effectively deliver scientific findings and innovation to smallholder farmers. Each of the participating countries analyzed existing infrastructures, networks and knowledge circulation pathways that enable or hinder specific investments in extension services support to farmers. The project implemented a series of participatory activities aimed at strengthening collaboration, knowledge sharing, and adaptive capacity within agricultural extension systems. These activities included: awareness and consultative meetings, stakeholder interviews and workshops to increase knowledge and awareness of the importance of integrated and responsive Agricultural Knowledge and Information Systems (AKIS).

The awareness raising activities reached 44 policy makers at national and county or provincial levels, 42 researchers from universities and research institutions, 140 extension service providers from public and private sectors, and 752 farmers. A series of consultative meetings were organized to deepen engagement and co-learning among actors. These involved seven policy makers from national and county governments, 38 extension officers from public sector service providers and 31 farmers. Stakeholder interviews were conducted to capture diverse perspectives from 25 policy makers, 13 researchers and academics, 162 extension officers, six input dealers and 765 farmers. Additionally, a series of workshops brought together 158 participants to identify opportunities for strengthening extension systems and learning across countries

Impact (on policy and practice)

The project generated significant policy- and practice-relevant insights that have begun to influence how agricultural extension is understood, planned, and delivered across the participating countries. By documenting systemic strengths and weaknesses, generating new evidence, and facilitating structured dialogue among key actors, the project helped shift extension systems toward more participatory, coordinated, and learning-oriented approaches. Across Kenya, Sri Lanka, and Laos, the project revealed persistent

institutional constraints-such as inadequate funding, limited staff capacity, weak coordination between agencies, and fragile linkages between research, policy, and practice- that continue to undermine extension effectiveness. While Kenya had skilled human resources, a supportive policy framework, and positive relationships among stakeholders, weaknesses such as inadequate funding, staff shortages, poor coordination between national and county governments, and weak linkages between research, policy, and practice severely limited the system's effectiveness. The absence of a strong feedback mechanism, coupled with an underdeveloped monitoring and evaluation framework, further constrained the ability of extension services to adapt and respond to farmer needs.

In Sri Lanka, extension agents are well trained and there exists formal mechanisms for information exchange between research and extension institutions. However, the system remains heavily bureaucratic and top-down, with a high farmer-to-extension-agent ratio of approximately 1:4000. Coordination across agencies is also limited, leading to duplication of effort, inefficiency, and resource wastage. Laos boasts of the existence of a national extension policy. However, the country faces financial and human resources gaps, an aging extension staff, weak farm succession planning and communication barriers caused by limited use of local languages. By documenting these lessons, analyzing them comparatively across countries and facilitating dialogue among key stakeholders, the project contributed to a renewed understanding of agricultural extension and provided a foundation for reforming extension structures into learning-oriented systems capable of scaling innovations that enhance productivity and resilience among smallholder farmers. A notable outcome was the enhanced collaboration and dialogue among multiple stakeholders including policy makers, extension service providers, researchers, and farmers which laid the groundwork for more coordinated and evidence-based planning of extension programmes.

The project also initiated dialogue with key government institutions responsible for extension policy and program planning, helping to challenge rigid top-down structures and promote their gradual transformation into more participatory and learning-oriented systems. The participatory consultations and interviews generated valuable evidence on knowledge flows, institutional bottlenecks, and the socio-political dimensions of extension delivery. This evidence informed discussions on how AKIS could better support smallholder farmers to enhance productivity, resilience, and environmental sustainability.

The engagement process also prompted a re-evaluation of initial assumptions, particularly the notion that extension system reforms are primarily technical. Instead, the project revealed that social, institutional, and relational dimensions, such as trust, communication, and mutual accountability, are equally important in determining effectiveness. This recognition has shifted the stakeholder's understanding toward fostering a culture of co-learning, open communication and constructive feedback among actors at all levels.

Quotes from stakeholders (farmers, policymakers, researchers)

“The project helped us understand the different structures in extension services including their strengths and weaknesses. This has helped us understand the different systems, share lessons and advise local governments and extensions officers better”.
Researcher, Kenya

Media and communications

<https://www.slu.se/en/news/2024/06/agrifose-stakeholder-engagement-drives-agricultural-progress-in-kenya/>

<https://www.slu.se/en/collaboration/international-collaboration/slu-global/agrifose2030/change-stories/planting-seeds-of-change/>



Sharing fact sheet on extension structures with farmers in Embu

Project

Digitalization of extension services in the South-East Asia (SEA) region

Location and Duration

Location: Cambodia, Philippines and Vietnam

Duration: 2021-2023 (1.5 years)

Challenge

Persistent socio-political and economic barriers continue to hinder smallholders' access to timely, relevant, and actionable agricultural information. Many remain unable to manage risks related to climate change, market fluctuations, and technological advancements. Digital Extension Services (DES) offer opportunities to bypass traditional

intermediaries, reduce transaction costs, and enable real-time knowledge exchange. Through mobile technologies, internet platforms, cloud services, and data analytics, DES can revolutionize how farmers access market, weather, and production information. Yet, the implementation of digital extension systems across SEA, particularly in countries like Vietnam, Cambodia, and the Philippines, remains fragmented and largely driven by private actors. Public systems have been slow to adapt, lacking the necessary infrastructure, digital literacy, and institutional support. While novel, digitalization of extension services faces challenges of limited accessibility to digital platforms for smallholder farmers; quality assurance of digital content ensuring that advisory information remains science-based and contextually relevant; governance and coordination gaps between public and private extension actors and weak digital literacy and interpretation capacity, as more information demands higher levels of education and technological familiarity among users.

Intervention/Approach

The project sought to enhance the skills and competencies of the extension services personnel to achieve long-term outcomes for continuous support and effective services in the agriculture sector through DES. This was done through conducting a systematic review of the current status of digital extension development across Cambodia, the Philippines, and Vietnam, and identifying strategic pathways to ensure that digital extension regulations effectively serve the agricultural advisory sector. These efforts were designed to improve the accessibility and timely delivery of DES benefits to smallholder farmers. Additionally, the project placed strong emphasis on strengthening the capabilities of young extension researchers through engaging them in participatory data collection, stakeholder consultations, key informant interviews, and national consultative workshops.

Throughout its implementation, the project carried out a series of integrated activities, including capacity-building workshops, systematic literature reviews, household surveys, and training programmes on translating scientific knowledge into policy and practice. Participatory learning exchanges and regional consultative workshops were also organized to validate research findings, promote cross-country learning, and chart future directions for advancing digitalized agricultural extension systems in the region. Furthermore, the project employed comparative studies to assess the extent and determinants of DES adoption among smallholder farmers, with particular attention to the participation and experiences of women.

Impact (on policy and practice)

In total, the project directly benefited 1,523 participants in Cambodia, Philippines and Vietnam. In the Philippines (Biliran and Leyte provinces), the project successfully enhanced knowledge and awareness of DES among farmers and agricultural stakeholders. Collaborations were strengthened with municipal and provincial agricultural staff, enabling closer coordination for DES promotion and implementation. Smallholder farmers were trained in using mobile applications, increasing their ability to access agricultural information digitally. The groundwork was also laid for continued collaboration on DES between the University of the Philippines, Visayas Tacloban College, the Department of Agriculture and the Agriculture Training Institute.

In Cambodia, the project facilitated one of the first multi-stakeholder engagements on digital extension services in the country, allowing for the exchange of experiences among practitioners, policymakers, and researchers. The partnership between the Royal University of Phnom Penh (RUPP) and CESAIN–Royal University of Agriculture was formalized through a Memorandum of Understanding to provide Master’s scholarships for students conducting research on DES. As a long-term outcome, RUPP secured an opportunity from CGIAR to conduct a user needs assessment for digital advisory services, demonstrating the project’s influence in shaping future research and interventions on DES in Cambodia. Following the project, researchers in Cambodia were contacted by USAID to further build capacity on DES including developing a mobile phone application for DES. However, due to the withdrawal of USAID, the planned activities have been halted. A module on DES was also developed for inclusion in the teaching and training curricula at RUPP.

In Vietnam, the project contributed to improving the capacity, technical knowledge, practical experience and awareness of extension staff, practitioners, and researchers in Quang Tri and Thua Thien Hue provinces. The project also deepened institutional collaboration between Hue University of Agriculture and Forestry (HUAF), local departments of agriculture, extension centers, and private sector partners. Interventions further informed the development of a new postgraduate course on digital agriculture at HUAF, embedding project learnings into the academic curriculum. Between 2022 and 2025 the course has been taught to three cohorts across three semesters, with a cumulative enrollment of approximately 120 graduate students. Furthermore, the visibility of DES research increased as national departments and scientific journals expressed interest in the findings, ensuring broader knowledge dissemination. Overall, the project contributed to increased knowledge generation, stronger institutional partnerships, improved research capacities, and greater awareness of digital extension services across SEA.

Quotes from stakeholders (farmers, policymakers, researchers)

“The AgriFoSe2030 project was implemented at a critical moment, as the demand for digital transformation in agricultural extension had become urgent. Growing expectations from higher-level authorities and the public for accurate, sufficient, and timely information placed considerable pressure on extension officers, who faced limited guidance and training to meet these requirements. The project effectively addressed these challenges and has been highly valuable to the center.” - Employee, Quang Tri Provincial Extension Center

“There are many advantages to DES. Foremost, I can have more time now doing other tasks since I can share these apps with people/farmers online or through the internet. I can just contact them, so I can prioritize those who are in faraway places, instead.” - Farmland owner and extension service provider

“For many years, I relied on traditional farming techniques, but over the past seven years I started using technologies introduced by the agricultural extension office and NGOs. After consulting with extension workers and watching instructional videos, I was able to solve about half of the problems I faced in my fields. One day, by chance, I watched a

YouTube video about a farmer growing garlic leaves, and I realized that garlic was easier to grow than cabbage. That inspired me to try something new. I then began using a local digital extension service application called Angkor Salad. The application operator even provided me with US\$100 to purchase materials and agricultural inputs through the app so that I could learn how to use it effectively. Today, I am successfully growing garlic leaves and produce about one ton per month. I continue to watch YouTube videos and use the Angkor Salad app to support and improve my farming.” - Farmer in Kampong Chhnang province.

Media and communications

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Training Workshop on DES

Challenge 4: Smallholder agriculture within transforming food systems

Project

Unlocking the potential of smallholders for resilient urban food systems (RUFSS, Uganda)

Location and Duration

Location: Mbale City and Kasese Municipality, Uganda

Duration: 2021-2023 (2years)

Challenge

The farming community in Uganda comprises two categories of farmers namely: the majority smallholder farmers (estimated at 80 percent), and the minority large scale farmers/agribusinesses who mainly pursue plantation agriculture in cash crops and livestock. Yet food systems policy, spatial planning, and efforts towards building agricultural resilience tend to focus on the 20% and sideline the majority. Smallholders are also disproportionately impacted by natural disasters (such as floods, droughts and landslides), pandemic restrictions (as we saw during Covid-19) and changing climate-related threats to production, pest and disease management and their farming systems in general. Since smallholders are often located in marginal, degraded or vulnerable landscapes, involving them in adaptation solutions can make a crucial difference in improving urban food security and resilience to risks and disasters. The last decade was the hottest on record and many smallholder farmers are already struggling to deal with the increasing severity, frequency and spatial coverage of climatic challenge. In the urban foodsheds of Kasese and Mbale floods and landslides associated with more extreme rainfall have increased and frequently wash away smallholder lands and produce. At other times of the year crops and livestock may be lost to drought. In a context where insurance is almost non-existent, boosting the resilience of smallholder farmers is of critical importance. As urbanization accelerates, there is an urgent need to strengthen the inclusion and participation of smallholder farmers in building the resilience of urban food systems.

Intervention/Approach

The primary objectives of the project were to assess the key vulnerabilities in urban food systems in two rapidly growing urban areas (Mbale City and Kasese Municipality); build stakeholder consensus on priority areas, policies, and actions that enable smallholder farmers to contribute to more resilient food systems; and to support decision-makers in crafting evidence-based policies and activities that engage smallholder needs and strengthen urban food-system resilience. To achieve these objectives, the project began by engaging key stakeholders across the food sheds of Mbale and Kasese to identify priorities for improving the resilience of urban food systems. These included smallholder farmers, policymakers, civil society organizations, traders, processors, coordinators of government/community development programmes and local media representatives. The project also facilitated the creation of dialogue and learning platforms designed to bridge the gap between technocrats and smallholder farmers, enabling open communication and collective problem-solving. Training sessions were organized to

build capacity in areas such as good agronomic practices, record-keeping, group formation and dynamics, climate risk assessment, access to finance, and agricultural insurance. In addition, the project supported leaders of farmer groups from Kasese and Mbale to participate in the 2022 Harvest Money Agricultural Expo (an annual event that connects farmers, agribusinesses, and other stakeholders to promote modern farming practices and business growth) and share insights with peers. Peer-to-peer learning was promoted through exchange visits, allowing smallholder farmers, technocrats and political leaders from the two urban authorities to visit model farming enterprises in Fort Portal city and Tororo town.

Impact (on policy and practice)

The project has significantly transformed the way local authorities and communities in Mbale City and Kasese Municipality perceive and engage with smallholder farmers, positioning them as key actors in urban food resilience. Through the project's interventions, local authorities in Mbale City and Kasese Municipality now recognize smallholder farmers as critical contributors to the urban food system and have begun integrating food security considerations, and smallholder perspectives, into urban planning and decision-making. This marks a shift from treating agriculture as a predominantly rural issue to recognizing it as an essential component of sustainable urban development.

The project also enabled smallholder farmers to mobilize themselves into groups, enabling peer-to-peer learning, collective marketing, and experience sharing on best practices. In Mbale City and Kasese Municipality, multi-stakeholder food systems platforms were established: the Mbale City Urban Food Systems Platform and the Kasese Urban Food Systems Platform -bringing together farmers, traders, processors, civil society, policymakers, and researchers. These platforms have become critical spaces for networking, planning, and collaborative action toward resilient and sustainable food systems.

The project facilitated the identification and empowerment of local champions who continue to sustain smallholder engagement and advocacy in both cities. It also enabled local government authorities to gather preliminary data and insights on smallholder farmers, including their demographic characteristics, contributions to food value chains, and the challenges they face such as pests, diseases, wildlife damage, counterfeit inputs, drought, and limited financing. As a result, key stakeholders now better understand the vulnerabilities within urban food systems and have initiated dialogues on potential policy and practical solutions to strengthen resilience.

Through the synergies created by the ToC approach, capacities of smallholder farmers to document and share experiences were also enhanced. For instance, RUFs financially and technically supported Mr. Wepukhulu (Chairperson of the Mbale City Food Systems Platform) to publish a training manual titled "[*Climate Smart and Resilient Urban Farming. A Guide for Smallholder Farmers*](#)".

A major behavioral shift has also been observed among farmers who previously practiced subsistence agriculture. Many have now adopted a more business-oriented

approach, identifying profitable agroenterprises suited to their land and local markets. The institutional impacts are also notable: Kasese Municipality has allocated budgetary support to smallholder farmer activities, while Mbale City has created a new position of Horticultural Officer to support smallholder horticultural farmers directly. Additionally, Mbale City allocated land for an agrodemonstration site, which will serve as a hub for training, innovation, and peer learning on urban farming techniques and space-efficient agriculture. Future work will focus more on resilience to droughts and flooding as an expressed key need.

Quotes from stakeholders (farmers, policymakers, researchers)

“The agricultural department of Kasese Municipality has always given extension services, but we were not aware that there were a number of smallholder farmers that were living and contributing a lot to the local economy of Kasese Municipality. RUFs has opened our eyes [...]and with support in trainings on record keeping [...] and of course, with the making of organic pesticides, we shall manage, and we think production will be at its peak... The whole thing is---can we have food in our homes? Can we have an income from food grown on our small spaces? RUFs has clearly demonstrated that this is possible”. - Senior Assistant Town Clerk, Kasese Municipality

“Previously, we were working as individuals. However, when RUFs mobilized us, we now collectively market our produce through bulking and selling at once in large quantities. Through this approach, we are now able to negotiate for good prices for our produce”. - Member of KKK Farmers’ Group in Mobuku Scheme.

“I would like to pass a vote of thanks to RUFs. They opened our eyes and mobilized us to form groups rather than working as individuals. With this mobilization, the future of smallholder farmers is bright because we now consult and advise each other on a number of things including where to get quality seeds and markets for our produce”. - Chairperson, Nabuyonga Horticulture Farmers’ Association, Mbale

Media and communications

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RUFES Training Sessions

Project (CH 1 and 4)

Transformation of pastoral livelihoods through enhanced capacity for adaptation of nutrition and commercialization policies to local contexts: West Pokot-Kenya

Location and Duration

Location: West Pokot-Kenya

Duration: 2021-2024 (3 years)

Challenge

Due to climate and economic challenges, West Pokot County in Kenya faces recurrent food insecurity despite the county's rich biodiversity and the presence of nutrition-rich and climate resilient traditional crops. Development responses to food insecurity have remained reactive and centered on external food aid leading to the development of an unsustainable donor-dependent mindset for managing food crises. This approach not only delays timely nutritional interventions but also diverts significant resources away from long-term resilience building, while neglecting traditional foods such as millet, sorghum, honey, and beef that form the cornerstone of the Pokot community's cultural and nutritional heritage. The County's Integrated Development Plan (CIDP 2018–2022) demonstrates limited prioritization of indigenous crops and animal products that could diversify food systems and strengthen local markets. Without integrating community-driven evidence into policy formulation, food security efforts risk remaining misaligned with local realities. The challenge, therefore, lies in reshaping practices and policy frameworks to value indigenous foods and enhance community participation in nutrition governance.

Intervention/Approach

The project in West Pokot aimed to transform pastoral livelihoods by enhancing capacity for context-adapted nutrition and commercialization policies. To address the challenge of overreliance on food aid and undervaluation of indigenous foods, the intervention focused on promoting the production and consumption of indigenous vegetables, improving stakeholder knowledge, and shifting government attitudes. To achieve this, a series of activities was implemented including; facilitation of exchange visits and training

for farmers and county officials to learn about value addition, marketing, and group dynamics; facilitation of women groups to conduct demonstration trainings on indigenous food preparation; engagement of local media (e.g., local radio Kalya FM) to promote visibility and recognition of local knowledge and practices as well as development and distribution of a manual on indigenous foods. The project also leveraged community leaders, senior citizens and agricultural extension officers viewed as trusted knowledge nodes by local community members in improving engagement.

Impact (on policy and practice)

The project had a substantial impact on both practice and local policy, reshaping how agricultural decisions are made and implemented within the county. It shifted extension approaches from top-down directives to inclusive, community-driven processes that now guide training, planning, and support for indigenous food systems. These changes became evident through a series of coordinated efforts designed to strengthen collaboration and promote locally grounded innovations.

Efforts focused on bringing together a wide range of stakeholders to introduce innovative vegetable production methods and promote the cultivation of indigenous crops. Previous knowledge sharing and advisory services that followed a top-down, technocratic model led by county government directives changed towards fostering open dialogue and collaboration between county officials and local farmers. Through regular consultations and hands-on activities such as food demonstration events, local media engagement, visits to food processing facilities (such as Cabesi honey processing factory and Lelan dairy processing factory in West Pokot), and practical agricultural training, a more inclusive and participatory approach to decision making emerged. This participatory process helped dissolve long-standing hierarchies, replacing them with open dialogues and shared learning. This shift toward dialogue-based knowledge exchange has empowered local communities and contributed to a more resilient and secure food environment.

The project organized practical food demonstration events to teach families new ways to prepare and preserve traditional foods and their nutritional benefits. The local County nutritionist was engaged to explain the nutritional contents of various locally available foods and provided a solar drier equipment to be used by the women group in training more households on how to preserve indigenous vegetables. These sessions, often led by women's groups, also encouraged men and county officials to appreciate the importance of indigenous foods and the role of women in promoting them. Media coverage in the *Seeds of Gold* section of the Daily Nation Newspaper, (5th December 2022) and by Kalya FM inspired more farmers to adopt simple, innovative vegetable production methods, showing how community-led learning can spread widely when people see success in their own context. County government officials also gradually began using the women group food demonstrations to lobby for increased focus on indigenous foods.

After an exchange visit organized by the project to Bungoma County (specifically to Mabanga Agricultural Training Centre and Chemwa Farmer Field School) to share lessons on collective progress and knowledge diffusion through farmer groups and networks, the

County Government of West Pokot agreed to plan and budget for staff and community training on farmer group formation and skills development. They later included *farmer field schools and group formation and learning* as a priority area in its 2022–2027 County Integrated Development Plan. This signals a gradual mindset shift by the County government from a previously donor-dependence approach to committing resources towards building staff capacity on farmer group dynamics is encouraging and useful for sustainability of initiatives. This is a significant recognition of the project’s transformation potential since county governments’ budgets are often fixed and difficult to reallocate to new and unplanned interventions. Consequently, more local-government-led trainings have been organized to establish new networks for share learning among farmers in West-Pokot and neighboring counties including Bungoma and with the local government officials of both counties. For instance, one month after the exchange visit, the County government of West Pokot invited the leader of one farmer group in Bungoma to train about 10 extension officers and 30 farmers in West Pokot for a week on group formation and management.

Overall, there is now greater recognition of the importance of integrating locally available foods in local diets and the cultivation of local vegetable varieties that enhance food security. This reduces reliance on unpredictable external food relief that may not be equally nutritious. Additionally, the promotion of innovative methods of indigenous vegetable cultivation creates opportunities for market access and value addition.

Quotes from stakeholders (farmers, policymakers, researchers)

“Before the exchange visit to Bungoma, I did not know that vegetables could be grown in plastic pipes with limited water. Now, I can feed my family by growing my own vegetables using waste plastic pipes with only 5 litres of water in a week” – A farmer whose practice of simple vegetable growing skills captured media attention and was reported in the Daily Nation newspaper on 5th December 2022.

Media and communications

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Workshop and exchange visit participants

Project

Governance of food systems for improved nutrition and food security in Nakuru and Kisumu Counties, Kenya

Location and Duration

Location: Nakuru and Kisumu Counties, Kenya

Duration: 2021-2023 (2years)

Challenge

As urban areas expand and agricultural land becomes fragmented, the demand for sufficient, safe, and nutritious food in Kenya continues to rise. However, the agricultural sector struggles with low productivity, unsustainable farming practices, land degradation, and the impacts of climate change. Past interventions have focused heavily on increasing agricultural production without adequately addressing the broader inefficiencies and systemic issues that influence food security. This calls for food systems approaches that view food production, processing, distribution, consumption and waste management as interconnected processes influenced by social, economic, environmental, and policy factors. Achieving this shift requires stronger institutional coordination, evidence-based policymaking, and capacity building for both farmers and local government staff.

While Nairobi, an early signatory to the Milan Urban Food Policy Pact (MUFPP), has advanced in urban agriculture governance, Kisumu and Nakuru are at earlier stages of developing food system governance frameworks. The project seeks to support these counties to strengthen and accelerate their urban food system governance. Strengthening value chains, especially for traditional leafy vegetables such as African

nightshade, spider plant, and amaranth, offers a practical entry point for distilling lessons for urban food system governance.

Intervention/Approach

Drawing lessons from Nairobi's food system governance framework, the 'Governance of food systems for improved nutrition and food security in Nakuru and Kisumu Counties, Kenya' project sought to advance systemic understanding of governance of food systems; contribute to the development of better policies and practices in selected food value chains; identify constraints and enablers of better governance; and generate recommendations for policy and practice. To achieve these goals, the project implemented a series of participatory and capacity-building activities, including county consultative meetings, stakeholder workshops, and awareness sessions with smallholder farmers and traders and peer to peer learning among counties and farmers. In addition, farmers, extensionists and consumers were trained in ways to grow, process, preserve and cook these traditional vegetables to maintain their high nutritional value. A complementary training manual was produced, in partnership with local agricultural extension officers, to support farmer education and value preservation.

A comprehensive food value and supply chain study using a systems approach was carried out to assess governance dynamics, while peer-to-peer learning and knowledge exchange initiatives facilitated collaboration among stakeholders. Collectively, these interventions aimed to build the capacity of both government and non-government actors to design and implement inclusive, well-coordinated urban food system governance strategies that improve food and nutrition outcomes in the two counties.

Impact (on policy and practice)

One significant outcome contributed by the project is the change of mindset among food system actors towards developing a more holistic view of the food system rather than focusing on just one node. By advancing such systemic thinking and multi-stakeholder dialogue on food security, the project supported the development of a draft food system strategy in Kisumu County although this achievement was a result of the joint effort of multiple stakeholders.

Through conducting consultative meetings with key stakeholders, workshops, and peer learning activities, traditional leafy vegetable farmers who were initially marginalized in food system governance and decision making have gained a voice and report higher confidence in sharing their views, demanding for better services from county authorities and seeking knowledge and skills development in the production, value addition and marketing of these nutritious vegetables. Awareness-raising efforts resulted in more inclusive governance structures where smallholder farmers are engaged during project designs, decision making, and implementation. In Kisumu, traditional leafy vegetable farmers have formed a group to streamline engagements and information flow between farmers, market actors and county government officials.

Through a combination of trainings, workshops, peer-to-peer learning, and dissemination of scientific research, smallholder farmers improved their knowledge and skills in the production, management, and record-keeping of traditional leafy vegetables.

Small-scale traders enhanced their capacity in food handling to minimize food safety risks and learned value addition techniques to extend shelf life and increase income through higher-value products. County extension workers also benefited through active participation in the development of a comprehensive training manual for traditional leafy vegetables, produced collaboratively with extension workers and the Food and Agriculture Organization of the United Nations (FAO).

Furthermore, the project contributed to scientific knowledge through addressing a controversy on whether traditional cooking methods for traditional leafy vegetables was a good practice. Through indigenous knowledge, households especially in Kisumu often added milk to the vegetables, a practice that was questioned by some food nutritionists. Through the project, a select group of traditional leafy vegetables were subjected to laboratory tests to test their nutritional values for iron, zinc, and calcium under different traditional cooking methods. Contrary to conventional understanding, the tests indicated that traditional cooking methods do not always result in negative effects on mineral content.

Quotes from stakeholders (farmers, policymakers, researchers)

“Our field extension workers can now train farmers easily using this training manual. It does not only provide guidelines on production, but also management, harvesting, record keeping, preparation, cooking and nutritional value. It is a manual that can be used by all the actors in the traditional leafy vegetable value chain. This will greatly improve the productivity of these vegetables which we are trying to promote as a County”
- Chief Officer in charge of the Department of Agriculture, Livestock and Fisheries in Nakuru County.

“I have learned one thing, it is important to link research, extension, farmers, traders and consumers to realize food and nutrition security among households.” - Researcher

“Now we have a document to use for our training sessions. I urge you farmers not to keep the knowledge you have received today for yourselves. Let each one of you train at least four other farmers to spread the knowledge.” - Extension worker

“I now can cook my vegetables using the traditional methods without fear of losing the micronutrients.” - Farmer

“Learning never stops; we were taught in college many years back that cooking the traditional vegetables using the community methods destroys all nutrients. I will change the narrative and tell the communities that our cooking methods are not bad. All we need to be aware of is which vegetables we are dealing with, what is our target nutrient and focus group. Then we can increase the quantities consumed to meet the daily

allowances of minerals” - A county nutrition officer expressed confidence in the cooking method tests and the need to embrace the traditional cooking methods

Media and communications

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Demonstration and tasting of traditional leafy vegetables



Handing over of traditional leafy vegetables manual to Kisumu County government

Project

Mapping knowledge-, practical-, and policy-level challenges to increase the role of smallholder farmers in e-commerce of fruit products in Vietnam

Location and Duration

Location: Hanoi and Son La province, Vietnam

Duration: 2021-2023 (2years)

Challenge

E-commerce is one of the fastest-growing segments of Vietnam's digital economy. The average annual growth rate of Vietnam's business-to-costumer (B2C) e-commerce revenue reached nearly 19%, from USD 5 billion in 2016 to USD 11.8 billion in 2020. Approximately 51 out of 63 provinces or cities in Vietnam have promulgated a provincial master plan for e-commerce while 44 have launched their provincial e-commerce platforms. Despite these remarkable achievements, agriculture is one of few remaining sectors in Vietnam where e-commerce is yet to have a significant impact. By 2019, only one out of five farm households in Vietnam used digital technologies. In addition, 59% of farmers in Hanoi city, Hai Duong, Son La, and Bac Giang province sell their agricultural products in local markets, 40% sell to aggregators and only 1% use e-commerce platforms or social media to sell their products. Most consumers in Vietnam still prefer to buy agricultural products, especially fresh products, from traditional retail markets rather than e-commerce platforms. The COVID-19 pandemic brought attention to the potential of e-commerce in the agricultural sector with the Vietnamese government supporting smallholder fruit tree growers in Bac Giang province to sell more than 8,000 tonnes of local lychee to over 63 provinces and cities nationwide via Postmart and Voso as the two main national e-commerce platforms. While this is laudable, over 38% of smallholder farmers in Vietnam could not sell their products during the pandemic. In general, e-commerce provides opportunities for smallholders to expand their market access, however, uptake is low among farmers and consumers have been slow to embracing online food purchases. The project analyzed the opportunities for e-commerce adoption and utilization in the agricultural sector, enabling conditions and pathways for scaleup.

Intervention/Approach

The project implemented a series of interconnected interventions. These included a comprehensive desktop review and field analysis on the production and consumption of key fruits- pomelo, longan, mango, and plum in peri-urban Hanoi and rural Son La province. Baseline interviews and focus group discussions were held with farmers, traders, and local authorities to identify constraints and opportunities for developing safe fruit cultivation and expanding access to e-commerce markets. Training activities were conducted to enhance local understanding of e-commerce and strengthen technical skills in using digital platforms. The project team also conducted a policy review and discussions with local authorities to evaluate existing national and sub-national policies supporting agricultural e-commerce. A national workshop was planned to bring together cooperatives, government bodies, research institutions, and e-commerce companies to discuss project findings and policy implications. The findings were shared through outreach activities with local stakeholders, followed by an endline assessment of traders' engagement in e-commerce.

Impact (on policy and practice)

Cooperatives and local authorities in Son La reported improvements in awareness and technical capacity following project workshops and training sessions. The Duong Quang Cooperative began advertising its fruits on Zalo, while Yen Chau mango producers now market their products on Zalo and through the Biggreen company website, a recognized distributor of safe and clean foods in Vietnam. During informal discussions with representatives from the Department of Agriculture and Rural Development, they highlighted that following the project's workshops and trainings on e-commerce in 2022, there had been a notable increase in participation in online fruit sales - approximately 15% among smallholder farmers, 20% among cooperatives, and 10% among traders. This increased engagement also encouraged farmers and cooperatives to adopt safer fruit tree cultivation methods and implement good agricultural practices.

All 11 fruit aggregators who took part in project trainings reported improved knowledge and technical skills in using e-commerce platforms, with two of them establishing online stores on the Post Mart e-commerce platform. Although not entirely attributable to the project's activities, most of the 28 traders in Hanoi and Son La reported an increasing number of online customers in 2022 as compared to 2021. They also observed increases in customers' expectation on fruit quality and safety.

Following the project's dissemination of research findings, provincial agencies in Son La, including the Department of Industry and Trade, and Department of Agriculture and Rural Development, organized workshops and exhibitions to promote agricultural e-commerce, drawing inspiration from project materials used in earlier sub-national and national workshops. One of the farmers' cooperatives (Xuan Tien cooperative) in Son La province who participated in the project's activities, attended one event and opened an exhibition booth to promote their fruit products and shared their experience on participating in e-commerce. This signals that the project's influence extends beyond direct participants and is shaping broader local strategies for agricultural modernization and market access.

Quotes from stakeholders (farmers, policymakers, researchers)

“Thanks to the training on PostMart facilitated by the project, I understand better about this e-commerce platform and hopefully I can get more income by also selling fruit products through this platform. Thank you AgriFose2030”. - Female farmer in Quoc Oai district

“Having seen the benefits of e-commerce, we have included e-commerce as part of the main programmes of Women’s Union, and we also encourage our members who are fruit tree growers to register to e-commerce platforms to reach more customers. Thank you AgriFose2030”. - Representative of Women’s Union in Quoc Oai district):

“Participating in the workshop and training provided by the project has encouraged us to advertise our products using Zalo social media” - Member, Duong Quang farmer’s cooperative in Son La province:

“We really appreciate the contribution of the project in enhancing local knowledge on e-commerce and technical capacities in using e-commerce platforms. Shortly following the workshop and training organized by the project, there has been an increase, maybe around 10-20%, in smallholder farmers cooperatives, and traders’ participation in e-commerce of fruit products”. - Team member, Department of Agriculture and Rural Development (DARD) of Son La province

Media and communications

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<https://www.cifor-icraf.org/project/277d568e270345e0aa080f3c82275cdf/>

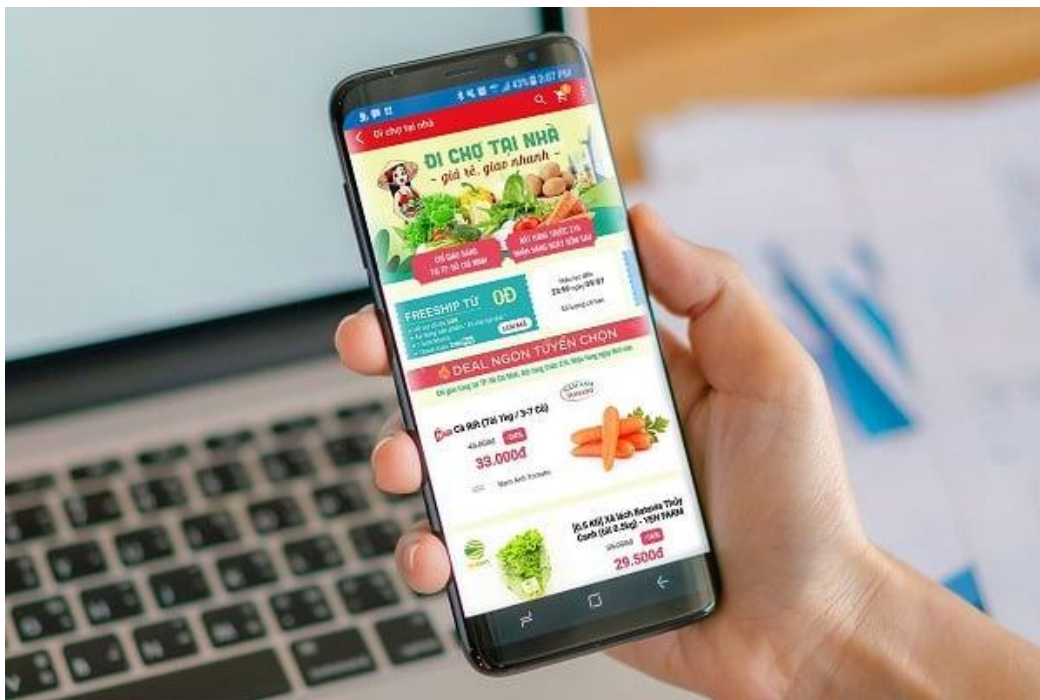
<https://van.nongnghiepmoitruong.vn/e-commerce-as-a-bridge-connecting-farmers-and-consumers-d334848.html#:~:text=Le%20Nhu%20Thinh%2C%20stated%20that,consumption%20trends%20among%20urban%20populations.>

<https://www.youtube.com/watch?v=UjIYAQiuqvY>

<https://www.youtube.com/watch?v=5crakgeZH4o>



E-commerce training workshops



E-commerce app interface

Section 3: How AgriFoSe2030 integrates cross-cutting issues

The AgriFoSe2030 programme integrates Sida's cross cutting issues in multiple ways to ensure alignment with Swedish development cooperation priorities. These include poverty reduction, gender inclusiveness, conflict sensitivity, climate change mitigation and adaptation, and biodiversity protection. Examples of how these issues are addressed within the programme are described in more detail below.

Poverty reduction

Livelihood improvement and poverty reduction were integrated in majority of AgriFoSe2030's change projects. In Burkina Faso's parklands, crop diversification through the introduction of sweet potato production added a new crop to vary the household diet and incomes. In the sorghum-cowpea intercropping project in South Africa, the e-commerce of fruits project in Vietnam and the goat management project in Laos, project participants have been introduced to new markets which has expanded the opportunities for income generation.

Gender and social inclusion

Many AgriFosSe2030 projects are gender sensitive or transformative, working actively towards addressing structural barriers that deepen gender imbalances. Two projects explicitly focused on improving gender outcomes, namely the project on improving gender participation in Uganda's milk value chain, and the project on developing gender sensitive extension services in Tanzania.

Some projects were largely gender sensitive rather than transformative. In the case of rice straw management in Vietnam for example, the different roles of women and men in labor processes were recognized, and project activities were scheduled in ways that took account of women's household responsibilities, such as cooking and childcare. In the coffee-banana systems project in Uganda's Mt. Elgon region, gender was tackled intentionally in different ways, based for example on an awareness that land tenure regulations tend to favor men's ownership. The project's training activities integrated gender sensitivity and social equity principles, actively encouraging women's participation in discussions and making deliberate efforts to include female extension farmers in project implementation. In some cases, gender was not initially prioritized, but after an AgriFoSe2030 gender workshop, project leaders began to integrate gender aspects.

Climate change mitigation and adaptation

Climate change mitigation and adaptation were key considerations integrated into many projects from their inception. In South Africa, the sorghum-cowpea project explicitly sought to address food insecurity that is largely induced by climate variability. To cope with increasing dry spells and drought conditions, the project promoted the cultivation of sorghum and cowpea due to their heat and drought tolerance properties. In Uganda's Mount Elgon region, the coffee-banana project encouraged crop diversification to

strengthen resilience to droughts and floods, improve water management and prevent soil erosion. The project included a training module on resilience, environmental sustainability, and water harvesting. Similarly, the RUFs project worked to enhance the capacity of urban food systems to withstand climate extremes.

In Kenya's Samburu County, the Transformative Rangeland Management Practices project supported pastoralist and agropastoralist communities to boost agricultural yields and improve ecosystem functioning through sustainable rangeland management practices. Local herders, who had been affected by reduced fodder availability due to the spread of the invasive *Acacia reficiens*, collaborated with stakeholders to develop improved livestock management strategies. These included measures for grass reseeded, controlling invasive species, and establishing water harvesting systems. Similar efforts to strengthen climate-resilient and resource-efficient food systems were documented in Vietnam, where the AgriFoSe2030 programme shows that BSF rearing aligns closely with national circular economy and low-carbon development goals by reducing emissions, strengthening local feed autonomy, and improving rural livelihoods.

Biodiversity protection

Although biodiversity was not always an explicit focus, many project activities had outcomes that supported it. For instance, the Agricultural biologicals project in East Africa and the Parklands restoration project in Burkina Faso encouraged the use of organic fertilizers and bio-pesticides as alternatives to chemical inputs, thereby reducing negative impacts on ecosystems and biodiversity. Several projects promoted crop and tree diversification, which, while primarily aimed at improving productivity and resilience, also created conditions favorable for biodiversity enhancement. Efforts to remove invasive species in the TRAMAP project (Samburu county, Kenya) facilitated the restoration of rangelands and the recovery of native vegetation.

Conflict sensitivity

The AgriFoSe2030 programme's methodology with the ToC framework encouraged teams to anticipate risks and potential unintended consequences, including social tensions or conflict. By using this framework across the programme, teams were able to identify where interventions might create or exacerbate tensions and to adjust activities accordingly. Although conflict sensitivity was not originally designated as a cross-cutting issue, the ToC process helped ensure that potential conflicts were considered at multiple levels of programme implementation. Conflict sensitivity was not considered a cross-cutting issue at the beginning of the AgriFoSe2030 programme, but it was still recognised as relevant in many projects. While several projects did not explicitly integrate conflict considerations, two specifically mentioned ongoing or potential conflicts and security concerns in their ToC, along with proposed measures to address these issues. In one instance, conflict was considered indirectly through the recognition that the project's success depended on maintaining a stable security situation in the broader region. Within the TRAMAP project, efforts to reduce soil erosion were reported to have also contributed to easing tensions between farming and pastoralist communities as it allowed for vegetation regeneration.

In Burkina Faso's parkland restoration project, the scarcity and rising cost of mineral fertilizers prompted farmers to turn to locally sourced organic fertilizers, leading to beneficial shifts in agricultural practices. However, changes in local political dynamics simultaneously created less favorable conditions for incorporating agroecological practices into local development planning.

Section 4: Conclusion

The narratives summarized in this compendium of impacts demonstrates that AgriFoSe2030 Phase 2 (2018–2024) has made meaningful contributions to advancing food and nutrition security, sustainable agricultural production, and inclusive rural development across sub-Saharan Africa and South and Southeast Asia. Through a diverse portfolio of change projects, the programme has shown how science-based knowledge, when co-produced with farmers, extension agents, policymakers, and private-sector actors, can be translated into tangible changes in policy, practice, and livelihoods. Across the four challenge areas, AgriFoSe2030 projects consistently strengthened the capacities of local actors to adopt context-specific and science-based innovations. Smallholder farmers improved productivity, food safety, and market engagement; women and youth gained greater agency and access to income-generating opportunities; and extension officers and institutions enhanced their ability to deliver relevant, participatory, and gender-sensitive services. These outcomes were achieved through adaptive approaches grounded in local knowledge, trust-building and collaboration.

A central achievement of the programme has been its role as a catalyst for systems change. Several initiatives contributed to the development of standards, informed sub-national policies, and stimulated follow-on investments by governments. Innovation platforms, farmer groups, and cross-sector networks created under AgriFoSe2030 have continued to function beyond individual project lifespans, pointing to the sustainability of programme outcomes. The narratives also highlight the importance of addressing cross-cutting challenges such as gender inequality, climate change, biodiversity protection, conflict sensitivity, and poverty reduction in an integrated manner. By embedding these dimensions into project design and implementation, AgriFoSe2030 has demonstrated that progress toward SDG 2 is closely tied to broader social, environmental, and economic transformations.

The impacts documented in this compendium establish a strong foundation for the next phase of AgriFoSe2030's engagement in supporting food system transformation in sub-Saharan Africa and South and Southeast Asia. Phase 2 has demonstrated that when scientific knowledge is embedded within local systems and co-developed with those who use it, it can catalyze change. The continuation of AgriFoSe2030 in the phase 2 extension period builds directly on this evidence, shifting from proof of concept toward consolidation, scaling, and deeper institutional anchoring with a [networks of university hubs in Kenya, Uganda and Zimbabwe](#) and a [network of researchers in Southeast Asia](#) (Laos, Vietnam, Cambodia and Philippines).

Moving forward, the programme will prioritize strengthening the long-term capacities of national research institutions, extension systems, and policy actors to independently lead science translation processes. Building on existing networks, platforms, and partnerships, the next phase will focus on embedding co-creation approaches within public institutions, fostering south–south learning, and amplifying voices that are often underrepresented in decision-making, particularly women, youth, and pastoral and smallholder communities. Crucially, the phase 2 period ends with synthesizing lessons for scaling up interventions, understanding not only what works, but why, where, and under what conditions. These were catalogued in [four challenge briefs](#). By synthesizing lessons so far and applying them across contexts, AgriFoSe2030 will support more coherent, adaptive, and impact-oriented approaches to agricultural development and food system governance in its phase 2 extension period. With a tried and tested approach of strengthening the capacity of countries to translate knowledge into action, the programme will continue to contribute to resilient livelihoods, sustainable ecosystems, and equitable access to safe and nutritious food ensuring that progress toward SDG 2 is not only achieved but sustained.