SOWING THE SEEDS

for Sustainable Food Systems in Africa

RESEARCH AND APPLIED KNOWLEDGE

PILLAR I

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eoa ECOLOGICAL ORGANIC AGRICULTURE
Growing Sustainably

Biovision Africa Trust

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Introduction

In 2011, the Executive Council of the African Union (AU) took a decision to build an Africa-wide organic agriculture platform. The African Union Commission (AUC) accepted the mandate, launched the Ecological Organic Agriculture Initiative (EOA-I) and established the Continental Steering Committee (CS) as the apex in the governance structure of EOA in Africa whose members serve to provide EOA in Africa and its membership with guidance, oversight and decision-making regarding the operations and activities of EOA Initiative in Africa. , EOA-I has received alot of support from the Swiss Agency for Development and Corporation (SDC) in the framework of the Global Program on Food Security (GPFS), Swedish Society for Nature Conservation (SIDA) and from Africa Union Commission - DARBE through funds from EU.

The Ecological Organic Agriculture Initiative (EOA-I) was established to transform and create sustainable food systems in Africa by promoting ecologically sound strategies and practices among diverse stakeholders in production, processing, marketing, and policymaking, to safeguard the environment, improve livelihoods, alleviate poverty, and guarantee food security.

The initiative entails a holistic system that aims to sustain the health of ecosystems by relying on functional natural cycles adapted to local conditions, rather than the use of synthetic inputs, which have adverse effects on human, animal, plant, and environmental health. With agroecology as its cornerstone for achieving sustainable agriculture, the initiative placed emphasis on all facets of the food systems from production to processing, marketing and consumption with ecological, economic, and social aspects benefits. EOA-I promots agricultural techniques tailored to local conditions and encouraged practices, technologies and innovations that enhance beneficial biological interactions between various plants and species to build long-term fertility and soil health.

Recognizing the value of conventional, traditional and indigenous knowledge in creating sustainable agricultural systems, the initiative lays a heavy emphasis on community involvement and information sharing. The EOA-I aims to transform and create sustainable food systems by promoting ecologically sound strategies and practices among diverse stakeholders in production, processing, marketing and policy-making, to safeguard the environment, improve livelihoods, alleviate poverty and guarantee food security.

From its inception, the initiative harbors an ambitious goal to mainstream EOA into national agricultural production systems by promoting agricultural practices that maintain the health and fertility of the soil, conserve water resources, and safeguard natural habitats and ecosystems with respect to the interconnectedness between plants, animals and the environment.

To achieve this goal EOA-I is organized around four objectives:

1. To increase documentation of information and knowledge on organic agricultural products along the complete value chain and support relevant actors to translate it into practices and wide application.
2. To systematically inform producers about the EOA approaches and good practices and motivate their uptake through strengthening access to advisory and support services.
3. To increase the share of quality organic products at the local, national, and regional markets; and
4. Strengthen inclusive stakeholder engagement in organic commodities value chain development by developing national, regional, and continental multi-stakeholder platforms to advocate for changes in public policy, plans, and practices.

This booklet highlights some of the outstanding success stories from direct beneficiaries of the project in the nine countries at farmer, processor, and policy-actor levels and as a reflection of the effective implementation of the project action plan through strong partnerships and beneficiaries' needs-oriented interventions.

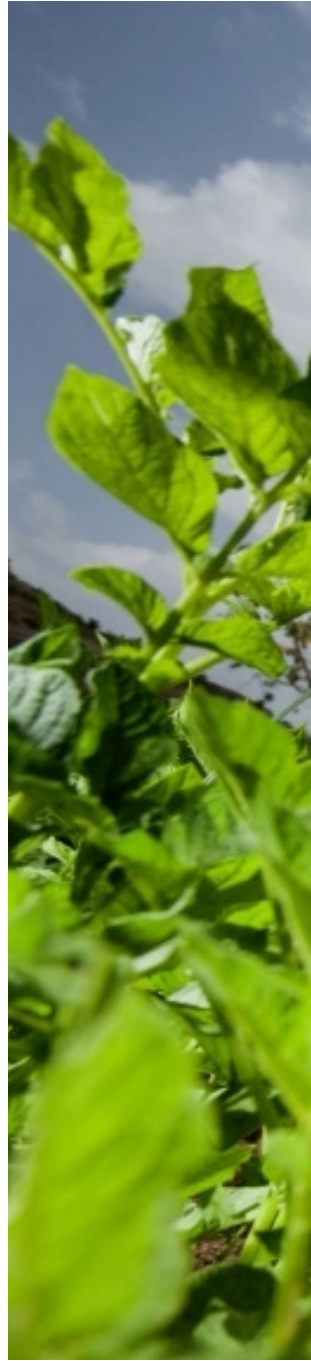
PILLAR 1 - RESEARCH AND APPLIED KNOWLEDGE

Under Pillar 1 of EOA-I, the project through partner conducted a value chain analysis to identify knowledge gaps, needs, and priorities of various actors along selected value chains, with a special focus on women, youth, and marginalized groups. With the results of the value chain analysis, EOA-I partners conducted research in their respective domains to generate information and knowledge to address the gaps, needs, and priorities identified. This yielded extensive evidence-based knowledge for sustainable organic agricultural practices to be disseminated in the project.

Some of the key findings from the Research on EOA have demonstrated that this approach can lead to a wide range of benefits, including:

- **Improved soil health:** Practices, such as the use of cover crops and compost, can improve soil fertility and regeneration.
- **Increased biodiversity:** Intercropping and crop diversification can increase productivity in mixed farming systems for both human and animal health.
- **Enhanced food security:** EOA practices can improve food security by increasing crop yields, diversifying production, and reducing dependence on external inputs.
- **Reduced environmental impact:** EOA practices such use of biocontrol and organic pest control can reduce the environmental impact of agriculture by reducing pesticide and fertilizer use, and conserving natural resources.
- Practices promoted under the EOA showed great potential to improve health by reducing exposure to harmful pesticides and promoting the consumption of healthy and nutritious food.

Overall, EOA represents a promising approach to sustainable agriculture that can help to address a range of environmental, economic, and social challenges.



Ethiopia

I WANT VERMICOMPOSTING TO EXPAND – REACHING MORE FARMERS

Mohammed Ali is a smallholder farmer residing in Gobeya Village, Tehuledere district of South Wollo zone in the Amhara Region, Ethiopia. Prior to joining the EOA-I project, Mohamed and his neighbours experienced low crop yields that were insufficient for their families to subsist on. Mohamed and his peers had been applying the conventional system of farming.

He was recruited by Wollo University researchers as one of the lead farmers to be trained on how to make and effectively apply vermicompost.

> **Vermicomposting** is a type of composting in which certain species of **earthworms** are used to enhance the process of organic waste conversion and produce better soil nutrients.

Mohamed was trained on how to convert a wide range of organic residues, such as straw, husk, leaves, stalks, weeds, and animal waste into vermicompost. With the new knowledge, Mohammed set about producing vermicompost to increase his crop production. A dedicated farmer of vegetables, fruits, and cereal crops, Mohamed fully replaced synthetic fertilizers with vermicompost for vegetables and fruits in his backyard and for cereal crops grown in larger plots away from his homestead.

The use of vermicompost has resulted in healthier crops with little or no sign of pest attack, eliminating the need for pesticides. This success has attracted the attention of other farmers in his neighbourhood, making Mohammed become a key resource person for the district agriculture office by providing training and inputs for 55 farmers beyond his village. He now plays an important role in the expansion of vermicompost beyond the Tehuledere district, providing vermicompost and vermiculture training for free to two districts via the Tehuledere district agriculture office.

Mohammed sells his surplus vermicompost to his neighbours to make an extra income. In the last four months of 2022 alone, he earned USD 1,000 by selling vermicompost and vermiculture. With the nationwide shortage of agrochemical inputs in Ethiopia since 2021, Mohammed's income from selling vermicompost and vermiculture has become even more critical for his family's economic well-being.

Mohammed's experiences and results with vermicompost have become a focus area for agriculture extension who are using vermiculture as a part of the solution to the agrochemical inputs shortage in Ethiopia. Mr Aragie Abate, an agriculture officer in the Tehuledere district, reported that the government, through the ministry of agriculture, is promoting composting technology through mainstream media and extension systems and training farmers on different composting techniques.

Mohammed's commitment to promoting vermicomposting technology and providing training to other farmers has made him an essential player in expanding vermicomposting beyond his village and improving the livelihoods of smallholder farmers in Ethiopia.

Rwanda

SCALING UP OF ORGANIC TECHNOLOGIES FOR PINEAPPLE AND STRAWBERRY

The University of Technology and Arts of Byumba (UTAB) in Rwanda has been implementing the Ecological Organic Agriculture Initiative (EOA-I) since September 2021. In this project, the university implements activities that are geared towards generating research-based knowledge and promoting its practical application in the field of organic agriculture. In the initial phase of the project, a baseline value chain analysis was conducted to identify knowledge gaps, needs, and priorities of various actors, with a special focus on women, youth, and marginalized groups in the pineapple and strawberry value chains in Gakenke, Rulindo, Muhanga, and Kamonyi districts. A one-day workshop was held in January 2022 to validate the baseline findings for dissemination.

The study revealed a number of gaps in the pineapple and strawberry value chains, such as a shortage of materials for mulching, insufficient organic fertilizers, and a scarcity of organic pesticides. To address these gaps, four technologies were developed: intercropping pineapple with *Desmodium intortum* and sweet potatoes for sustainable mulching in organic highland pineapple production; exploring the effectiveness of pest-repellent crops on pest management in strawberry farming; homemade organic fertilizers on pineapple production; and homemade organic fertilizers on strawberry production.

Prior to the establishment of the practice of intercropping sweet potatoes with pineapple, pineapple farmers used *Eragrostis variabilis* to mulch pineapple crops. However, they complained about the disadvantages of this practice, including its labour-intensive nature, low decomposition, and increase in temperature. Currently, experiments on the use of sweet potatoes as a green cover crop and food are showing promising results.

The study found that pathogens and pests cause yield losses and negatively affect the quality of produce, leading to complaints from farmers. To address these issues and support the integration of homemade technologies, the university has developed two technologies for organic fertilizers and organic pesticides capable of fighting against potential pests such as cyclamen mites, aphids, whiteflies, spittlebugs, flower thrips, chilli thrips, armyworms, and related Noctuid caterpillars. Strawberry diseases, such as leaf spots, grey mould, red stele, powdery mildew, Alternaria spot, black root rot, and black spot, were also identified.

Most of the raw materials used, such as *Tithonia diversifolia, Tephrosia vogelii*, Endod, and African marigolds, are locally available around the farmers' gardens. Farmers can also produce other ingredients, such as chilli, Carica papaya leaves, wooden ash, cow dung, and urine, to develop both technologies. The university obtained promising results from laboratory experiments, and they are now ready for application by pineapple and strawberry farmers from Gakenke, Rulindo, Muhanga, and Kamonyi Districts.

Tanzania

MECHANIZATION OF BIOPESTICIDE EXTRACTION FOR RURAL FARMERS IN TANZANIA

The practice of ecological and organic agriculture in Tanzania is increasingly becoming popular among rural farmers. This is because of the easy access to naturally occurring implements and resources needed to run a viable organic farming enterprise. However, as with other crops and livestock keeping, farmers face a big challenge with pests and diseases.

Organizations such as Sustainable Agriculture Tanzania (SAT), Tanzania Organic Agriculture Movement (TOAM), and the Participatory Ecological Land Use Management (PELUM) Association working in Tanzania under the auspices of the Ecological and Organic Agriculture initiative (EOA-I) support farmers in addressing some of the challenges faced when practising sustainable organic farming.

In the Mvomero district of the Morogoro region, farmers have for long used an extract from Neem leaves as a biopesticide in their farms to control a vast range of pests that destroy crops. However, getting the extract from the leaves is an arduous task for these farmers, relying on simple manual labour with crude tools.

According to reports recorded by EOA-I project partners, farmers mainly pound the leaves with a mortar and pestle to extract the biopesticide. Besides the extraction process being labour-intensive, farmers also reported regular skin irritation and chest infections, while the results of efforts only produced small volumes of the extract. In 2021, the EOA-I partners, collaborated with the Sokoine University of Agriculture (SUA) to fabricate two botanical extraction machines, one powered by electricity and one manually operated.

The machines were installed at the SAT Farmer Training Centre in Morogoro, where community members are continuously trained to use them and share in the extraction process. The mechanisation of the leaf pounding process has shortened the leaf pounding process and increased volumes of the extraction, much to the joy of the farmers.

Mercy Meena, a local farmer, used to spend an hour pounding at the mortar only to yield five kilograms of the extract. The manually operated machine can grind up to 50 kilograms of leaves per hour, while the electric machine goes through 500 kilograms of leaves within the same time frame.

“The machines will make our lives much easier. The cost of labour we incurred before and wasted time can now be focused on other profitable activities,” says Meena.

Hundreds of farmers have been trained at the SAT Training Centre on mechanised extraction and the effective application of biopesticide on their farms. This is part of the EOA-I objectives to enhance the capacity of organic farmers through innovations that augment their production and productivity.

Uganda

BORROWING FROM INDIGENOUS KNOWLEDGE FOR PRACTICAL SOLUTIONS: SUSTAINABLE HOUSEHOLD ASH-BASED STORAGE OF FRESH TOMATOES

To address the high cost of living beleaguering her, Dorothy Nankuta, a student at the Uganda Martyrs University, has developed a sustainable preservation formula that can impact the lives of many modest and low-income households. In 2019, Nankuta started self-motivated research to find a solution to preserving the highly perishable tomatoes.

Buoyed by support from Dr Marius Murongo, who linked her to the ecological organic agriculture initiative (EOA-I) for research support, Nankuta started trials to observe the decomposition of fruits when stored under different conditions. The conditions – doused in ashes from oily plants, Eucalyptus, sunflower, simsim and castor oil – are borrowed from witnessed rural preservation practised by her grandmother for other crops.

Nankuta decided to try this tactic on her tomatoes with astonishing results. Tomatoes have an average shelf life of three to five days, but when Nankuta preserved her tomatoes in the oily plants' ashes, the shelf life of the vegetable was longer with varied periods of durability depending on the type of incinerated plant.

The minimum number of days observed in this preservation method per type of ashes was 55 days for simsim ashes, 45 days for Eucalyptus, and 48 days for sunflower and castor oil. The control sample lasted 18 days to decompose. In some of the trials, the tomatoes lasted as far as 75 days.

According to Nankuta, the proposed plant ash preservation could save low-income households the expenses of tomato storage. The research results could also help smallholder farmers avoid losses associated with post-harvest storage of tomatoes.

The low cost and naturally organic nature of ash-based preservatives align with EOA's objectives to find sustainable and affordable innovations that address smallholder and low-income households' needs without damaging the environment.

Nankuta's research was partly supported by resources from the EOA-I under collaboration with Uganda Martyrs University in Nkozi, Uganda. More research is needed to validate these methods.

Get in Touch

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