

AfPEC Project Targets to Safeguard Ecosystems in Mt. Elgon Region through Agroforestry

*****Funded by DANIDA, Agroforestry for People, Ecosystems and Climate Change (AfPEC), a five-year project (March 2024-April 2029) focusing on Mt. Elgon Highlands in Eastern Uganda aims to foster to use agroforestry to prevent climate change and loss of biodiversity in the region. The project will focus on four districts namely: Mbale, Bududa, Bulambuli, and Kapchorwa. Project Partners: Makerere University, Aarhus University & University of Copenhagen (Denmark), Youth Leading Environmental Change (YLEC), Seniors without Borders, Forests of the World, Stjerne kommunikation, and Frelsen Kaffe. Through the project, coffee farmers in the region will be supported to export their coffee to Denmark.*

Overview

Climate change and biodiversity loss are emerging as two of the greatest environmental challenges facing humanity. In Uganda, natural ecosystems such as forests and wetlands contribute considerably to people's livelihoods and the national economy. However, rapid population growth has led to the degradation of these ecosystems due to increased demand for firewood and the conversion of land for agricultural purposes. Furthermore, the effects of climate change, including variable rainfall patterns and higher temperatures, are leading to a rise in the frequency and intensity of floods, droughts, landslides, windstorms and hailstorms (UNEP- Ecosystem-Based Adaptation in Uganda). Failure to tackle the effects of climate change threatens the achievement of the Sustainable Development Goals (SDGs), with catastrophic consequences that will hit the poorest and most vulnerable communities first and hardest (UCL Global Governance Institute, 2021). The United Nations Decade on Ecosystem Restoration 2021-2030 is a rallying call for the protection and revival of ecosystems around the world, for the benefit of people and nature. It aims to halt the degradation of ecosystems, and restore them to achieve global goals.

Agroforestry as a climate change adaptation strategy

Agroforestry, the purposeful integration of trees or shrubs with crops and/or livestock at the plot, farm, and/or landscape scale, is one potential climate change adaptation strategy to increase the resilience of farmers and agricultural systems against climate risk, providing a range of biophysical and socioeconomic benefits. As highlighted by the Intergovernmental Panel on Climate Change (IPCC) reports of 2022, agroforestry is a promising agro-ecological approach to climate change

adaptation because of the multitude of co-benefits that many agroforestry systems provide including, enhanced food security and income opportunities, the provisioning of ecosystem services, and biodiversity conservation (Amy Quandt, [et.al](#) 2023). Agroforestry significantly impacts the environment in diverse ways that contribute to both global environmental goals and local sustainability. Despite of the benefits, promotion, implementation and sustainability of agroforestry practices is still not well addressed.

Purpose of the AfPEC project

Coffee farmers in the Mt. Elgon Region in Eastern Uganda have traditionally with success used agroforestry that protects important water catchments and biodiversity hotspots, but these areas now experience degrading soils caused by external factors such as forest loss, soil erosion and population growth. Changes in climate have also affected farming conditions favouring more drought-resistant crops and agroforestry systems with well-developed shade. Agroforestry for People, Ecosystems and Climate Change (AfPEC), a new project funded by DANIDA aims to understand the factors that motivate coffee farmers to engage in agroforestry, and to foster the use of agroforestry to minimize the effects climate change and loss of biodiversity in the region. Specifically, the project aims to document the effects of agroforestry in terms of ecosystem services and livelihood benefits, to understand motivating factors for long-term sustainable development, and to support science-based agroforestry in practice. The project will focus on four districts namely: Mbale, Bududa, Bulambuli and Kapchorwa.

Specific objectives

The project will be implemented through five work packages in line with the objectives below;

1. Quantifying the potential of agroforestry in terms of ecosystem services -

Under this objective the focus is to assess the benefits of various agroforestry systems, including carbon sequestration, biodiversity conservation, and other ecosystem services. This research will help stakeholders understand the potential and limitations of different agroforestry approaches and contribute to mitigating climate change and biodiversity loss. Additionally, the findings will be used to select suitable native tree species for planting in highland coffee agroforestry systems.

2. Identifying livelihood benefits from agroforestry and key factors for long-term sustainable development.

3. Channelling scientific knowledge on agroforestry into practice – Given the urgent threats posed by biodiversity loss and climate change in Africa, it is imperative to translate scientific research into practical solutions. In collaboration with NGOs and local farming communities, the project team will disseminate user-friendly information and ensure that research findings directly benefit livelihoods and ecosystems. The goal is to increase local income through sustainable coffee production, carbon credits, and potentially, emerging markets for ecosystem services.

4. Building multidisciplinary capacity at university level - The project will train four PhD students from Uganda, and at least 12 master students from Denmark.

5. Promoting optimized agroforestry systems widely.

Partner Institutions

AfPEC is composed of seven partners: three university partners with multidisciplinary backgrounds, three Danish and Ugandan NGOs and a private communication company. All partners work in close collaboration with four coffee farmer communities. These include; Makerere University, Aarhus University (Department of Ecoscience), University of Copenhagen, Youth Leading Environmental Change (YLEC), Seniors without Borders, Forests of the World, Stjernekomunikation, and Frellsen Kaffe.

Project team

The overall PI is Dr Anne Mette Lykke from Aarhus University. At Makerere, the project is coordinated by Prof. John Tabuti from the Department of Environmental Management and Prof. Frank Mugagga from the Department of Geography, Geo-Informatics and Climatic Sciences. Other participants: Aarhus University, Department of Ecoscience (Jørgen Axelsen), Makerere University (Dr Josephine Esaete and Dr Kellen Aganyira), University of Copenhagen (Ida Theilade, Nerea Turreira Garcia, Stine Kroijer), Seniors without Borders (Poul Kroijer, Lone Jacobsen, Kjeld Lannig, Frans Theilby, Lars Brodersen, Jan Thorn Clausen, Hazra Okem, Ann Grace Apiita, Emmanuel Alituha, Christopher Ejiku), Youth Leading Environmental Change (Daniel Esayu, Annet Nakkazi, Richard Tusabe), Forests of the World (Jens Holm Kanstrup, Kristian Lybæk, Abiyu Lencho), and Stjernekomunikation (Jan Stjerne).

AfPEC Inception meeting in Mbale City

On 25th-26th September 2024, the project team held an inception meeting in Mbale City to get stakeholder buy-in and concretize roles of team members. The meeting was attended by 52 participants including the project team, farmers from

participating districts, RDCs from participating districts, representatives from the participating NGOs - Seniors without Borders, Youth Environmentalists leading Environmental Change (YLEC) and Forests of the World, and Graduate students attached to the project.

Presentations/remarks by the project team

In his welcome address, Prof. Frank Mugagga, one of the project coordinators at Makerere University appreciated participants for honouring and turning up for the workshop, noting that it was important for the team to establish a working relationship for smooth implementation of the project. Outlining the importance of research and partnerships towards the vision and mission of Makerere University, he expressed gratitude to the funders, and the Project PI, Dr Anne Mette Lykke for her unwavering efforts towards securing the grant.

Presenting an overview of the project, the lead Coordinator in Uganda, Prof. John Tabuti explained that although agroforestry systems have been around for long, their contribution has not been well understood and adopted. Discussing the different work packages, Prof. Tabuti said the project would document both negative and positive impacts of highland agro-ecosystems to improve their contribution to ecosystems and livelihoods.

At the meeting, the Project PI, Dr Anne Mette Lykke briefed participants on ethics and the rules governing the DANIDA AfPEC Grant. She presented the partnership grant agreement, highlighting the research ethics considerations, rules on publications, communication and dissemination requirements, and data sharing and management as guided by DFC. She urged the project team to familiarise themselves with the regulations to ensure timely delivery of the intended outputs.

In his remarks, the representative of farmer groups in Mbale District, also Chairperson of Bufumbo Agroforestry Group, Mr. Hussein Mafabi appreciated the project team and funders, noting that the initiative would greatly improve their skills in agroforestry. Highlighting the factors fuelling environmental degradation in the region, Mr. Mafabi decried the lack of a clear policy on plastic waste management, calling for support to avert the crisis. He emphasized the need to translate the project results into actual policy changes to further collaboration beyond AfPEC. “AfPEC has the support of local communities who are eager and willing to participate in the project activities,” he noted.

During the workshop, representatives from the partnering NGOs including Seniors without Borders, Forests of the World, and YLEC shared their experiences working in the region, outlining success stories in coffee agroforestry that the AfPEC project can leverage to achieve its targets. Prof. Jørgen Axelsen briefed participants on the biological pest control processes, whereas Dr James Johns from Forests of the World delivered a presentation on biomass and carbon sequestration in Uganda's smallholder agroforestry systems. Speaking to participants, Dr Poul Kroijer (Seniors without Borders) noted that through the AfPEC project, farmers in the region will be able to export their coffee to Denmark. The team expressed willingness to support the project activities.

Presentations by MSc and PhD students supported by the Project

AfPEC project will train four PhD students from Uganda, and at least 12 master students from Denmark.

During the workshop, three Masters Students from Aarhus University, Denmark and four PhD students from Makerere University who will be conducting research on different aspects of agroforestry in the Mt. Elgon Region, Eastern Uganda presented their research ideas to participants who provided enriching feedback. These are; Smilie Nielsen (MSc Human Security) who will be examining the factors that motivate young coffee farmers in Mt. Elgon Region to engage in agroforestry, Ms. Josephine Fogt Anderson (MSc Human Security) who will be studying women-nature relations in agroforestry and planting initiatives (How gender equality can be addressed in tree planting and agroforestry projects), and Ms. Matilda Willemoes who will be exploring the potential for carbon sequestration and storage in coffee Forestry systems.

The PhD students include Mr. Patrick Kayima who will study value chain and livelihood benefits of coffee agroforestry, and Ms. Patricia Adoch who will evaluate the influence of different management practices of coffee agroforestry systems on pollinators and pests in the Mt. Elgon Region. Ms. Joyce Lunyolo will conduct research on incentives for stewardship efforts in coffee agroforestry among farmers in the region, whereas Mr. Derick Kisegu will study and document the contribution of Arabica coffee agroforestry systems in mitigation and adaptation to climate change in fragile highland ecosystems of Uganda.

The students will be supervised by academics from the partner institutions namely: Prof Anne Mette Lykke, Prof. John Tabuti, Prof. Frank Mugagga, Dr.

Josephine Asaete, Prof. Ida Theilade, Dr. Kellen Aganyira, Prof. Stine Kroijer, and Prof. Katrine Gro Friborg.

Remarks by the Chief Guest

Addressing participants, the Deputy RDC Kapchorwa District, Mr. Martin Sakajja, on behalf of the Resident District Commissioners (RDCs) in the project area, expressed gratitude for the initiative noting that it holds immense significance for the country and world at large. “Agroforestry represents the fusion of agricultural productivity with ecological conservation—a synergy that is critical for sustainable development in our times. For generations, rural populations have depended on agriculture as their primary source of livelihood. Yet, we know the challenges farmers face: declining soil fertility, erratic rainfall, and dwindling forest resources. Agroforestry addresses these issues by promoting sustainable agricultural practices that not only enhance food security but also generate additional sources of income from forest products such as fruits, timber, and medicinal plants. Through this project, we envision empowering farmers to increase their yields while preserving the natural resources they rely on. By embracing agroforestry, we are not only reducing our vulnerability to climate change but also contributing to global climate goals. I commend Makerere University and all the partners involved in this project for their vision and dedication,” he noted.

Remarks by the representative of Makerere University

On behalf of Makerere University, Dr Henry Ssemakula appreciated the project team for the initiative noting that it aligns with the sustainable development goals (SDGs), the National Development Plan, and the Parish Development Model. “The project is also in tandem with our strategy of transforming Makerere into a research-led University responding to national, regional, and global development challenges, and contributing to global knowledge generation. Its commitment to capacity building through Masters and PhD trainings, community engagement, and internationalization is equally commendable.” He appreciated the funders for supporting AfPEC and several other projects in Uganda.

The workshop was moderated by Dr Josephine Esaete, Dr Vincent Muwanika, and Dr Kellen Aganyira from Makerere University.

On the final day of the workshop, the project team conducted a reconnaissance tour of three research sites namely; Bufumbo in Mbale, Buginyanya in Bulambuli District, and Sipi in Kapchorwa District.