ROBUST: Robusta coffee agroforestry to adapt and mitigate climate change in Uganda

Objective of the project

The overall objective of the project is to support sustainable economic development in Uganda by promoting and improving the Robusta coffee agroforestry (C-Af) farming system.

Background

In a recent context analysis[1], "several studies have confirmed that Uganda is vulnerable to climate change. This is likely to have significant implications for agriculture, food security, and soil and water resources". A more recent GCCA+ report[2] also pointed out the various constraints limiting the country response to the challenge such as:

Limited capacity at national and district levels to implement and monitor climate change project interventions

Weak community and institutional structures and arrangements for participatory decision-making process in identifying, assessing, and managing adaptation strategies

Low economic adaptive capacity due to high exposure to climate change impacts and limited households' access and ability to sustain adaptation strategies.

The coffee production sector in Uganda is not immune to these general constraints. It is one of the largest contributors to the country economy, providing over 20% of the country's foreign exchange earnings and supporting the livelihood of about one million farming households, but the sector is

[1] https://www.gcca.eu/programmes/adaptation-climate-change-uganda

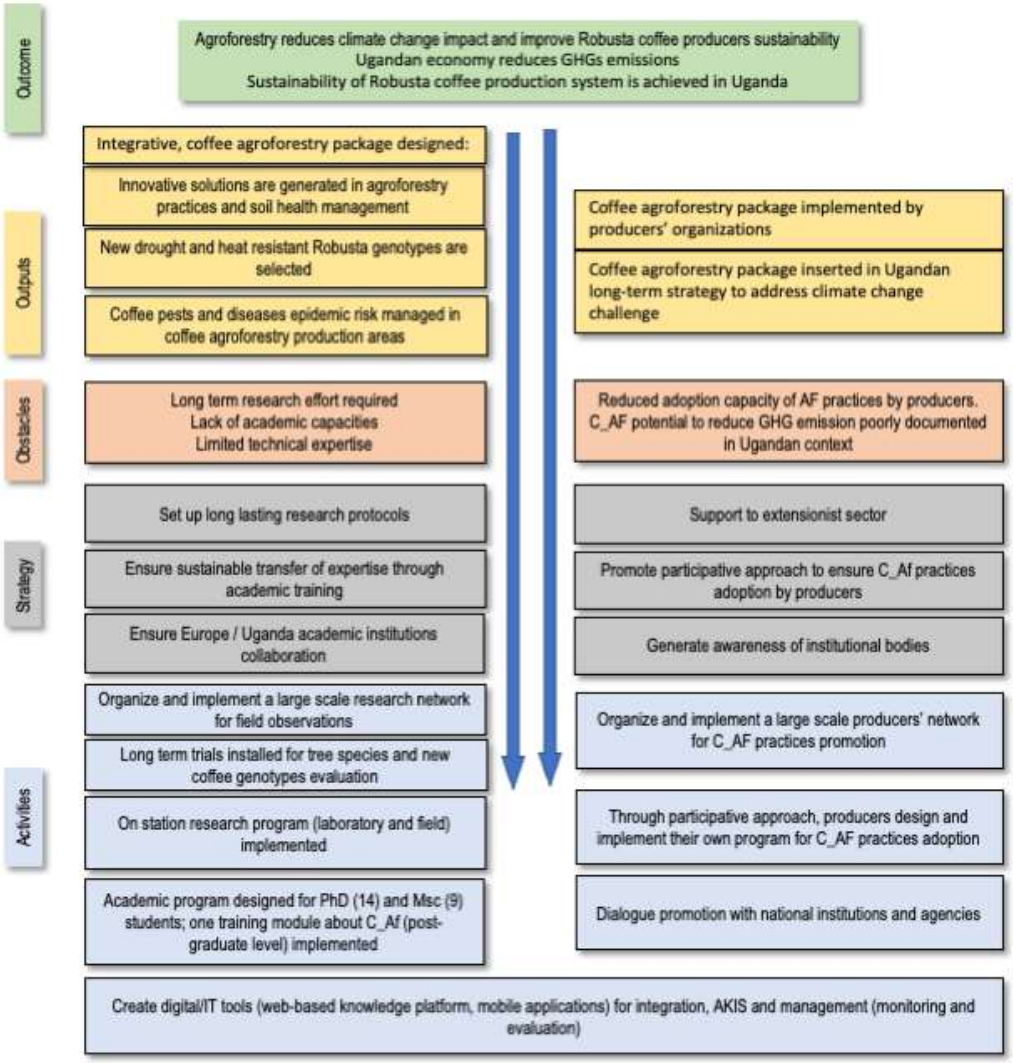
[2] K. N. Igbokwe and J.Kobusinge; 2018: Increasing climate change adaptation capacities of agriculture communities in Uganda. GCCA+ event (19thJune, 2018) at Adaptation Futures 2018; 18-21June 2018; Cape Town, South Africa

under the threat from the impact of climate change, expressed as the risk of decreasing productivity and incomes and outbreaks of emerging or invasive species.

Theory of change to achieve the objectives

The project aims to promote agroforestry in Robusta coffee production sector in Uganda as a means to counter the negative impact of climate change on people and the environment. To achieve this goal, it will operate in three different areas for various outcomes:

- Research, to design an integrated agroforestry package for coffee with improved sustainability and resilience performance;
- Collaboration with producers to promote the package definition and its adoption;
- Developing a multi-stakeholder approach, so that the package is integrated into Uganda's long-term strategy to address climate change challenges.



Research activities are expected to generate outputs that will expand the knowledge base of coffee agroforestry in Uganda. Several areas of investigation will be explored: silviculture to assess the benefits of different tree species when grown with coffee, soil science (water, nutrients, carbon) to design improved management practices, characterisation of the coffee microbiome to reveal the benefits of close interaction between the coffee tree and surrounding micro-organisms, coffee pests and diseases to evaluate the current and future risk of epidemics and how best to control them

according to agroecological principles, and coffee genetics to initiate a breeding program for drought and heat resistance in coffee.

Collaboration with producers will be implemented on a large scale, covering the entire Robusta coffee growing area in the country. It is expected that the project will interact with over 20 producers' organisations, in at least 10 different districts, along two geographical transects North/South and East/West. On the site of partnering cooperatives, the project will set up plots to carry out research on agroforestry, plant health and soil health, including monitoring of coffee pest and disease and environment characterisation (soil, landscape, climate). With these same cooperatives, the project will organise conventional training (information and technology transfer), but also a ongoing dialogue with farmers to understand their perception of agroforestry practices and guide the formulation and implementation of their own agroforestry "Action Plan" for coffee. It is expected that the connection of the two networks will generate a permanent interaction between the scientists and the producer communities, which will facilitate the definition of the agroforestry package of the integrative project. Based on these exchanges and training, the producers will design their own action plan to implement an agroforestry program at the community level. In permanent interaction with the project scientists, the producers will adapt their action plan throughout the duration of the project according to the progressively acquired research outputs.

Through the integrative approach, the project will monitor the process of adaptation and adoption of agroforestry practices by farmers, in order to detect at an early stage constraints that may hamper the adoption of innovations. The approach will be particularly detailed in the domain of ICTs in order to facilitate the use of new technologies (internet, mobile application, etc.) by farmers. In addition, the project will initiate and maintain a permanent dialogue with the national coffee sector to raise awareness of the coffee agroforestry package and its potential to increase the sustainability of the agriculture economic sector while reducing Uganda's GHGs emission. In this way, national institutions would recognise agroforestry as a valuable option for developing the coffee production sector and consider it as a component of the country strategy to address climate change challenge.

Main activities

To achieve its goal, the project is built on three main areas of activities:

Research station activities (Naforri and Nacori centres), such as trials and laboratory work, to implement complex protocols in a controlled or semi-controlled environment, **as well as academic training** (with contribution from all research partners), including student training (master's and doctorate) and post-graduate teaching of a coffee agroforestry curriculum.

Monitoring field networks: Covering the entire Robusta production area, the project will organise two connected networks for research and collaboration with producers.

Promoting IT tools integrated into a knowledge platform that will be designed within the project and adapted to the needs of users to ensure data collection, management, circulation, and integration. As such, the platform is seen as a relevant AKIS tool that will propose various access options depending on the end users (farmers, technicians, scientists, students, and general public).

Organisation

The project is organized in seven main work packages, combined into three components:

Research component (Lead: CIRAD)
- Tree diversification options (NaFORRI)
- Soil ecology in Robusta coffee agroforestry systems (NaFORRI, IRD, CIRAD)
- Genetic selection of Robusta coffee for drought and heat resistance (NaCORI, CIRAD)
- Epidemiology of pests and diseases of Robusta coffee: risk management in agroforestry and climate change contexts (NaCORI, Makerere Univ., *icipe*, CIRAD)

Development component (Lead: UCFA)
- IT tools for coffee research and value chain management (Strand, CIRAD)
- Dialogue with producers' organizations, agroforestry promotion, and technical transfer (UCFA, *icipe*)

Coordination component (Lead: CIRAD)
- Coordination including monitoring and evaluation, results integration, advocacy and dialogue with national authorities.

Governance
- The project is implemented by a "Coordination Committee" including all project direct partners; The committee is chaired by Cirad and operates on daily basis with support from co-coordinators from NaFORRI, NaCORI and UCFA. Among other activities, the Coordination Committee is in charge of the project management, M&E, reporting, and information circulation to the project's partners.
- Annually, the Coordination Committee present and discuss the project's achievements and work-plan to the Steering Committee where National Authorities (science, regulation, policy) are represented.

Implementing organisation

Centre International de Recherche Agronomique pour le Développement (**CIRAD**, France)

Project partners

Direct partners: National Forestry Research Institute (NaFORRI, Uganda), National Coffee Research Institute (NaCORI, Uganda), Makerere University (Uganda), Uganda Coffee Farmer Alliance (UCFA), International Centre for Insect Physiology and Ecology (*icipe*, Kenya), Institut de recherche pour le développement (IRD, France), Strand Life Sciences (India)

Third-Party partners: Wageningen University (The Netherlands), Padova University (Italy), International Women Coffee Association (IWCA, Uganda Chapter).

Project Associate: Bundibugyo Cooperative (Uganda), and Project contractors. Ecocharcoal Ltd. (Kenya)

Location	Uganda
Funding and co-funding	European Union: € 4.15 millions
	Partners: € 0.28 millions
Duration	Four years from 1 December 2021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UGANDA
COFFEE
FARMERS
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"Emwanyi bwe bugagga"


NARO


NaCOR
National Coffee Research
Institute


NaFORRI


MAKERERE UNIVERSITY


strand


WAGENINGEN
UNIVERSITY & RESEARCH


DAFNAE


icipe


cirad


IRD