

Introduction

The International Institute of Tropical Agriculture (IITA), as part of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), with CIAT, Sustainable Food Lab and Rainforest Alliance, are promoting increased smallholder coffee farmer adoption of Climate Smart Agriculture (CSA) practices in Uganda.

Initial IITA research on coffee began in 2010 and has subsequently expanded across 17 districts, 899 farmers, 51 on-farm field trials and 26 demonstration sites. IITA collaborates with Hanns R. Neumann Stiftung (HRNS) in Robusta coffee in Luwero and Olam, Kawacom and Great Lakes Coffee in Arabica coffee growing regions in Uganda.

CSA practices in coffee are practices such as planting shade trees and soil and water conservation structures, that are fine-tuned to the local context. Research concluded that CSA adoption is hindered, in part, due to limited resources and differing levels of entrepreneurship amongst smallholder coffee farmers in Uganda. In addition, farmer limitations and aspirations, farming systems, and climate change impact vary from site to site. Enablers of CSA adoption therefore need to be contextually specific to ensure they relate to local needs.

A suite of studies have been conducted to explore the diversity in Uganda's smallholder coffee farmers, their ranking of constraints to implementing CSA practices, and land use mapping to identify different ecological zones within a district.

Farmer Segmentation

Understanding the diversity of coffee farmers

An innovative approach was taken to farmer segmentation, through combining quantitative and qualitative approaches, to understand the diversity of coffee farmers. In addition to looking at the on-farm resources, the approach also captures farmers' entrepreneurship, aka their willingness to invest into coffee as their main cash crop. This diversity also highlights differences in ability to apply CSA practices on their farm. Through understanding this diversity, extension services can better target farmers according to their needs and aspirations. Figure 1 demonstrates the diversity of the farmers in Luwero from research conducted in 2016.

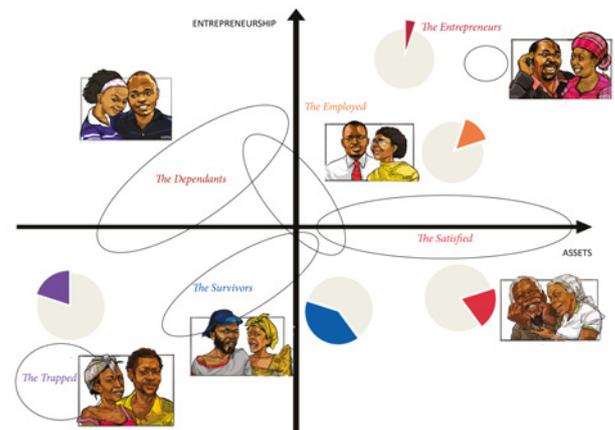


Figure 1. Diagram depicting the six segments of farmers in the district of Luwero, differentiated based on their level of entrepreneurship and the assets they own.

Ranking of Climate Smart Agricultural Practice

Understanding the limitations to CSA adoption

Adoption of CSA remains poor in Uganda, therefore research was carried out to understand which limitations farmers are facing. Research was conducted in Rakai in 2017. Through a ranking exercise, the farmers ranked a set of limitations for each practice. Results showed that there is a distinct difference between male and female perceptions on what the largest limitations are. Each ranking is contextually specific, thus there will never be an absolute limitation connected to a specific CSA practice.



Picture 1. Wilberforce Wodada, IITA, carrying out the CSA ranking exercise with a farmer in Rakai in 2017.

Land Use Mapping

Understanding the different agricultural zones.

Land Use Mapping is a participatory approach that defines different agro-ecological zones. Conservation areas are also defined as they are areas for climate change mitigation. The mapping workshop is attended by local government, private sector and other key actors in the district. Within each zone, participants identify key agricultural sectors. Within each of these sectors, key actors, challenges and possible solutions are identified. Figure 2 shows an example of a land use map made in Sironko in 2017, where conservation areas are being encroached on due to population pressure.

SIRONKO DISTRICT: AGRO-ECOLOGICAL ZONE MAP

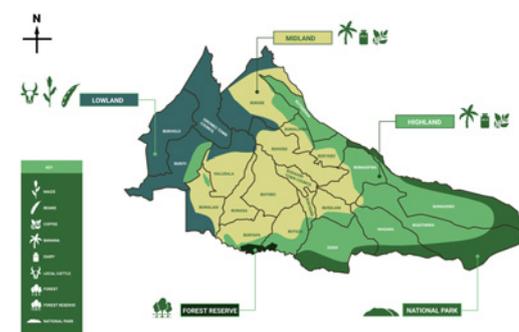


Figure 2. District of Sironko map based on agro-ecological zones.

The Stepwise Approach: rethinking extension in the coffee value chain

The lack of adoption of CSA practices is hindered by various factors, not least a lack of resources available to the farmer to implement the broad basket of good agricultural practices recommended in general extension trainings. By breaking down the basket of practices into smaller, incremental steps the IITA team has developed an innovative investment pathway (Stepwise) to make CSA adoption affordable for smallholder coffee farmers. Stepwise is easily adaptable to the varying needs and aspirations of coffee farmers and their ecological site differences and thus presents a contextually specific set of climate smart practices for each region. Stepwise has been developed through extensive multi-stakeholder consultations at the National and district levels. The approach is currently being piloted in two districts, which are showing positive early prospects.

National Level Stepwise

The first step in the Stepwise journey was the creation of a national level pathway for both Arabica and Robusta. Consultation with experts at the national level, including Uganda Coffee Development Authority (UCDA), the National Coffee Research Institute (NaCORI) and other members of the National Coffee Platform were held, the outcome of which was the National Stepwise Investment Pathway.

District Level Stepwise

The second step was to adjust the National level pathway to the specific context of the different coffee growing districts. Workshops were held at the district level with local district government, UCDA, NaCORI and private sector partners to evaluate and adapt Stepwise to the local context. Stepwise has so far been developed for 6 districts (Luwero, Nakasongola, Ntungamo, Rakai, Sironko and the Sebei Region).



Picture 2. Wilberforce Wodada, IITA, facilitating a group in adapting the national Stepwise Investment Pathway for Robusta in Uganda to the local context in the Rakai District, Uganda. Photo credit: John Francis Okiror, IITA



Picture 3. This photo shows the demo plot of Step 1 of the Stepwise in Luwero.



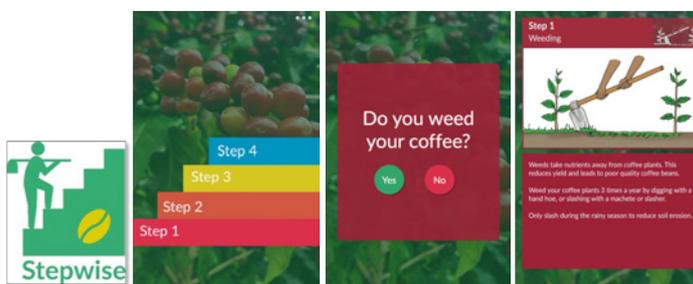
Picture 4. This photo shows the demo plot of Step 4 of the Stepwise in Luwero.

Stepwise Demonstration plots

Stepwise is being piloted on 26 farm trials in 3 districts (Luwero, Ntungamo, and Sironko) with direct implementation led by IITA's partners on the ground (HRNS and Olam). IITA researchers are supporting partners with data collection and monitoring of activities and learning. IITA researchers, with assistance from partners, are monitoring the impact of Stepwise on yield, pest and disease pressure and soil nutrition. In addition, the trials act as farmer field schools for farmers to visit and observe the 4 steps and the incremental increase in coffee quality and yield at each stage.

Stepwise Application for Smart Phones

To support the rollout of Stepwise, a mobile phone application is being piloted for use by coffee extension officers. The application allows the extension officer to walk through the Stepwise process with the farmer, prompting which practices are already being applied and which other practices would be most valuable to invest in. The application allows for the capture of the location of the farm and responses on applied practices, which makes it easy to follow-up and monitor the progress made. The Stepwise application is easily accessible and adaptable to different platforms and is being improved upon during the continuing pilot program with IITA partners HRNS and Olam.



Pictures 5-8. The logo and the button of the Stepwise application, followed by screenshots of the Stepwise application.

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The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), led by the International Center for Tropical Agriculture (CIAT), brings together some of the world's best researchers in agricultural science, development research, climate science and Earth System science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security. www.ccafs.cgiar.org.

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This is a brief report on interim research results, they are not necessarily peer reviewed. Please contact the authors for additional information on their research.