Achieving climate smart coffee in Bushenyi, Uganda

Key messages

- We make recommendations for future service deliveries to help farmers make the most of the opportunities from climate change.
- Global climate models project relatively favorable conditions for coffee production in the future in Bushenyi, compared to other global coffee regions with worse impacts.
- Future projections and observed trends show higher precipitation and increasing tempe rature, despite farmers reporting higher rainfall uncertainty, a perception that appear s to be influenced by recent variability.
- Climate-smart GAPs, specifically shade tree planning and management, trenching, mulching and cover crops play a crucial role i n mitigating negative impacts from climate change.
- Current, insufficient implementation of adapted farming practices is a ref lection of significant barriers .
- Workshops, trainings or provision of materials should therefore focus on these practices.

Coffee is a key cash crop for thousands of households in Bushenyi, Uganda. Because there is mounting evidence that climate change will affect global coffee production negatively, coffee sector actors are increasingly ready to engage in adaptation efforts. This document provides an evidence based prioritization of interventions to support coffee farmers in Bushenyi to adapt to climate change.

Download our detailed country study for Uganda here: https://hdl.handle.net/10568/101331

Download our study for the West African region here: https://hdl.handle.net/10568/103802

Coffee and climate change

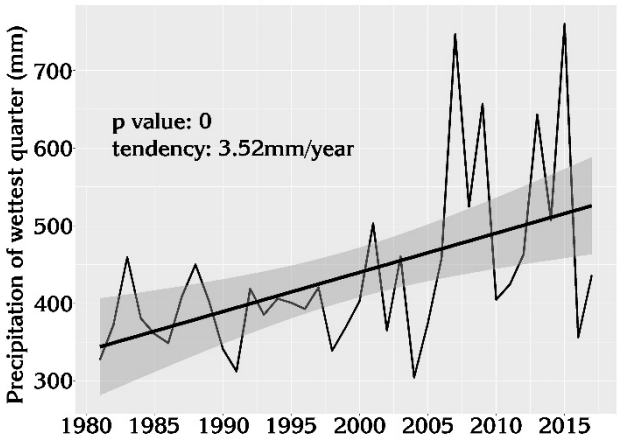
Farmers cannot always overcome the barriers to adoption of climate smart practices on their own. Wherever knowledge, financial, or other barriers to increasing resilience exist, stakeholders at all levels of the value chain should support farmers long -term plans for greater resilience, quality, and productivity in the face of climate change. Coffee farms in East Africa are vulnerable to an array of climate -related risks: Droughts, torrential and irregular rainfall. Climate chan ge is projected to increase the occurrence of such extreme events, as well as induce more gradual changes to coffee farming suitability via higher average temperatures and a higher seasonality of rainfall.

Climate Smart Coffee has a future in Bushenyi

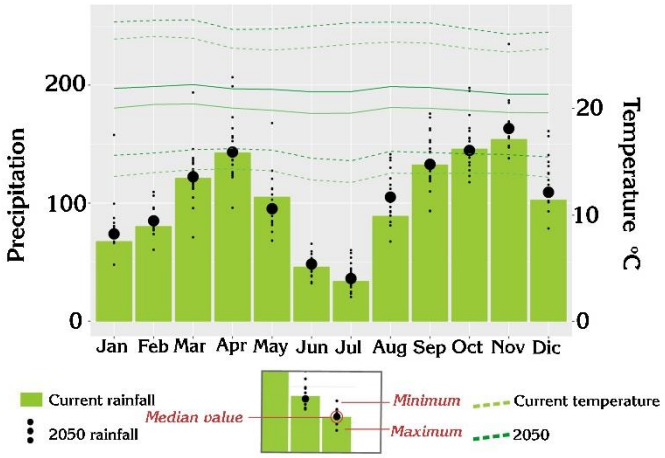
Within the global context, coffee production in Uganda was projected to be less affected than elsewhere, and within Uganda, the South West, including Bushenyi, may be less affected than other regions. Thus, the region is likely to not only remain suitable for both Arabica and Robusta production, but be a relative winner of global climate change.
Nevertheless, future climate conditions will be unlike the historic climate conditions. Using observed trend data, and climate model projections, we confirmed that t he seasonal distribution of rainfall will continue to become more extreme due to an increase of rainfall in the rainy season. Increasing temperatures are likely to increase water demand by the crop, but annual precipitation increases appear to outpace the increase in water demand. Coffee farmer's perceptions describe more detailed changes, which could not be confirmed using data analysis. For example, the perception of a late onset of the rainy season seems to be caused by recent events in years, but no lon g-term trend could be shown.

Perceived climatic and phenological changes over the past years.

Season	Change in season perceived by farmers
Main and minor rainy season	In all three districts, less rain at the beginning of the rainy seasons (March and September) is reported. Furthermore, farmers in Mitooma perceived rains to extent to December, while in Sheema a delay of the start of rains from August to September was noticed.
Main and minor dry season	More rainfall and humidity during both dry seasons was reported in all districts. In Sheema, the dry season was perceived to start earlier than usual (mid May instead of June).
Main and minor flowering season	Farmers perceive both, earlier and delayed flowering. Generally, farmers report scattered flowering across the season, compared to usual specific periods of the year.
Main and minor harvest season	Most of the farmers don't perceive a change in harvesting seasons. Some groups in Bushenyi and Sheema reported an earlier start of the harvest season.



Observed increase of precipitation during the main rain season in Bushenyi: about 100mm/year on average since 1980.



Climate model projections for Bushenyi. Dots show the range of rainfall projections, lines the mean future temperature

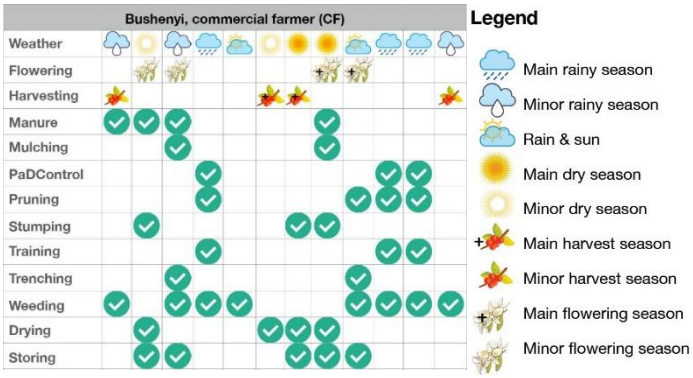
Community based adaptation to climate change

We identified priorities for adaptation using a participatory workshop approach. In multiple replications, we discussed the current cropping calendar with local farmers and extensionists, and identified potential to increase the resilience of farms through known cropping practices. With the 5Q approach -a simple concept to collect data- using interactive-voice response calls for building evidence knowledge, attitudes and skill, we collected feedback from 200 coffee producers about CSA practices adoption. Results showed about shade trees, for example, that 82.4% of farmers had heard about the practice and 83.3% of the ones that heard about it implemented them on their farm in the last year. Among the benefits of the practice, 63% of the farmers thought it especially good for better soil water retention. Farmers in the region already know these practices, so interventions towards better adaptation can leverage existing experiences, and seem to have a good understanding of the purpose and general benefits of GAPs. Most frequently mentioned constraints for their application were lack of labor, funds or knowledge. We also found that households optimize their practice portfolio depending on farm size and demographics. View the results of farmers' feedback about practices using the 5Q approach for Terracing, Mulching and Shade Tree.

Recommendations for interventions

- Technical workshops/trainings on how and when to train/bend coffee bushes.
- Future service deliveries, e.g. workshops, trainings or provision of materials should focus on practices like shade tree planting and management, trenching, mulching and cover crops, which are most suited to mitigate potentially negative impacts, because there are gaps in theoretical and technical knowledge. Some examples on services deliveries are:
  - Training on benefits of shade trees for general and extreme climatic conditions and technical guidance on the choice of shade tree species and shade tree management for optimizing canopy cover.
  - For soil erosion control: Information on when to best establish and manage trenches and workshops for knowledge transfer on benefits of cover crops
- Changing seasons require data based guidance for planting decisions. Seasonal forecast models need to have the skill to guide the timing of practices with a lead time of about four weeks, and need to be delivered using accessible means.

Representative cropping calendar.



For more information on the study contact: **Dr. Christian Bunn** (cbunn@cgiar.org)