



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



Feed the Future Africa Great Lakes Region Coffee Support Program (AGLC)

PROJECT CLOSING WORKSHOP REPORT

JUNE 26, 2018 - *Kigali, Rwanda*



Background

The Africa Great Lakes Region Coffee Support Program (AGLC) held a closing workshop in Kigali, Rwanda on June 26, 2018. AGLC is a three-year, USAID-funded collaborative initiative led by Michigan State University (MSU) aimed at strengthening the productivity and quality of specialty coffee in the Great Lakes Region through applied research and capacity building, and through policy support. In implementing this program, MSU partnered with University of Rwanda, the Institute for Policy Analysis and Research (IPAR) Rwanda, Polytechnic University of Gitega (Burundi), University of Gitega (Burundi), and the Global Knowledge Initiative (United States).

The AGLC program's goal is to raise on-farm productivity and increase quality by reducing the effects of antestia and the potato taste defect (PTD). Both of these goals serve to improve smallholder farmer incomes and help sustain the Africa Great Lakes region's reputation for producing some of the world's highest quality coffees. The bulk of program activities have taken place in Rwanda, however farmer surveys and experimental fields were implemented in Burundi as well.

The closing workshop for this project—which focused on AGLC's Rwanda components—provided an opportunity for the AGLC team to present findings, receive feedback from key stakeholders, and identify opportunities for growth and sustainability in Rwanda's coffee sector. Rather than focusing in detail on the project's methodology and the details of analysis conducted, the bulk of the workshop's time centered on discussions of the implications of research findings and forward-looking opportunities.

This report presents an overview of the workshop, with a special focus on panel discussions and ideas around moving the sector forward. Slides from research presentations can be found at: http://foodsecuritypolicy.msu.edu/resources/aglc_closing_workshop_june_26_2018.

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Overview: Workshop Welcome and Introductory Presentations

Introductory and closing remarks

Preceding and following the workshop, important project and sectoral stakeholders made brief statements welcoming participants and orienting them to the workshop’s focus. As the event began, Ms. Eugenia Kayitesi, Executive Director of the Institute for Policy Analysis and Research – Rwanda (IPAR), welcomed participants and expressed IPAR’s pride in partnering with US, Rwandan, and Burundian organizations to conduct this research.

In opening remarks, Dr. Celestin Gatarayiha, National Agricultural Export Development Board (NAEB) Coffee Division Manager, discussed NAEB’s role in regulation and support of the coffee sector. He discussed NAEB’s engagement with the AGLC project, and specifically highlighted the importance of motivating farmers to invest in their plantations. He noted that farmers will not invest if they do not have a good reason to do so. Dr. Gatarayiha also helped to close the workshop by summarizing topics covered and pledging NAEB’s continued support for the growth and sustainability of the coffee sector.

Finally, Dr. Sabinus Anaele, US Agency for International Development (USAID) Rwanda Acting Director of the Economic Growth Office, described the AGLC project and USAID’s view on its success. He stated that USAID Rwanda was satisfied with the work conducted by the AGLC team, and thanked them for their work.

Along with Dr. Gatarayiha, University of Rwanda professor and AGLC team member Dr. Daniel Rukazambuga spoke at the workshop’s close. Dr. Rukazambuga discussed the impact of the AGLC project on smallholder farmers, and thanked the many stakeholders who made the project a success.

Following opening remarks, the AGLC team (1) presented an overview of the AGLC project’s approach, (2) discussed challenges identified by stakeholders at the AGLC kick-off and what actions the project took on these challenges, and (3) described outcomes achieved by the project. On page 4, this report provides further description of stakeholder challenges, followed by the project’s top five outcomes (as identified by the AGLC team).



At top, left to right: Ms. Eugenia Kayitesi, IPAR; Dr. Celestin Gatarayiha, NAEB; Dr. Sabinus Anaele, USAID
 At bottom, left to right: Ms. Katie Bowman, GKI; Dr. Dan Clay, MSU; Dr. Alfred Bizoza, UR. All photos: MSU.

Challenges identified by stakeholders at AGLC Kick Off in 2015 and AGLC responses

See below for a list of top challenges identified by AGLC kick-off participants and actions AGLC took to address them. Note that these “themes” emerged from stakeholder discussions and do not directly align to AGLC focus areas. Full presentation link: http://foodsecuritypolicy.msu.edu/resources/aglc_closing_workshop_june_26_2018.

| | |
|--|--|
| <p>Theme 1: Inputs & Potato Taste Defect</p> <ul style="list-style-type: none"> • How might we understand the most effective pesticides? • How might we make enough fertilizer available to all farmers? • How might we encourage full implementation of integrated pest management (IPM)? • How might we improve knowledge on how to eliminate potato taste defect (PTD)? • How might we understand the necessary incentives to decrease PTD? | <p>How AGLC Addressed These Challenges</p> <ol style="list-style-type: none"> 1. Collected data on pesticide and fertilizer use, finding that many farmers do not use inputs and many who use them do not use enough. 2. Found that CEPAR input distribution is critical; most farmers do not purchase inputs on their own. 3. Through roundtable discussions, highlighted additional factors influencing input use, such as coop membership and gender. |
| <p>Theme 2: Improving Knowledge Dissemination to Farmers</p> <ul style="list-style-type: none"> • How might we make agronomic guidelines available to farmers? • How might we improve the information dissemination system along the coffee value chain? • How might we improve extension services to coffee farmers? • How might we improve knowledge on how to eliminate PTD? | <p>How AGLC Addressed These Challenges</p> <ol style="list-style-type: none"> 1. Collected data showing how incorrect input application negatively impacts productivity, profits, and safety. 2. Found that despite possessing less knowledge than men on antestia & PTD, female heads of household (HHH) report lower antestia incidence than male HHH. 3. Through roundtable discussions, heard that the issue is not that farmers do not know best practice; rather, they have <u>little incentive</u> to implement best practice. |
| <p>Theme 3: Market Factors</p> <ul style="list-style-type: none"> • How might we improve market access for farmers? • How might we connect coffee quality to coffee prices? • How might we address risks associated with coffee production? | <p>How AGLC Addressed These Challenges</p> <ol style="list-style-type: none"> 1. Data showed 2015 cherry floor price was 40% of average export price, with the rest going to processors, exporters, and export fees. 2. Found that coffee washing stations play critical role in determining coffee quality through training and quality assurance. 3. In roundtable discussions, talked about developing a multi-tiered cherry pricing system in which low-quality cherry is not accepted or accepted for lower price. |

Top five findings of the AGLC project

The following represent qualitatively important achievements made by the AGLC team. Though certainly not exhaustive, these are steps that team members are proud of and want to share with workshop participants.

| | |
|----------------|---|
| Productivity | <ol style="list-style-type: none"> (1) Derived accurate farmer cost of coffee production figures to inform debate on what prices farmers need to be paid to profitably cultivate coffee, and what prices incentivize farmer investment. (2) Proposed methods for coffee quality differentiation that could align incentives between farmers and coffee buyers such that farmers are better rewarded for investment in quality, and buyers have access to higher-quality, fully-washed coffee. (3) Identified farmers that would most benefit from additional support— financial, in-kind (e.g., fertilizer and pesticide), and extension—for example, women-headed households and very small-scale farmers. |
| Antestia & PTD | <ol style="list-style-type: none"> (4) In partnership with Rwanda Agriculture Board, determined the likely cause, of the potato taste defect, which is the “antestia bug,” and proposed antestia bug control approaches. |
| Cross-cutting | <ol style="list-style-type: none"> (5) Identified rationales and opportunities for investment in the long-term sustainability of Rwanda’s coffee sector. |

Research Session 1: Investment & Productivity

This section provides an overview of topics discussed related to farmer investment and productivity. Presenter and moderator Dr. Alfred Bizoza delivered brief presentations on each of the topics listed below. Panelists then responded to both the presentation as well as questions from workshop participants.

Panelists:

Dr. Celestin Gatarayiha, National Agricultural Export Development Board (NAEB)
Mr. Andrew Gerard, Michigan State University (MSU)
Dr. Maria Claudia Lopez, Michigan State University (MSU)
Mr. Isaac Nsanzamahoro, Dukunde Kawa Cooperative
Mr. Patrick Shema, Kinini Coffee
Mr. Max Veglio, Rwacof Export Ltd.

Presentations

Below find summaries of the challenge, findings, and discussion questions associated with each topic.

Farmer Investment

Challenge: Rwanda's strategic objectives express the need to raise coffee productivity and quality, increasing the share of coffee produced through fully-washed channel to 80%. How might we increase farmer investments in coffee?

Findings: The average cost of production of 177 RWF/Kg cherry provides a basis for understanding farmers' incentives. Farmers indicate that 300 RWF/Kg cherry is needed to invest in their coffee production.

Discussion Question: How can we ensure sustained incentives for both smallholder and largeholder farmers to invest in their coffee plantations?

The Price-Quality Relationship

Challenge: To reach the goal of 80% fully-washed coffee, policies may need to not only allow, but encourage separate prices for low- and high-grade cherry.

Findings: Farmers invest more in coffee when prices make production profitable. This improves quality and leads to higher volumes—trends that benefit all value chain levels. Insufficient cherry supply is one of the greatest challenges to coffee washing stations (CWSs).

Discussion Question: What standards and procedures can CWSs adopt in implementing a two-tiered cherry pricing system?

Geographic Zoning

Challenge: In 2016, NAEB introduced a zoning policy to allow for traceability and predictable coffee flows. However, reducing competition can have unintended effects. How has zoning affected farmers and other actors in its first two years?

Findings: In 2016, many farmers did not know what zoning was. Those who did were unhappy, believing it reduced wages. In 2017, more farmers knew of zoning, and views had largely changed.

Discussion Question: Given reduced competition between CWSs for cherry, how can we ensure farmers receive fair prices?

The Role of Cooperatives in the Coffee Sector

Challenge: How can we harness the power of collective action to improve coffee quality and productivity through cooperatives?

Findings: Coop members adopt best practices more often, have lower production costs, see increased productivity, and have higher margins than non-members. However, stakeholders note management problems that constrain coop success.

Discussion Question: How can we improve access to the benefits of cooperatives and enhance their effectiveness in coffee marketing?

The Role of Women in the Coffee Sector

Challenge: Traditionally, many coffee practices are male-dominated. However, women are important actors in the sector. Identifying the role that women play in coffee production is crucial.

Findings: Productivity is lower in female-headed households (HHs) than male-headed HHs. Female-headed HHs are different from male-headed HHs in aspects such as household characteristics, farm size, coffee production, etc.

Discussion Question: How might we attract more women into coffee production, especially at a younger age?

Panel Discussion and Q&A

Panelist responses:

Dr. Maria Claudia Lopez, MSU:

- Women face challenges in accessing training because of the timing of when trainings happen and their need to be at home.
- Many female heads of household are widows; what happens when women pass their land to someone else in their family?

Isaac Nsanzamahoro, Dukunde Kawa Cooperative:

- Floating helps with cherry density, which correlates to PTD.
- Dukunde Kawa's system for quality control has farmers sort by hand, then float, then the cooperative collector brings the cherry to the cooperative. Then they have floating machines at each site.
- They pay well, and also ensure that there is a second payment – this is important for farmer motivation.

Andrew Gerard, MSU:

- On zoning, it is possible that high cherry prices in 2017 influenced positive farmer perceptions on zoning.
- The government may want to consider a combination of relatively high farmgate prices and zoning, because in theory you no longer have competition to raise prices within zones.
- Additional research is needed on zoning enforcement differences; is it possible to allow small farmers to sell across zones while enforcing it for traders?

Patrick Shema, Kinini Coffee:

- On youth: if you want youth involved in coffee, bring technology into it. WeatherSafe is an example of a technology that brings coffee into the modern age.

Dr. Celestin Gatarayiha, NAEB:

- It is important to motivate farmers. For this, they need good prices. They also need technology and training
- Cherry price fluctuation is a problem. How can we protect cherry price and keep it consistent despite price fluctuation in international markets?
- We are not talking about two farmgate prices (two tiers); we are talking about one price for high quality prices. We do not want to promote bad quality cherries.

Max Veglio, Rwacof Export Ltd.:

- There needs to be better supply chains for inputs (fertilizer, pesticide); these are currently not readily available for sale in rural areas.
- It is important to look at costs of production at each stage of the value chain, not just the farm level.
- There is not currently traceability, despite zoning. Rwacof buys a large percentage of its coffee from traders or farmers who live outside of their zones. Rwanda needs to be careful about reputational risks associated with zoning.
- On certification, traceability is also problematic. Currently, some CWSs have certified and uncertified coffee being put together and sold as certified (most CWSs do not have separate channels for certified/uncertified).
- There are quality control problems which need to be dealt with – lots of low quality coffee in the sector.

Key quote: “Coffee production is in the hands of farmers. If the farmer is not motivated, he’s not going to implement what you’re telling him. Coffee is demanding, so without good prices, there is no incentive to produce.”

- Dr. Celestin Gatarayiha, NAEB

Q&A:

Question: **Matt Smith, Falcon Coffee:**

- Cooperatives are positive for members, but few farmers are in cooperatives. Does the government plan to increase that number through regulation?

Answer: **Dr. Celestin Gatarayiha, NAEB:**

- We need more farmers grouped into cooperatives. When they're in the cooperatives, it's easier. However, perhaps farmers are not getting benefits from cooperatives. Sometimes only a few farmers benefit.
- Zoning should help with cooperatives. Zoning is still not fully implemented – maybe 20% implemented. Competition between CWSs is there, and it is harming the sector.
- Zoning needs to be fully enforced, and then it will allow traceability to individual farmers.

Answer: **Max Veglio, Rwacof Export Ltd.:**

- Buying coffee is risky and requires financing. Banks need to figure out how to better work with cooperatives.

Answer: **Dr. David Ortega, MSU** (not on panel, but author of an AGLC paper on cooperatives):

- We have evidence from our survey on why farmers do not join cooperatives: 45% cited the initial fee of joining a cooperative was too high. The second reason why they did not join is that they were not invited to join. Then 15% said there was not a cooperative in their area.

Question/comment: **Pascal Kalisa, World Coffee Research:**

- In my experience, farmers do not invest even when prices are high. We need to invest in behavior change, and need to invest in young farmers who may have new approaches.

Question/comment: **Alex Uwizeye, RTI International:**

- I have a question on where certification fits into coffee production – benefits and safety. Is the environment safe enough for farmers?

Answer: **Max Veglio, Rwacof Export Ltd.:**

- With the exception of Fair Trade, certification gives you access to markets, not premiums.

Answer/comment: **Jean Marie Irakabaho, Rainforest Alliance:**

- Certification is not just about prices. It is about social responsibility and protecting the environment, as well as payment.
- We have had challenges with zoning in the first and second year; however, zoning creates traceability, which allows for better certification.

Question/comment: **Jean Paul Horanimpundu, Rwacof Export Ltd.:**

- Competition causes price fluctuation, but so does scarcity and scarcity of specific qualities. If we can have different prices for good cherry and bad cherry, this could help.



Panelists respond to questions. Photo: MSU

Research Session 2: Antestia & Potato Taste Defect

This section provides an overview of topics discussed related to the antestia bug and potato taste defect (PTD). Joseph Bigirimana and Dr. Daniel Rukazambuga presented new findings and updates on antestia and PTD research, and Andrew Gerard briefly presented recent findings on pesticide distribution. Dr. David Ortega facilitated a panel discussion and Q&A following these presentations.

Panelists:

Mr. Joseph Bigirimana, Michigan State University (MSU) and Rwanda Agriculture Board (RAB)
Dr. Celestin Gatarayiha, National Agricultural Export Development Board (NAEB)
Mr. Gervais Kayitare, KOPAKAMA Cooperative
Mr. Valens Nkeshimana, Coffee Exporters and Processors Association of Rwanda (CEPAR)
Dr. Daniel Rukazambuga, University of Rwanda (UR)

Presentations:

Factors Responsible for Occurrence of Potato Taste Defect in Coffee

Joseph Bigirimana, MSU & RAB

Findings in brief:

- Potato taste defect (PTD) is an off-flavor of coffee that reduces its value.
- PTD is associated with the presence of the antestia bug in Rwanda, but not the coffee berry borer.
- Fastac and pyrethrins are especially effective at controlling antestia and reducing PTD compared to Confidor and several other approaches.
- Pruning is important in conjunction with appropriate pesticides.
- Additional research is needed to identify specific mechanisms of PTD entry into coffee.

Discussion Questions: (1) For antestia, research recommends pruning plus spraying with Fastac or pyrethrins. Is this recommendation practical? How likely is it to be adopted by farmers? (2) Based on what has been found through research thus far, what else needs to be understood in order to control PTD?

Control of Antestia/PTD and Improving Coffee Productivity in Rwanda

Dr. Daniel Rukazambuga, UR

Findings in brief:

- Antestia can destroy up to 30% of coffee cherries in a plantation if uncontrolled.
- Antestia bugs like thick canopy and old, untended trees as well as flat areas/valleys with low air circulation.
- One pesticide application per season is insufficient to control antestia.
- His team is currently analyzing data from experiments at 64 farms on controlling antestia and PTD through on-farm and processing (e.g., floating) approaches.

Discussion Questions: (1) What is stopping farmers from effectively controlling antestia? (2) What barriers keep farmers and CWSs from effectively sorting cherry?

Pesticide distribution

Challenge: Since CEPAR took over purchase/distribution of pesticide, more farmers receive pesticide than in the past. However, stakeholders suggest improving distribution further. How can we fill remaining gaps in distribution?

Findings: The percentage of farmers using pesticide increased from 68.85% (2015) to 75.59% (2017). Gaps in usage by cooperative membership and farm size shrunk. However, female heads of household remain less likely than others to receive pesticides.

Discussion Question: Despite increases in pesticide use, women are less likely than men to use it. How can we ensure trees belonging to women receive pesticide treatment?

Panel Discussion and Q&A

Panelist responses:

Valens Nkeshimana, CEPAR:

- Since 2014, CEPAR has collected export fees and purchased fertilizer and pesticides. Previously, NAEB had taken this role.
- Based on work with NAEB and RAB, CEPAR switched distributed pesticide from Confidor to Fastac in 2016.
- Appropriate volumes of pesticide are available, however there is a problem in that there are limited spraying tools available.

Dr. Daniel Rukazambuga, UR:

- Farmers know how to prune and mulch, however there is limited pesticide. For example, you cannot find Fastac at stores.
- Pesticide application needs to happen twice, not once. It needs to be timely application.

Joseph Bigirimana, RAB/MSU:

- It is good to hear that RAB's advice to use Fastac rather than Confidor has been taken up by CEPAR.
- It is important to rotate the chemistries of pesticides so that insects do not develop a resistance.
- It is also important to think about mating disruption and biological control as approaches to antestia control.

Gervais Kayitare, Kopakama Cooperative:

- Kopakama is trying to implement integrated pest management (IPM), starting with good agricultural practices.
- They bought their own materials such as sprayers.
- They are experimenting to see if floating cherry can reduce the incidence of PTD.

Dr. Celestin Gatarayih, NAEB:

- Key to IPM is that it is important to combine practices (e.g., spraying, pruning, etc.).
- We need to determine why some areas with antestia have PTD and others do not; there is an association, but we do not know *why* there is one.
- Sprayers need to reach farmers, however this is still a problem. Currently, NAEB has coffee competitions and give sprayers as prizes.
- However, incentives (like prices) also matter. If there is no incentive to control pests, nothing will change.

Q&A:

Question: Dr. Dan Clay, MSU:

- Is it an option to hire sprayers for fields instead of having farmers do their own spraying?

Answer: Dr. Celestin Gatarayih, NAEB:

- This could work (and does work in some countries), however it cannot be managed by government or it will not be sustainable. If sprayers are hired by CWSs, that is sustainable.

Answer: Dr. Daniel Rukazambuga, UR:

- Some places already hire sprayers. It could possibly be required for CWSs by zoning.
- It is important with pesticide to target older trees, because those are more likely to have antestia. You can determine tree ages from the coffee tree census.

Answer: Gervais Kayitare, Kopakama Cooperative:

- Kopakama had to develop a pesticide spraying system to be in accordance with Rainforest Alliance.
- Some sprayers visit farms, others make sure that farmers who are doing their own spraying have proper protective equipment.

Key quote: "Increased pesticide application is good news, but in the long-term it's bad news because we have a production system dependent on chemical application."
- Jean Marie Irakabaho,
Rainforest Alliance

Question: **Patrice Hakizimana, USAID:**

- Organizational capacity and input access are critical. What can be done to improve extension services?

Answer: **Dr. Celestin Gatarayihya, NAEB:**

- Extension is a challenge. We have one person at the district level and some at the province level.
- It is important for private sector to be involved in extension, and for CWSs to hire extensionists.
- There are problems of farmers selling fertilizer or using it on other crops, which extensionists could help with.

Question/comment: **Jean Marie Irakabaho, Rainforest Alliance:**

- Pesticide sprayers can cost USD \$100. That is too much for one farmer to pay. Is it possible for a group of farmers to purchase one?
- You don't want to create a system of dependence (on government) for spraying.
- What is the current understanding of the link between antestia and fungus in causing PTD?
- On IPM, we need a written manual for farmers with pictures and text in Kinyarwanda.

Answer: **Dr. Celestin Gatarayihya, NAEB:**

- PTD is caused by microbes entering the cherry and developing chemicals that smell. But we do not know how the microbes enter or where they come from.
- It is not good to apply a lot of pesticide – we know this. It is better to scout and spray than to blanket spray.

Question/comment: **Modeste Uwimana, Teuscher Invest Ltd.:**

- It is important for NAEB to focus on pruning – farmers do not understand it's importance.

Presentation: Making the Case for Coffee as a Pillar for Sustainable Growth in Rwanda

Dr. Dan Clay, MSU

Following the research presentations, Dr. Dan Clay made the case for more robust investment in coffee as an engine of sustainable growth. This presentation, which was followed by a brief Q&A, served as a provocation for an interactive activity focused on opportunities and questions going forward.

Findings in brief:

- Coffee can support sustainable economic growth, but it is not prioritized in Rwanda's policies and strategies.
- Seven reasons to invest in coffee:
 - (1) Coffee is historically Rwanda's top source of export earnings and economic growth.
 - (2) Coffee affects over 350,000 farmers and their families, and that income is used to improve well-being and livelihoods.
 - (3) Coffee has positive effect on food security.
 - (4) Specialty coffee is in high and growing demand worldwide.
 - (5) Specialty coffee has price stability in international markets (compared to ordinary coffee).
 - (6) Comparative advantage: Rwanda stands out in specialty coffee.
 - (7) Coffee is environmentally superior to most other crops.

Question: **Dr. Alfred Bizoza, UR:**

- What is the potential for currently empty/unfarmed land to be used for new coffee plantations?

Answer: **Dr. Dan Clay, MSU:**

- Good point – we may be able to farm new land and expand plantations that way.
- Also, can we support young people as we develop new plantations?

Question/comment: **Dr. Celestin Gatarayihya, NAEB:**

- New plantations are possible, but it is challenging. One challenge is that food is a priority for the government and that competes with coffee.

- The focus could be on marginal land, but coffee does not want marginal land either. The cost of production can become high on marginal land. However, we can prioritize this and improve those marginal lands for coffee production.

Answer: **Dr. Dan Clay, MSU:**

- It is true that marginal land is difficult, and often already eroded. Organic matter helps this, though, so coffee may be able to help revive some marginal land.

Question: **Patrice Hakizimana, USAID:**

- You have talked about the environmental benefits of coffee, but is coffee climate resilient?

Answer: **Dr. Dan Clay, MSU:**

- In some ways, climate change is less problematic for coffee than other crops. And Rwanda has a positive outlook in Rwanda in climate forecasts.
- Farmers say coffee is more resilient than many crops. The riskiest crops due to climate shocks are maize and beans.
- However, coffee is riskiest when it comes to price shocks. Despite climate resilience, it is currently a risk for farmers.

Interactive Activity: Opportunities and Questions to Support Sustainability and Growth in Coffee

Building off of Dr. Dan Clay's presentation on sustainability of the coffee sector, facilitators asked participants to split into groups to discuss opportunities and questions related to (1) productivity, (2) antestia/PTD, and (3) sustainability. Within each topic, participants considered the question: How might we support the sustainability and growth of the coffee sector? Participants identified opportunities to do so, as well as questions that would need to be answered. Please find below a consolidated list of opportunities (page 12) and questions (page 13), organized by thematic area, which is designated in bold.

| Opportunities | | |
|---|--|--|
| <p><u>Productivity</u></p> <p>Improving prices and access to credit</p> <ul style="list-style-type: none"> - Timely payment to farmers - Innovative credit solutions - Consistent and good farmgate price - Market linkages in setting farmgate price <p>Ensuring farmers can use inputs and GAP to produce quality coffee</p> <ul style="list-style-type: none"> - Pick cherries when mature & float before weighing - Improved inputs accessibility - Use organic fertilizer - Use mineral, organic fertilizer on time with recommended dose - Control pests and diseases on time - Environmentally friendly agronomic practices - Cover crops to fill mulching material gap - Shade trees to avoiding water stress, enhance nutrient uptake <p>Mitigating risks of investment</p> <ul style="list-style-type: none"> - Engage insurance companies to protect investment in coffee - Explore price hedging instruments <p>Professionalizing coffee sector</p> <ul style="list-style-type: none"> - Remove coffee middlemen - Farm coffee as professional business (e.g., use record keeping) <p>Investing in science and technology</p> <ul style="list-style-type: none"> - Create new varieties - productive, climate resistant, high quality - Apply solar irrigation during dry season <p>Ensuring gender equity in coffee</p> <ul style="list-style-type: none"> - Support involvement of men and women in coffee production <p>Encouraging youth involvement in coffee</p> <ul style="list-style-type: none"> - Youth entrepreneur empowerment <p>Government investing in sector</p> <ul style="list-style-type: none"> - Invest more in coffee sector - Increase extension services | <p><u>Antestia & PTD</u></p> <p>Leveraging existing human capital</p> <ul style="list-style-type: none"> - Human resources to conduct research <p>Involving private sector in input distribution</p> <ul style="list-style-type: none"> - Improve optics of inputs not just coming from government / CEPAR - Empower the private sector for input distribution <p>Leveraging global specialty coffee market strength</p> <ul style="list-style-type: none"> - There is a stable market for specialty coffee - There are high global prices for specialty coffee <p>Developing innovative pest control approaches</p> <ul style="list-style-type: none"> - Develop pheromone traps - Assess how farmer proximity relates to antestia infestation <p>Maximizing complementarity between approaches</p> <ul style="list-style-type: none"> - By controlling antestia farmers increase quality <i>and</i> productivity - Farmers can use the same inputs to control PTD / antestia <p>Building off existing distribution channels</p> <ul style="list-style-type: none"> - Can build off existing input distribution channels - Work with coops for input distribution | <p><u>Sustainability</u></p> <p>Capitalizing on environmental benefits of coffee</p> <ul style="list-style-type: none"> - Use carbon credits as related to coffee farming - Eco-tourism in coffee - Conservation plantations - Market environmental benefits of coffee <p>Expanding coffee production & sale</p> <ul style="list-style-type: none"> - New coffee land can lead to improved livelihoods - Improving irrigation <p>Identifying biodiversity benefits</p> <ul style="list-style-type: none"> - Intercropping banana and coffee - Bees + coffee flowers = honey - Use of shade trees <p>Repurposing coffee waste</p> <ul style="list-style-type: none"> - Composting coffee pulp - Using pulp as a tea |

| Questions | | |
|--|---|--|
| <p><u>Productivity</u></p> <p>Sharing benefits across the sector</p> <ul style="list-style-type: none"> - How might benefits be shared to all actors in the coffee value chain? <p>Improving prices and access to credit</p> <ul style="list-style-type: none"> - How might we confront coffee price instability on global markets? - How can we improve financing; specifically relationships between coffee farmers and banks? <p>Ensuring farmers can use inputs and GAP to produce quality coffee</p> <ul style="list-style-type: none"> - How might we increase available inputs? - Can we update soil maps and connect them to a long-term fertilizer plan? - Can intercropping banana and coffee increase production and income? - What is the best way to intercrop? <p>Professionalizing coffee sector</p> <ul style="list-style-type: none"> - How can we produce coffee on big, consolidated pieces of land? - Investors need records to get bank loans. How can farmers get them? - How can we improve record keeping for farmers and other value chain actors? <p>Investing in science and technology</p> <ul style="list-style-type: none"> - How should we include technology in extension services? <p>Ensuring gender equity in coffee</p> <ul style="list-style-type: none"> - How do we attract and give support to women without disenfranchising men? <p>Encouraging youth involvement in coffee</p> <ul style="list-style-type: none"> - How might we improve access to capital for youth? - Coffee is a long-run investment, but youth need income now. How can we ensure that young people can invest? <p>Government investing in coffee</p> <ul style="list-style-type: none"> - How can Rwanda's government increase investment in the coffee sector? - To what extent are Rwanda's resource allocations (related to agriculture) aligned with objectives in Vision 2020 and EDPRS? | <p><u>Antestia & PTD</u></p> <p>Better understanding of most effective inputs</p> <ul style="list-style-type: none"> - What are the most effective pesticides for pest disease management? - How might we develop fertilizer formulas for different areas? <p>Better understanding of PTD</p> <ul style="list-style-type: none"> - How big is the loss from PTD in dollars? - How can PTD be detected easily as early as possible? <p>Disseminating research</p> <ul style="list-style-type: none"> - How might we ensure effective dissemination of research? <p>Increasing effective input use</p> <ul style="list-style-type: none"> - How might we reduce the cost of inputs? - How can farmers be incentivized to properly use inputs (proper amount and proper timing)? - How do we target regions / communities that need inputs most? - How might we ensure appropriate use of pesticides (to mitigate issues of resistance)? <p>Improving access to information</p> <ul style="list-style-type: none"> - How can farmers see a benefit long term for their work? Is there a way traceability can help incentivize whole communities? - How can information be shared across actors? | <p><u>Sustainability</u></p> <p>Capitalizing on environmental benefits of coffee</p> <ul style="list-style-type: none"> - How can we connect climate and agro-tourism? <p>Policy leadership</p> <ul style="list-style-type: none"> - What is the mandate (government) regarding this issue? <p>Sectoral coordination</p> <ul style="list-style-type: none"> - How do we bring together the private and public sector to collectively address environmental issues? - Are we working together / cohesively on this topic? <p>Financing environmental activities</p> <ul style="list-style-type: none"> - Is there funding available for environmental activities in coffee? <p>Mitigating environmental effects of coffee production</p> <ul style="list-style-type: none"> - How can we use and pollute less water? <p>Availing organic material</p> <ul style="list-style-type: none"> - How can we overcome the issue of insufficient mulching material? |

Annex I: Agenda

Africa Great Lakes Region Coffee Support Program (AGLC) Closing Workshop Tuesday, 26 June, 2018 – Marasa Umubano Hotel, Kigali

8:00 AM: Registration

9:00 AM: Welcome from AGLC team, USAID, and Rwanda partners

Welcome: Ms. Eugenia Kayitesi, Executive Director, Institute for Policy Analysis and Research – Rwanda

Opening remarks: Dr. Celestin Gatarayiha, Coffee Division Manager, National Agricultural Export Development Board

Opening remarks: Dr. Sabinus Anaele, Acting Director Economic Growth Office, US Agency for International Development

9:45 AM: Overview of project and findings

Presenters:

Dr. Dan Clay, Michigan State University

Ms. Katie Bowman, Global Knowledge Initiative

Dr. Alfred Bizoza, University of Rwanda

10:15 AM: Coffee break and group photo

10:45 AM: Overview of research findings part 1: Farmer Investment & Productivity

Presentation, panel discussion, and moderated question and answer

Moderator: Dr. Alfred Bizoza, University of Rwanda

Panelists:

Dr. Celestin Gatarayiha, National Agricultural Export Development Board

Mr. Andrew Gerard, Michigan State University

Dr. Maria Claudia Lopez, Michigan State University

Mr. Isaac Nsanzamahoro, Dukunde Kawa Cooperative

Mr. Patrick Shema, Kinini Coffee

Mr. Max Veglio, Rwacof Export Ltd.

12:00 PM: Lunch

1:00 PM: Overview of research findings part 2: Antestia & Potato Taste Defect

Presentation, panel discussion, and moderated question and answer

Moderator: Dr. David Ortega, Michigan State University

Panelists:

Mr. Joseph Bigirimana, Michigan State University and Rwanda Agriculture Board

Dr. Celestin Gatarayiha, National Agricultural Export Development Board

Mr. Gervais Kayitare, KOPAKAMA Cooperative

Mr. Valens Nkeshimana, Coffee Exporters and Processors Association of Rwanda

Dr. Daniel Rukazambuga, University of Rwanda

2:45 PM: Coffee break

3:15 PM: Perspective: Ensuring the sustainability of Rwanda's coffee sector

Dr. Dan Clay, Michigan State University

3:30 PM: Interactive activity: Top opportunities and questions for research and action

4:30 PM: Closing thoughts and reactions

5:00 PM: Reception

Annex II: Workshop Attendance List

| No. | Name | Institution | Designation | Email | Phone No. |
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