

Community Revenue Enhancement through Agricultural Technology Extension (CREATE) Rwanda Project Mid-term Impact Evaluation



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List of Acronyms

BRALIRWA	Brasseries et Limonaderies du Rwanda
Coop	Cooperative
CREATE	Community Revenue Enhancement through Agricultural Technology Extension
DAP	Diammonium Phosphate (fertilizer)
EUCORD	European Cooperative for Rural Development
FtMA	Farm to Market Alliance (ex Patient Procurement Platform, PPP)
FGD	Focus Group Discussion
GoR	Government of Rwanda
HH	Head of Household
IFC	International Finance Corporation
IPM	Integral Pest Management
KII	Key Informant Interviews
KPI	Key Performance Indicator
JADF	Joint Action Development Forum
LTR	Land Tenure Regularization
MFI	Micro-finance institution
Minagri	Ministry of Agriculture
Minbuza	Ministerie van Buitenlandse Zaken/Ministry of Foreign Affairs of the Netherlands
MT	Metric Tonnes
NGO	Non-governmental Organization
OPV	Open Pollinated Variety
P4P	Purchase for Progress
PASP	Climate Resilient Post-harvest Agribusiness Support Project
PHH	Post-Harvest Handling
ProDev	ProDev Group Holdings
PSDAG	Private Sector Driven Agriculture Growth
Rwf	Rwandan Francs

RRA	Rapid Rural Appraisal
RWARRI	Rwanda Rural Rehabilitation Initiative
USAID	United States Agency for International Development
USD	United States Dollar
WB	World Bank
WFP	World Food Program



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Executive Summary

Introduction

This report presents the main findings from a mid-term impact evaluation for the CREATE Project in Rwanda. The purpose of this report is to provide the project implementers with relevant and timely data on the opinions and experiences of multiple stakeholders within the project. The research conducted was designed to measure achievement of the projects objectives, namely to improve cooperatives, maize cultivation, post-harvest, access to credit, partnerships, marketing, transportation, leadership and management, climate resilience, and access to finance.

The research for this evaluation was conducted in two mediums: focus group discussions (FGD) and key informant interviews (KII). An FGD was held with approximately 5 men and 5 women from each of 25 out of the 26 EUCORD cooperatives, 4 RWARRI cooperatives, and 4 control group cooperatives that do not work with CREATE. Control group cooperatives were chosen by EUCORD's project coordinator and the district agronomists based on meeting the qualifications EUCORD uses in choosing cooperatives for the project including membership, organization, and plot size. These cooperatives are possible additions to the project. FGD questions are in Annex 2.

KIIs were also conducted with WFP/FtMA, RWARRI, ProDev, MINIMEX, banks, PASP, an intermediary maize trader, district agronomists, BRALIRWA, and EUCORD agronomists, as well as informal KIIs with other NGOs.

Findings

Throughout the FGDs farmer changes and challenges fit into 9 general areas: cultivation training, inputs, market, post-harvest, credit, transportation, irrigation, perception, and financial management. Each will be discussed in more detail below. Table 1 shows the number of cooperatives in each of the three groups (EUCORD, RWARRI, and the control group) that specifically mentioned progress or challenges in each category. Some cooperatives mentioned both progress and remaining challenges in a single area and are coded for both. Cooperatives placement in the table is based on coding their responses, not based on asking them to rank themselves on the chart.

Table 1: Cooperative Changes and Challenges within the Project Categories

	Positive Change/Success			Challenge		
	EUCORD (25)	RWARRI (4)	Control (4)	EUCORD (25)	RWARRI (4)	Control (4)
Cultivation	24	4	4	7	0	1
Inputs	23	3	3	10	1	3
Market	22	4	0	8	3	4
Post-Harvest	25	4	3	19	3	3
Credit	12	3	1	12	2	3
Transportation	2	1	0	13	3	1
Irrigation	5	0	1	19	1	4
Perception	6	3	1	3	0	0
Financial Management	18	4	1	12	0	2

The table shows that post-harvest and credit are a tipping point for CREATE. Categories before that show great improvement while categories after that show more challenges than improvements. Financial management is the exception as it carries throughout the life of the project adapting to the progress of the cooperative and thus has high levels of improvement and challenge.

Cultivation and Production: Every FGD mentioned an increase in production. They speak of improved farming techniques, higher production, access to machinery, visible changes in their fields, and increased income. Farmers listed trainings around fertilizer use as the most helpful aspects of the project. Farmers also reported high appreciation for and faith in the EUCORD agronomists because they always follow up and fulfill their promises. As one KII said, when an organization wants to work with farmers in Kayonza, they go to EUCORD first because their agronomists have the on the ground knowledge and relationships. The average EUCORD farmer perceives his or her production to have increased by a factor of 4, while the average for RWARRI was 5, and 3.5 for the control groups.

Some farmers still struggle with obtaining the quality of maize required by ProDev because they lack the post-harvest skills, lack equipment, or do not process all of their production at the same time. Some lack of the means to implement what they have learned. Others have poor transfer of knowledge from the few individuals trained to the rest of the cooperative.

Trainings: Trainings and knowledge were consistently ranked as the most helpful aspects of the project by participants. Table 2 below shows the results of asking EUCORD cooperative members to vote for which training was most helpful. Not all of the cooperatives received record keeping trainings and fewer mentioned management training in connection with EUCORD (meaning it was not a voting option). In both cooperatives where I interviewed men and women separately, the women were unable to participate because they had not attended any of the trainings.

Table 2: Most Helpful Trainings by Gender

	Cultivating/Fertilizing	Post-Harvest	When/Where to Sell	Record Keeping	Management
Men	47%	23%	12%	16%	2%
Women	58%	24%	10%	9%	0%

Farmers preferred demos to trainings. Farmers listed the following topics as trainings that would be most useful in the future: record keeping, more members trained on the same topics, cultivation refresher, cooperative management, working with other cooperatives, and using/fixing machines. Trainings face three main challenges: 1) lack of knowledge transfer; 2) trainings are too short; 3) refresher trainings are consistently needed.

Inputs: Nearly all of the CREATE cooperatives mentioned an improvement in farming inputs. Farmers know the advantage of using quality inputs. Almost half of the cooperatives struggle to buy inputs on time because sellers delay or the farmers lack the means to purchase inputs when they are needed. Key informants highlighted this late access as a key challenge facing farmers. Strong cooperatives purchase inputs collectively and subtract payment from ending production.

Pesticides are a key challenge for 6 of the EUCORD cooperatives not included in the 10 reporting challenges. They have trouble accessing good pesticides on time due to knowledge, availability, and means. Key informants echoed this concern, saying pesticides should be part of trainings on inputs.

Market: Before CREATE, farmers sold to the side (local) market and to intermediaries rather than a business. By having a guaranteed market that pays a premium, farmers are able to plan for the coming season, are willing to buy expensive inputs, and can leverage their contracts to access credit. Access to this market is the second most highly mentioned benefit after trainings/knowledge. Control cooperatives listed having a consistent market as a key challenge. However, during rainy seasons, some cooperatives still sell to the side market to avoid spoilage. Some members sell early to have the financial means to pay for household necessities. Selling to the side market eases transportation.

The 8 cooperatives that listed the market as a problem cited the delay in payments from ProDev. ProDev has taken measures to not experience similar cash flow problems in the future, but farmers have lost trust in ProDev as a buyer. Farmers also appear to attribute the dramatic increase in the price of maize to the project. This is dangerous as they are likely to blame the project when the price drops.

Post-harvest: Every cooperative talked about the improvement in post-harvest losses due to EUCORD's trainings. The most common complaint in post-harvest is that they do not have adequate space and facilities to store during the rainy season. This limitation leads to heavy losses. Key informants echoed the need for more post-harvest facilities.

Credit: Half of the cooperatives interviewed reported that they are able to access credit, while the other half said credit and loans were a challenge. Loans allow farmers to buy inputs on time, keep farmers from selling early to meet their basic needs, and aids with transportation costs. A couple of cooperatives explained that if they could access credit, they could purchase the production of cooperative members and even neighbors to sell to ProDev.

Some banks are hesitant to work with farmers, but irrigation and a market improve a cooperative's chances of accessing credit. One bank key informant explained that cooperatives that take both pre-planting and post-harvest loans have the highest repayment rates. Another informant said cooperatives that are able to get loans have almost twice the production as those that do not have access to loans. The best system they have found for repayment is to work directly with buyers like ProDev to receive payment for the loans from the buyer rather than the farmers.

Transportation: Two types of transportation problems were identified: getting crops from the fields to the storing and drying facilities, and getting production to ProDev. Roads are bad, fields are often far from drying and storing facilities, and transportation companies demand payment immediately even though farmers won't be paid for days or weeks. This causes spoilage and selling to side markets. ProDev can provide a fleet of trucks or transportation companies can be paid by ProDev.

Irrigation: In order to grow during the dry season, farmers need access to irrigation equipment. Three major problems limit irrigation: 1) land on hills, especially in Kayonza, 2) Irrigation equipment is expensive, 3) Many cooperatives have spread out land making irrigation difficult and more expensive.

Perception: Farmers want to view themselves as professionals who love what they do. External perception of farming will become more important for the future to draw in youth. Cooperatives also compare themselves to other cooperatives often with incorrect information. They believe that other cooperatives are receiving free items or are getting 10-12 tonnes/ha of maize.

Financial Management: Financial management ranges from simple record keeping to investment of cooperative money to develop the members. Some cooperatives still are not doing accurate record keeping. For others, record keeping has turned into the ability to plan family spending as a household. Many farmers have opened a bank account. Several of the strongest cooperatives use their money to invest in members, buy livestock, purchase inputs early, store extra production, and hire staff.

Cooperatives: The management training is highly valued by those receiving it. Membership is up and it is easier to motivate farmers to follow the trainings and rules of the cooperative. Cooperatives want to visit other cooperatives and learn from the most successful ones, while successful cooperatives want to share what they have learned.

Households: Farmers said that their living standard has increased due to the project and that they have been able to develop themselves. The following are the most commonly mentioned changes in EUCORD and RWARRI cooperatives: able to buy health insurance on time, buy livestock, can pay school fees, improved housing, eat healthier without malnutrition, and get solar electricity. One farmer reported that the project has "brought us out of poverty."

Food Security: Cooperatives report that they have more and healthier food for their families. Now, everyone in their household eats better, kids do not struggle with malnutrition sickness, and "even men eat porridge." Farmers said that they grow more and can store some for their families. By selling more of their production at a higher price, they are able to buy the food they cannot provide through farming. Three cooperatives said that getting enough food is harder in the dry season. Cooperatives that have had their land changed by the government report that they do not feel food secure.

Gender: Every cooperative including control group cooperatives claimed to have gender equality. This was mainly through more equal numbers in membership, management, and training attendance. Cooperatives in all three groups claimed that men and women receive the same benefits and do the same tasks. CREATE cooperatives mentioned increased voice for women, greater financial standing, access to money, equal knowledge, and empowerment. Now women have their own bank accounts and are part of the decision-making process around household spending. One woman reported that “There's nothing a man can do that I can't do. If a man isn't there, I can do the irrigation.” One key informant said women no longer say they have no money for their kids because their husband spent it. However, reported equality does not mean equity. Men tended to speak more than women including during the questions about gender. In the two separate-gender FGDs, the women were far less informed. Women were more burdened by the time for FGDs due to domestic tasks.

Success and Cumulative Impact: Cooperatives that do not work with CREATE wish to, membership in CREATE cooperatives is growing, and key informants want EUCORD to expand all speak to the project's success. When asked what constituted success for the project, many said that success was based on one of five things: 1) increased production and living standard, 2) having the equipment and facilities they need, 3) being able to solve key challenges such as post-harvest losses, loans, irrigation, and change of land, 4) loving what they do, 5) never going back to where they were before CREATE.

When comparing CREATE cooperatives to non-CREATE cooperatives, key informants report that CREATE cooperatives have better land preparation and timing, use the correct inputs, have higher production, lower post-harvest losses, more knowledge about crop rotation, better connections with financial institutions, and are more motivated to produce higher quantity and quality. Key informants within the value chain report they believe the project impact will continue because they have been integrated into the supply chain where both sides are incentivized to work together to solve problems.

ProDev, MINIMEX and BRALIRWA, report positive change as well. These companies have been able to increase the percent of their maize that is locally sourced, dampen the impacts of international price spikes and maize export bans, and decrease their dependence on the dollar.

Recommendations

- Provide a laminated sheet of key training takeaways and partner with GoR to create a refresher course. Provide longer record keeping sessions with follow up. Teach attendees how to teach other cooperative members. Encourage gender equity by teaching the importance of discussing saving, selling, and spending as a household as part of record keeping trainings.
- Coordinate with input sellers on timing and encourage cooperatives to buy inputs collectively.
- Collaborate with GoR on the predominant diseases and pests infecting the maize and make pesticide usage a main aspect of input training.
- EUCORD agronomists should explain the reasons for the maize price boom, prepare for the price drop, and clarify to farmers why payments were delayed but won't be in the future.
- Help farmers increase their storage and drying facilities, utilizing PASP discounted prices.
- Provide trainings on credit. Encourage taking both pre-planting and post-harvest loans. Consider cosigning on loans. Establish loan contracts where the buyer pays the bank directly.
- Coordinate with ProDev to provide transportation or pay for transport upon delivery.
- Expand CREATE's irrigation work with an emphasis on cooperatives in Kayonza.
- Use successful cooperatives as “demo plots.” Share the successes of cooperatives with strong investment. Help management teams create investment plans and train them attract youth.
- Encourage investment as a valid form of savings, but not to the point of having no liquid savings to buy inputs and cover costs between planting and getting paid for their production.
- Teach the difference between women being able to do all of the same tasks versus women carrying a similar amount of the weight in supporting the family.

Introduction

This report presents the main findings from a mid-term impact evaluation for the CREATE Project in Rwanda. The purpose of this report is to provide the project implementers with relevant and timely data on the opinions and experiences of multiple stakeholders within the project. Recommendations are provided in an effort to improve the impact of CREATE as well as future projects.

The overall objective of the CREATE Project is to increase food security and improve livelihoods of maize producers in Rwanda by developing the Rwanda maize sector and linking thousands of maize farmers to a guaranteed market. This is to be achieved through six sub-objectives: 1) Develop and strengthen producers' groups and/or cooperatives; 2) Train farmers in improved maize cultivation and post-harvest technologies; 3) Leverage short-term credit; 4) Establish long-term partnerships between producer groups, intermediaries, and agro-processors; 5) Develop marketing capacities and 6) Facilitate transport and other logistics. The project aims to help to create a sustainable source of income to the rural poor, as well as affordable food to the urban poor.

Rwandan Background

In terms of overall economic health and human development, Rwanda is one of the least developed countries. According to UNDP (2016), Rwanda's 2015 HDI score is 0.498, a ranking of 159 out of 188 countries, a measure that accounts for health, education, and standard of living. Adjusted for inequality, the HDI is an even lower 0.339 for 2015. This is a vast improvement over a score of 0.244 in 1990 and a 0.332 in 2000, but a small improvement from the 2010 score of 0.464 (UNDP, 2016). The GDP per capita of Rwanda is \$1900, placing it 208th out of 230 countries and the fertility rate remains high at an estimated 4.46 children born per woman in 2016 (CIA World Factbook, 2017).

Agriculture remains a key sector for the Rwandan economy. In 2012, 84% of women and 66% of men worked in agricultural (World Bank, 2017). In 2015, agriculture accounted for 33% of GDP, 70% of export revenue, and about 90% of national food needs (IPARRwanda, 2016). Increased productivity and government investment has helped to decrease poverty over the last decade. However, farmers still struggle to integrate into the global and national supply chain. Limited access to quality inputs, technology, and modern agricultural practices decrease crop production and make it harder for local farmers to compete with international alternatives. Under current conditions, Rwandan maize farmers cannot compete with Brazilian maize imports which are cheaper and often of higher quality. Furthermore, low entrepreneurial knowledge and skills limit the integration of small farmers into the value chain as they lack the ability to market, track, and manage their produce.

Coming out of the Rwandan genocide of 1994, Rwanda faced several key challenges in the agricultural sector. Female headed households were highly prevalent with a large portion of men killed or imprisoned due to the genocide. However, women lacked legal and practical rights to agricultural land and means of production such as credit, purchasing power, and organization. The genocide had also led to a dramatic need for redistribution of land that could serve as a spark for future conflict. The Land Tenure Regularization (LTR) program of 2007 sought to redistribute land to poor farmer cooperatives and establish processes for official land transfers that would empower women and preserve peace. In some cases, the government retains ownership of land and can redistribute it if the cooperative underperforms.



GoR has several programs designed to help farmers build their capacity and increase Rwandan food security. Subsidies for irrigation equipment exist as well as subsidies to local seed and fertilizer sellers in order to bring down the cost of inputs for farmers. Interventions focus on the growth of the poorest farmers of Rwanda as well as gender equity. The Ministry of Agriculture and Animal Resources (2010) created an Agriculture Gender Strategy in 2010 to improve gender equality in the agricultural sector through institutionalized “gender responsive programming (planning and budgeting), implementation, monitoring and reporting systems” (p. 32). By integrating gender indicators into all national and international development programs, the government hopes to decrease gender inequality through all projects rather than female-specific, targeted projects.

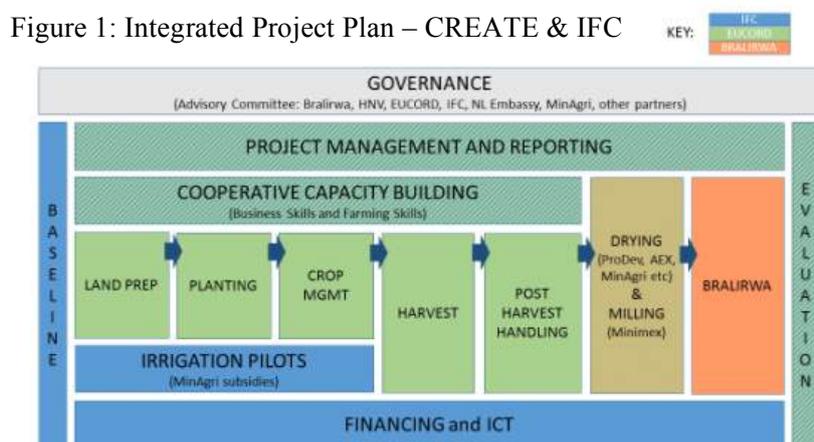
Project Background

CREATE Rwanda began during the second quarter of 2014 and is scheduled to be completed June 2018. It is paralleled by similar projects in Ethiopia and Sierra Leone, starting at the same time. The project is financed by Heineken as part of their efforts to locally source the inputs for their subsidiaries, including BRALIRWA in Rwanda, and by Minibuza as part of their international development work to build food security in Africa. EUCORD serves as the implementer of this project and provides capacity building, inputs, and linkages to local markets.

CREATE seeks to fully integrate rural Rwandan farmers into the local maize supply chain as well as build their capacity to provide for their own food and income needs. This is done through direct intervention and support for farmer cooperatives in the Eastern Province. Support starts with the purchase of quality inputs and follows the farmers through the agricultural process including post-harvest to sale of produce to ProDev. Interventions can be broken down into four categories: cooperative capacity building, irrigation assistance, advanced agricultural practices trainings, and input purchasing support. Cooperative capacity building focuses on management, record keeping, and

marketing skills. Irrigation assistance provides financial and technical support for farmers to integrate quality water management and avoid crop loss due to drought. Trainings, field days, and demonstrations introduce farmers to advanced agricultural practices including planting in lanes, single cropping, and using fertilizers, seeds, and pesticides. Purchasing support goes beyond financial assistance to include logistical help tracking where and when inputs will be available.

EUCORD partners with additional NGOs and agencies to provide complementary services based on the additional needs of farmers observed early in the project implementation. Parallel services such as farm demos and trainings are provided by local NGO RWARRI, which works under the funding of WFP/FAMA. A partnership with IFC was established to meet the challenges EUCORD identified within the value chain including low capacity within coops and the need for climate resilient practices. This partnership added three sub-objectives to the project: 7) Enhancing the leadership and management of cooperatives; 8) Improving climate resilience with the introduction of small-scale irrigation technologies; and 9) Supporting cooperatives to gain access to finance. USAID’s Private Sector Driven Agriculture Growth (PSDAG) is also working with CREATE coops to test post-harvest techniques. Figure 1 shows integrated project plan including the role of EUCORD and IFC.



From CREATE Annual Report

During 2016, CREATE supported 10,884 households and delivered 3,157 tons of maize to the maize mill in partnership with RWARRI. Both quantities exceeded EUCORD’s initial targets for the year, including the expanded targets after the addition of RWARRI coops. Additionally, CREATE exceeded its 2016 targets for number of workshop/field days, number of demonstrations, number of farmer households which have received credit for productive purposes, MT of maize sold to industries and available for household consumption or local food market, number of long-term partnerships established, number of cooperative leaders trained, and number of collection points operational.

In the last year of the project, EUCORD aims to continue to increase crop productivity and income growth through a continuation of services already provided as well as integration of irrigation, an accelerated process of signing contracts with ProDev, increased access to credit, stronger communication and record keeping, and greater participation of women.

Objectives and Scope

Objective

The primary objective of this report is to provide a mid-term impact evaluation of the CREATE Project in Rwanda and to provide EUCORD and its partners with information, findings, and recommendations that can be used to improve the final year of implementation as well as similar projects in the future.

Stakeholders interviewed and questions asked were designed to analyze the project's effect on farmer's productivity, living standards, and ability to meet household needs as well as narrowing in on the following project objectives, including those from the IFC partnership:

- Develop and strengthen producers' groups and/or cooperatives, especially management teams;
- Train farmers in improved maize cultivation and post-harvest technologies;
- Leverage short-term credit and support cooperatives to gain access to finance;
- Establish long-term partnerships between producer groups, intermediaries, and agro-processors;
- Develop marketing capacities;
- Facilitate transport and other logistics;
- Create a sustainable source of income to the rural poor, as well as affordable food to the urban poor; and
- Improve climate resilience with the introduction of small-scale irrigation technologies.

Scope

CREATE works in the districts of Rwamagana, Kayonza, and Ngoma (RWARRI only in the last). Within these districts, EUCORD currently works directly with 26 cooperatives representing over 8500 members and over 2,400 ha of land in addition to the 21 cooperatives served by RWARRI representing over 3600 members and almost 1,400 ha.

EUCORD operates in a network of NGO, private sector, and government projects that provide parallel and complementary services including WFP, USAID, IFC, RWARRI, JADF, Rabobank, ProDev, and BRALIRWA/Heineken.

Approach and Methodology

This evaluation was designed to provide a multi-faceted view of the impacts and strengths of the project thus far and to determine remaining challenges and gaps to be addressed in the final year of the project.

Cooperative Focus Group Discussions

In order to collect the widest sample of farmer experiences and challenges, focus group discussions (FGDs) were scheduled with 25 EUCORD cooperatives (all EUCORD cooperatives besides COOPAGRIKA), 4 RWARRI cooperatives, and 4 control group cooperatives that work with neither RWARRI nor EUCORD. Due to the limited time available for the survey and the difficulty of contacting and incentivizing control cooperatives, interviewing EUCORD cooperatives was prioritized. Control cooperatives were organized by EUCORD's project coordinator and the district agronomists based on meeting the qualifications EUCORD uses in choosing cooperatives for the project, including rights to the land on which they farm, organized enough to utilize project assistance, and membership with mixed gender. These cooperatives are possible additions to the project and the impact research doubled as information gathering on whether the cooperatives should be added.

The FGDs were piloted with a large group of women (14) followed by a larger group of men (17) with one cooperative followed by a single mixed gender FGD of 4 women and 8 men. Participants were chosen based on availability. It was determined that separating men and women put far more inconvenience on the farmers who had to wait for the first group to finish without working and disadvantaged the data more than the gendered data added benefits. In the mixed gender FGD, both genders participated, building on each other's knowledge. In the single gender FGDs, it was difficult to rationalize differences between reported impacts and challenges, whereas in the mixed gender FGD, members provided information in areas where they were most knowledgeable and presented counter opinions or experiences.

Based on the pilot FGDs, 5 men and 5 women were requested to participate from each cooperative and chosen by the cooperative president. Though this sampling method of participants was not ideal, it was necessary given the pre-interview planning time available and it respected cooperative member availability. In practice, groups ranged in size from five to fifteen people depending on member availability. Additionally, as the "mzungu" or white person, I often attracted additional participants beyond the scheduled ones. Gender ratio varied slightly, but remained near 50:50 for each interview and averaged about 50:50 cumulatively. Most groups also had a mix of management team members and non-management members. This was helpful for providing both knowledgeable perspectives and representative experiences.

The pilot focus group questions and updated questions can be found in Annex 1 and 2. Questions were chosen based on the project objectives, 2016 EUCORD Annual Report, and Rwandan agriculture research. The baseline survey questions were avoided so as to not overlap the official end line evaluation, but instead provide something additional. The main change between the original questions and the updated questions was the order of questions to better draw out impacts, benefits, and challenges. Once participants started talking about challenges, they didn't want to talk about anything else, so during the early questions, if participants started talking about exclusively challenges, they were encouraged to focus on changes with the promise that we would have a whole section for challenges. After the discussion of changes, participants were asked which trainings were the most helpful based on the four most common broad categories of trainings mentioned by participants. They were asked to go to one of four corners of the room based on their individual vote and votes were tallied as gendered data. A discussion of challenges followed. Next, rapid rural appraisal (RRA) style questions with ground nuts allowed everyone to participate and visualize changes in production, spending, saving, and food security. FGDs ended by asking about participant's opinion of the most helpful aspect of the project and their definition of success.

FGDs were conducted by one evaluator and one translator. The translator was chosen based on her experience doing interviews of Rwandan households in the eastern province and her reliability for direct translation. The translator's strengths and weaknesses overlapped those of the evaluator in many ways, such as a knowledge of the process but not of farmer experience. However, this kept limitations of the study on the evaluator's bias and did not add as great of a risk of translator bias.

FGDs began with an introduction by the local agronomist (EUCORD, RWARRI, or government) in which the agronomist introduced the enumerators, explained briefly the purpose of the interview, that participants should not try to exaggerate but share the truth, and typically explained that the participants should not expect to get any donations from the enumerators. Then informed consent was received before the focus group questions were asked (informed consent speech can be found in Annex 3). Participants were provided ground nuts as part of the activities but were provided no other incentives or benefits besides the chance to have their opinions and challenges expressed to the project staff and donors (or in the case of control groups, the possibility of becoming a EUCORD cooperative, though it was made clear that no specific answers made that more or less likely).



Key Informant Interviews (KIIs)

Key informants were chosen from EUCORD's partners, other actors in the maize value chain, and organizations offering parallel services. Formal interviews and informal interviews sought to understand three main areas: the impact of the project, the challenges faced by farmers, and what works versus what doesn't when undertaking such a project.

Formal face-to-face KIIs were conducted with the following entities: WFP FAMA, RWARRI, ProDev, MINIMEX, banks, PASP, an intermediary maize trader, district agronomists, BRALIRWA, and EUCORD agronomists. In formal interviews, the main interviewees were project managers and directors of the organization or business. The purpose of most of these KIIs was to triangulate the information gathered from the FGD and to gain additional perspectives on the project impact. Some

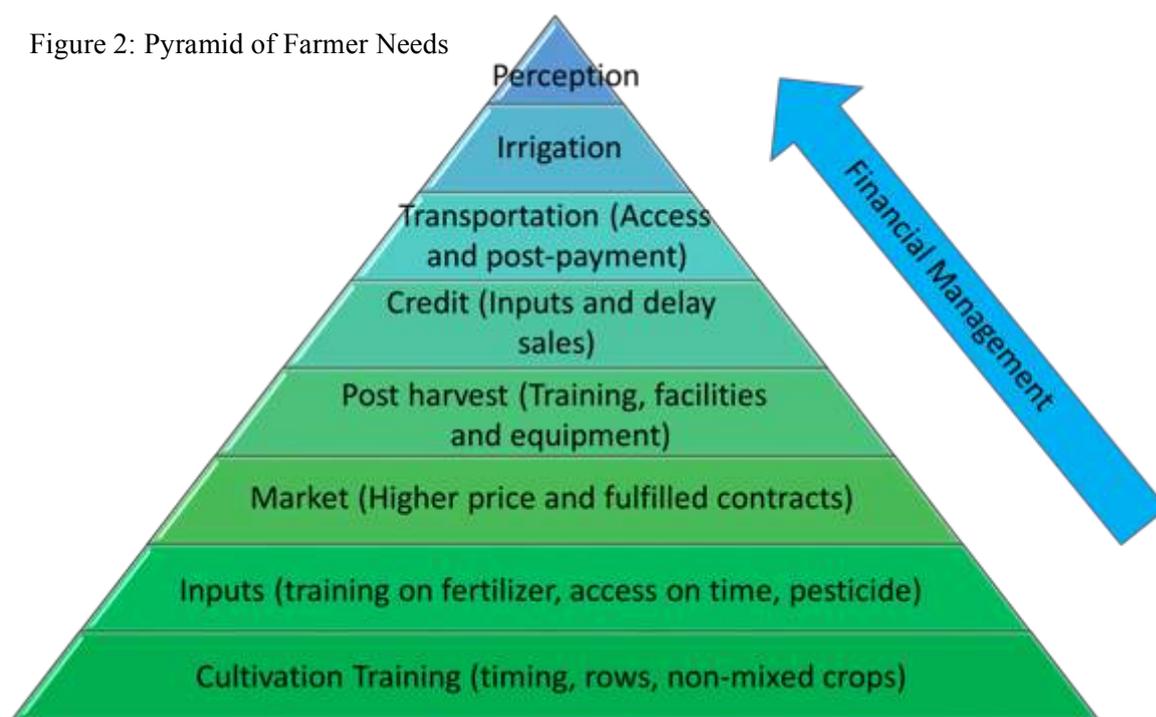
KIIs, such as banks and the intermediary maize trader sought to understand the value chain outside of the project and to evaluate how external actors effect the project's success.

Informal KIIs were conducted with organization representatives at the Annual Kigali Agricultural Expo and business representatives that visited the EUCORD office to present their products or approach. These interviews included Tubura, Holland Greentech, WFP P4P, IFC, a local youth empowerment in agriculture project, the World Bank's irrigation project, and other Dutch NGOs working in agriculture. These short interviews focused on the biggest challenges farmers face and the interventions used by that entity's project. The purpose of these KIIs was to understand the approach and perspective of other actors working in parallel to CREATE.

Findings and Recommendations

Throughout the FGDs farmers shared many common changes and challenges. Figure 2 provides a framework in which to process the data and understand many of the overarching themes from the research. The hierarchy provided is based on two different factors: 1) In many ways the higher levels rely on the levels below them, especially the level directly below. For example, having a market is not effective for a cooperative that does not have the inputs to grow the quantity and quality desired by the market and those inputs are useful to farmers only after they have been trained to cultivate effectively. 2) Based on the responses from FGD, the project has been most effective in the lower tiers and is working on the higher tiers, while the government and other NGOs are also working to provide the lowest tiers. In this way, the pyramid has both logic and chronology to it.

Figure 2: Pyramid of Farmer Needs



Cultivation training covers the basics of modern farming techniques, including planting in rows with the correct measurements, planting and harvesting at the right time, using good seeds and fertilizer, and not intercropping. Inputs include trainings on how to mix the correct fertilizers using compost and chemicals, assistance accessing and paying for inputs on time, and the correct usage of pesticides. Connection to a market (ProDev) means that farmers receive a higher price and are guaranteed a buyer, which can help them get credit and plan for the season to come. Post-harvest trainings aid farmers in lowering post-harvest losses, increase the quality of product that reaches ProDev, and provide food security for the family by allowing them to store some of their produce for household use. These trainings are supplemented by facilities and equipment that provide those same services as well as saving labor hours and money. Access to credit allows farmers to get loans either pre-planting in order to buy inputs, post-harvest to pay for transportation and hold them over until ProDev pays them, or both kinds of loans. Transportation addresses whether farmers are able to get their crops from the field to their post-harvest equipment and facilities and whether they are able to get their production to ProDev when it is ready. In the Eastern Province, irrigation determines whether farmers can utilize a third season of growing during the dry season and can aid in water management during the rainy season. Perception relates to farmers' view of themselves as professionals, cooperatives' view of themselves as a team, and the view of society that farming is a legitimate and profitable profession. The best cooperatives love what they do and the continued success of farming in Rwanda relies on youth and adults valuing modern farming. Financial management sits outside the pyramid because it is present at all levels and changes as a cooperative advances from record keeping to loan

management, to investment in the cooperative. Each of the above tiers will be discussed further in the sections below.

EUCORD and RWARRI cooperatives both report progress in the first four tiers of the pyramid (cultivation, inputs, market, and post-harvest) as well as financial management. Half report progress in credit. The control group also reports progress on cultivation, inputs, and post-harvest. Table 1 shows the number of cooperatives in each of the three groups (EUCORD, RWARRI, and the control group) that specifically mentioned progress or success in each tier as well as the number that mentioned challenges in that tier. Some cooperatives mentioned both progress and remaining challenges in a single area and are coded for both. Cooperatives placement in the table is based on coding their responses, not based on asking them to rank themselves on the chart.

Table 1: Cooperative Changes and Challenges within the Project Categories

	Positive Change/Success			Challenge		
	EUCORD (25)	RWARRI (4)	Control (4)	EUCORD (25)	RWARRI (4)	Control (4)
Cultivation	24	4	4	7	0	1
Inputs	23	3	3	10 (6)	1	3
Market	22	4	0	8	3	4
Post-Harvest	25	4	3	19	3	3
Credit	12	3	1	12	2	3
Transportation	2	1	0	13	3	1
Irrigation	5	0	1	19	1	4
Perception	6	3	1	3	0	0
Financial Management	18	4	1	12	0	2

Note: the number in parentheses after cooperatives with challenges in inputs represents the number of cooperatives that expressed a challenge with pesticides but no other inputs. They were not included in the figure outside the parentheses.

The numbers in Table 1 show that the project has made great progress in the lower tiers and has been more effective than government programs at connecting farmers to market and has had comparatively more success lowering the challenges of cooperatives in accessing and using inputs. Post-harvest and credit mark a transition point in the project. In post-harvest, all three groups stated both significant progress and key challenges, most of which involved having the space and equipment to store and process their production. In credit, half of the EUCORD and RWARRI cooperatives reported being able to access credit while the other half said they faced difficulty or were unable to access credit. Transportation and irrigation remain key aspects for the project moving forward in order to reach production goals. Perception remains on the horizon for most cooperatives, but presents an opportunity for EUCORD to increase the impact and longevity of the project.

Cultivation and production

Farmers in cooperatives participating in CREATE speak of improved farming techniques, higher production, access to machinery, and visible changes in their fields. They discuss the increased income they now achieve due to higher quantity and quality of maize. Many have switched crops in order to grow maize and say that while they were initially upset that the government made them switch to maize, now they would fight to keep it if the government told them to switch again. As one farmer put it, “Maize is seen as a way to develop ourselves.” Farmers listed trainings, specifically

trainings about fertilizer use, as the most helpful aspects of the project. As shown in Table 1, 24 of the 25 EUCORD cooperatives interviewed mentioned cultivation as an area of progress and success.

Farmers also reported high appreciation for and faith in the EUCORD agronomists. Unlike other projects some of the cooperatives have worked with, I was told again and again that the EUCORD agronomists always follow up, that they visit their fields, that they are available for advice at any time. This attention has built the trust of farmers in EUCORD as a whole as well as motivated them to apply the learning from trainings and complete farming tasks on time. The agronomists also help the farmers access inputs, especially when determining which pesticides to purchase. As one of my KII said, when an organization wants to work with farmers in Kayonza, they go to EUCORD first because their agronomists know the cooperatives, they know the farmers, and they have the on the ground knowledge.

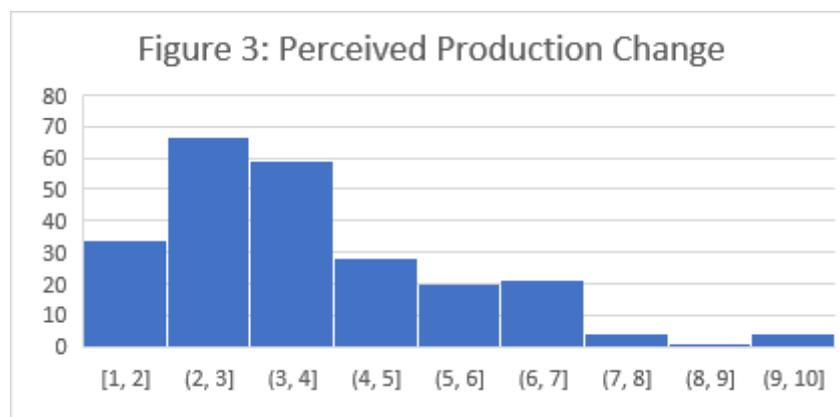
Several cooperatives also mentioned the benefit they have gained through CREATE in being able to grow in three seasons (including the dry season) instead of two. Many grow vegetables for the family, increasing their food security and selling excess to the local market, while others grow a soya cash crop to bring in extra income for the household.

Through cultivation training, farmers have learned the correct timing and measurements for farming. They have learned how to mix and use fertilizers and good seeds. Farmers in almost every cooperative reported no longer intercropping and that they now grow in lanes, all of which have increased production. Farmers request further trainings on cultivation as refreshers each year and so that members who were unable to attend can learn as well. Many farmers say that they will never go back to the old ways of planting “anyhow” implying a high level of sustainability for many of the trainings.

Every FGD mentioned an increase in production. This rise was attributed in every case to trainings on modern farming techniques. Specifically, not intercropping, using fertilizer and quality seeds, cultivating in lanes, and cultivating at the right time were cited as the reasons for increased production. The first of the RRA questions asked participants to place in one hand nuts to represent the quantity they used to produce and in their other to represent their production now. Data were recorded for the factor by which the new production is higher than the old. For example, a 2 means that a farmer perceives that they produce twice as much now and so there were approximately twice as many nuts in their new hand compared to their old. This should not be taken as an accurate measure of increase, but is valuable in showing the perceived impact of the project by participants.



In total, the average perceived production increase for EUCORD cooperatives was 4.08 with a standard deviation of 1.82 (omitting two outliers out of 240 responses). This means that on average farmers believe that their production has quadrupled. Two cooperatives did not provide usable data for these calculations because of extraneous circumstances that meant their production increased with the project and then decreased significantly due to being moved to different land. Figure 3 below shows the frequency of each response.



RWARRI cooperatives had an average of 4.9 and a standard deviation of 2.4 (omitting two outliers out of 40). Control group cooperatives had an average of 3.5 and a standard deviation of 1.7 (omitting no outliers out of 36). The control group cited government trainings on using fertilizer, not intercropping, and cultivating in lanes as the reason for their production increase. As control group farmers were still receiving training yet reported consistently lower production increases, it is possible to say that the limited data imply cooperatives benefit more from EUCORD trainings and support than government trainings and support.

Some farmers still struggle with obtaining the quality of maize required by ProDev. Some lack the post-harvest skills or equipment necessary to preserve quality as will be discussed later. Others do not process all of their production at the same time and so lose quality between the first batch and the last. Another problem reported was lack of the means to implement what they have learned. Some farmers also report that not enough of the knowledge was transferred from the few individuals trained to the rest of the cooperative.

Recommendations:

- Provide a laminated “cheat sheet” of key takeaways and cultivation measurements (including fertilizer and common pesticides) for each cooperative. This reference guide will help when EUCORD is no longer providing cultivation trainings and can be shared with new members.
- Farmers want to continue increasing production, but have already completed the “low hanging fruit” or easy transitions. Continuing to increase productivity will be more difficult and farmers need to be made aware of that in a way that neither discourages them from trying, nor discourages them when no easy solution is available.



Non-CREATE cooperative field with intercropping

Trainings

Trainings and knowledge were consistently ranked as the most helpful aspects of the project by participants. They listed five different kinds of trainings: modern cultivating and fertilizing, post-harvest handling and processing, when and where to sell, record keeping, and cooperative management. Not all of the cooperatives had received record keeping trainings and fewer mentioned management training in connection with EUCORD (meaning it was not a voting option). Table 2 below shows the results of asking EUCORD cooperative FGD participants to place themselves around the room to vote for which training was personally most helpful. Many cooperatives stated that all of the trainings were helpful before they were willing to choose which were most helpful to them personally. In the table, the percents are based on the share of men that picked that training and the share of women. The actual number of men and women in each category is provided in parentheses.

Table 2: Most Helpful Trainings by Gender

	Cultivating/Fertilizing	Post-Harvest	When/Where to Sell	Record Keeping	Management
Men	47% (69)	23% (33)	12% (17)	16% (24)	2% (3)
Women	58% (53)	24% (22)	10% (9)	9% (8)	0% (0)

The table above does not include data for four different cooperatives in which the participants did not know enough about the trainings to give reliable answers. They instead spoke of the benefits of

learning how to grow maize more generally. Many of the cooperatives had not been trained in record keeping or felt that they needed more before they could rate it as the most useful. Management was only an option when cooperatives specifically brought it up as useful, since only the management receives this training and only about half of the cooperatives have been offered such training. In both of the cooperatives in which I interviewed men and women separately, the women were unable to participate in the activity because they had not attended any of the trainings or didn't know from which kind of training the knowledge that was shared with them came.

Cultivation training was by far the most valued training category, especially so amongst women. Record keeping was typically chosen by presidents, vice presidents, and accountants of the cooperative. Interestingly, the cooperatives where management was added to the list were split as to the level of effective management and application of that learning.

During the second half of the research period, participants were asked if they preferred trainings or demos. The majority of cooperatives reported that they prefer demos because it doesn't require the ability to read (Kayonza has a 67% literacy rate and Rwamagana has a 71% literacy rate), it is easier to remember what you see, and the learning is proof in itself. As one cooperative said, the best trainings mix hearing it and seeing it. One key informant echoed this saying that farmers can be told, but not believe their training, but they will believe the results that they see.

Three main challenges within trainings were presented in the FGD. 1) Trainings are not always being effectively passed on from those that attend trainings to the rest of the cooperative and thus cooperatives want more members to be trained. 2) Attendees feel that trainings are too short, especially record keeping trainings which require a lot of math and technical knowledge. 3) Refresher trainings are consistently needed to train more/new farmers and to remind farmers of previous learning.

When asked what trainings would be useful in the future, farmers listed the following topics (the number of cooperatives that listed each are in the parentheses after each topic): record keeping (16), more members trained on the same topics (10), cultivation refresher (7), cooperative management (6), what successful cooperatives are doing/working with other cooperatives (5), using and fixing machines (5), increasing production (4), post-harvest: storing, processing, and drying (4), irrigation and water management (3), using their own seeds and fertilizer (3), credit and loans (2), marketing and selling (2), benefits of being in a cooperative (2), doing their own projects (1), loving what they do (1), knowing what maize to take to market and which to keep (1), pesticide (1), using computers (1), working with a vision (1).

Recommendations:

- Teach training attendees not only the information, but how to teach it to their cooperatives as knowledge transfer is not always effective.
- Connect cooperative leaders with government trainings so more members can attend trainings and refreshers will still be possible after CREATE is complete
- Partner with the government to create a refresher specific course meant for farmers who have attended a training before but need a reminder on preparing the land, measurements, fertilizer, etc.
- Provide longer record keeping sessions with the level of follow up that cooperatives value so highly in cultivation training supported by agronomist visits

Inputs

Nearly all of the EUCORD cooperatives (23 out of 25) mentioned an improvement in farming inputs. Farmers know the advantage of using inputs such as quality seeds, fertilizer, and pesticides and view the expense as an investment. Those that use the advanced seeds and improved fertilizer attribute

much of their increased production to doing so. More than half of the cooperatives reported that they are now able to get inputs on time and can thereby plant and harvest on time. Several cooperatives reported that either the EUCORD or government agronomist connects them to input sellers and/or tells them when and where inputs are available each season.

Almost half of the cooperatives (10 out of 25) report that they struggle to buy inputs on time either because sellers delay or the farmers do not have the means to purchase inputs when they are needed and will either wait or not buy inputs at all. Some farmers expressed that their ability to buy inputs on time is directly connected to whether they can get loans. Struggling cooperatives report that if they had the means and access to inputs on time, they could increase production and cultivate on time. Other cooperatives are prepared and still cannot find inputs when they need them. Key informants highlighted this late access as a key challenge facing farmers in the Eastern Province.

Pesticides are a key challenge for 6 of the EUCORD cooperatives. They have trouble accessing good pesticides on time due to knowledge, availability, and means. These cooperatives are afraid that they are going to lose all of their production to pests and sickness and will be unable to pay back loans or provide for their families. One cooperative reported that the pests are so bad they are even getting on the animals and people. Some of the sicknesses were mentioned multiple times and are reportedly a problem across East Africa. Key informants also echoed this concern, saying pesticides should be part of the trainings on inputs.

One of the main differences I noticed between strong cooperatives and weak ones in relation to inputs is that the strong cooperatives purchase inputs as a cooperative and distribute amongst the individual farmers, sometimes waiting to be paid back for inputs until they have collected and sold production at the end of the season. Weak cooperatives buy inputs as individuals based on each farmer's means at the time. The strongest cooperatives buy seeds and fertilizer a month ahead of time.

Few of the cooperatives realize that they are receiving inputs at a discounted price due to the government and may struggle if they do not prepare for increasing prices in the future. Other organizations, such as Tubura, help farmers to access quality inputs on time. Input NGOs that work with farmers in Kayonza remark that selling to EUCORD supported cooperatives is easy because the farmers understand the benefits they stand to receive from spending money on improved inputs.

Machines were also included in inputs during FGDs. Those cooperatives that had access to machinery reported that it helped significantly with reducing losses as well as saving time, labor, and money. The main complaints around machines were the desire to own rather than rent the equipment or to get it for free rather than having to pay a part or whole of the cost. These cooperatives believe that other cooperatives receive machinery for free and think they should receive these gifts as well.

Looking to the future, cooperatives would like to learn how to harvest their own seeds and make their own fertilizer. Some cooperatives even aspire to be fertilizer and seed sellers.

Recommendations:

- If no EUCORD cooperatives are receiving free machines, but instead must aid in the purchase, this should be made clear to all of them so that cooperatives don't feel there is inequality. If cooperatives must reach certain criteria to receive machines, they would likely strive for those goals if they knew it might result in discounted or free access to machinery. Explaining distribution will increase morale and decrease discouragement.
- Coordinate with Tubura and other input sellers to make sure every cooperative knows when and where to purchase quality inputs and can get them on time.
- Connect farmers to credit for input loans (discussed more below).
- Encourage cooperatives to buy inputs as a cooperative and highlight the successes of cooperatives that buy collectively and then subtract the cost of inputs from the final

production. This stands to motivate cooperatives and fulfill their desire to know what successful cooperatives are doing.

- Collaborate with the government around the predominant sicknesses and pests infecting the maize. If this is a country or province-wide problem, having the correct pesticides will be an issue for everyone.
- Make pesticide usage a main aspect of input training along with seeds and fertilizer.

Market

Before CREATE, farmers sold to the side (local) market and to intermediaries that came to the cooperative to buy their production rather than to a business in any maize supply chain. Cooperatives report that these side traders paid lower than market value for their production and that some used incorrect scales. ProDev is the preferred buyer of farmers not only for the premium they receive but also the higher moisture content that ProDev accepts. When farmers are asked what aspect of the project is most helpful, access to this market is the second most highly mentioned after trainings/knowledge. They say that their neighbors are jealous of their market and the control cooperatives listed having a consistent market as a key challenge.

Having a guaranteed market is very valuable to farmers. Not only does it allow them to plan for the coming season and gives them motivation as well as a higher price, but by having a contract with ProDev, cooperatives are able to access credit and get loans. Cooperatives that are able to leverage their contract into credit are able to get inputs on time, buy higher quality inputs, and meet their basic needs between harvests.

By selling their combined production to ProDev, cooperatives also receive the added benefit that in bringing their production together to take to ProDev, they are forced to work together as a team rather than as individual farmers. The cooperatives that still struggle to sell to ProDev have the lowest levels of cooperation between members, though it is unclear which causes which or if it is a cycle. Farmers also gain selling power when they do not have to accept the price of intermediaries but instead gather their production together and make conscious choices for selling.

Selling to the side market has not been eliminated entirely. During rainy seasons, some cooperatives still sell to the side market because they can sell it faster before it spoils. Without adequate storage and drying facilities, they cannot wait until the moisture content reaches ProDev's standards. Cooperatives that cannot achieve the quality ProDev demands are forced to sell to the side market which means that low-quality maize is being sold in the local markets for human and animal consumption. Several cooperatives or their individual members are forced to sell to intermediaries that visit during harvest because they need the money to carry them over to the end of the post-harvest season. One cooperative pointed out that harvest time is also school fee time and/or health insurance payment time, which makes farmers very vulnerable to selling early to have means. A final cause of selling to the side market is ease of transportation. Cooperatives that don't have money to pay for transportation are willing to sacrifice higher revenue in order to get their production to market at all before it spoils.

Some farmers claimed that occasionally the side market offers them more for their production than ProDev, but that they cannot sell for the higher price because they are locked into their contract. It is possible that this is because the farmers are comparing prices on different days and in a market with fluctuating prices to the extent of the recent maize market, every day makes a difference. It is also possible that the farmers did not have accurate information or that the intermediaries had the ability to process and store the maize for higher prices later in the cycle. The last possibility is that occasionally during the maize price boom, ProDev was unable to meet the premium price.

The 8 cooperatives that listed the market as a problem cited the delay in payments from ProDev. Farmers told me that they were paid as late as a month after delivery despite the contract promising them payment after three days. Not receiving payment caused serious problems for farmers who could

not pay their debts to the bank and cover basic needs. The reason for this delay was the dramatic increase in the market price which led to cash flow problems for ProDev. ProDev has set up cash systems to prevent this problem in the future, but farmers know neither the reason they were paid late, nor that the problem has been dealt with. As one key informant told me, at the beginning of the project, the farmers had to earn the trust of the buyer, now the buyer needs to earn back the trust of the farmer. Farmers told me directly that if these problems were not solved, they would not sell to ProDev.

The increase in maize prices has allowed farmers and cooperatives to improve themselves, a fact they are very proud of. However, farmers appear to attribute the dramatic increase in the price of maize to the project. This is dangerous since they are not just considering the increase from intermediary prices to ProDev's premium rate, they are also considering the rise in international prices from around 150Rwf/kg to 350Rwf/kg. The danger comes when the international market price drops as it is expected to do. Farmers need to be made aware of how the prices are expected to change so that they can plan for it and neither blame nor credit the project for market prices.

For this project to remain sustainable after CREATE ends, the linkages between ProDev, MINIMEX, and farmers need to be strong. The head of MINIMEX has expressed interest in visiting the field and being more involved in the project. High level buy-in increases the chance that stakeholders will continue to engage in the project and more importantly that there will be communication between the farmers and buyers when the EUCORD agronomists are no longer around to serve as a conduit. Farmers rely heavily on the agronomists and successful withdrawal will require establishing connections that fill those same roles. I foresee RWARRI cooperatives having longer lasting change as RWARRI is a local NGO and will likely continue providing support however minor. EUCORD should attempt to create these safety nets for their cooperatives before the end of the project.

Recommendations:

- EUCORD agronomists should attempt to explain the reasons for the maize price boom and prepare farmers for the likely decrease in prices in the coming seasons.
- With the help of the EUCORD agronomists, ProDev should clarify to farmers why payments were delayed and what steps have been taken to prevent cash flow problems in the future.
- Develop relationships between cooperative leaders and champions within ProDev, MINIMEX, Tubura, the government, and other local NGOs.
- With the help of local NGOs or government, EUCORD could work on the creation of communications systems that allow farmers to get up to date market price information.
- Focus project efforts and resources on teaching cooperatives how to leverage buyer contracts to access credit (discussed more below).

Post-harvest

Every cooperative talked about the improvement in the quality of their maize and the dramatic decrease in post-harvest losses due to EUCORD's trainings on post-harvest drying, storing, and handling. These trainings were also the second most valued of the training topics. In addition to the trainings, farmers that received post-harvest equipment expressed thanks for the time, money, and losses, the machines save. Farmers explained that they used to spread their harvest on the ground and use their teeth to determine the moisture content of the maize. Some still do not have the machines and facilities to process all of their maize correctly, but all report an improvement.



Farmers report that the training that they receive on storing allows them to save maize for household consumption. Many farmers said that they used to believe that maize had to be grilled right away or it would spoil or that they applied heavy levels of pesticide to their maize to keep it “fresh” but that this was bad for their family’s health. Now, farmers report that everyone in their household eats better, that kids do not struggle with malnutrition sickness, and that “even men eat porridge.” This last statement was given in several cooperatives.

One cooperative has utilized their post-harvest knowledge and new storage facilities in order to store maize for every household. In this way, the cooperative ensures that every household has enough to eat and the maize is not sold to the market for short term gains. The maize stays in good quality until the end of the next season.

Post-harvest and credit are the tipping points in the project at the time of the FGDs. While all cooperatives expressed improvement, 19 of the 25 cooperatives reported significant challenges within post-harvest. The most common complaint is that they do not have adequate space and facilities to store their production during the rainy season. This limitation leads to heavy losses. Farmers are thankful for what they have received but say that it is not enough to cover their increased production from cultivation training. Additionally, some cooperatives report that it is very difficult for them to utilize their machinery and facilities because they are so far from the fields and the cooperative has little to no ability to transport their production to the machines and facilities.

RWARRI cooperatives in Ngoma had an additional struggle last year as the government required them to keep production a minimum amount of time in hopes of increasing food security. Instead, this led to post-harvest losses.

Many cooperatives report that they now know the quality of the maize ProDev expects and are able to deliver the best quality. A few cooperatives reported the opposite, that they are asked at the market what tier of quality they have and do not know what the difference is.

Key informants echoed the need for more post-harvest facilities as a key challenge. Drying and storing capacity is essential to protect maize quality. Maintaining high quality doesn't only improve farmer income and ProDev's quantity, but also keeps low quality maize out of the local markets. They also expressed the importance of cost sharing rather than free equipment. Free equipment distorts the market, but without any support, cooperatives cannot afford equipment, nor can they put training into action. Ideally, these subsidies can be decreased over time until they are no longer needed.

As post-harvest improves, I foresee a problem arising eventually between the interests of the farmers and ProDev as to the level of post-harvest storage capacity the farmers reach. Farmers are already talking about the desire to store their production safely until the market prices rises and some are talking about moving up the value chain and doing some of the processing themselves. Right now, storing production decreases the quality and harms both farmers and ProDev. It is in ProDev's interest for farmers to sell them the maize the moment it has been dried enough to be accepted and processed (18% moisture content). However, if farmers reach the levels of post-harvest processing and storing they desire, they will be able to safely store their production for higher prices. As things are now, farmers should be made aware of the overall negative impact on them of trying to wait for higher prices. In the future, EUCORD may have to decide what stance to take on these competing interests.

Recommendations:

- Help farmers increase their storage and drying facilities and aid in their access of drying tents.
- PASP offers discounted prices on machines and facilities for post-harvest (these programs are set to end March 2019). EUCORD should connect farmers with these programs and help them get credit or savings to purchase additional resources. The additional sales they will receive from the decreased losses will cover the costs and help BRALIRWA reach their targets.
- Transportation (discussed below) should be made a part of post-harvest concerns and addressed as a way to decrease post-harvest losses.
- Train farmers on post-harvest equipment options to motivate them to invest in their own machinery and equipment.

Credit

Half of the cooperatives interviewed reported that they are able to access credit in order to get loans; the other half said credit and loans were a challenge and that they were either not able to get loans or did not trust themselves to be able to pay them back with the high interest rates available. Some cooperatives report that EUCORD has helped them access credit while others report that they have not tried to get loans and would like training on that.

As discussed above, loans allow farmers to buy inputs on time, which allows them to cultivate and harvest on time. Loans keep farmers from selling early to meet their basic needs. Transportation to ProDev can be covered with loans and without them some farmers are forced to sell to whoever can come get their production. In cooperatives that access credit as individuals rather than collectively, those who cannot access credit are not able to pool their production with their fellow members because it is not ready on time and is of a lower quality.

The cooperatives that are able to access credit report interest rates between 1.25% per month and 18% per season. Most get loans from microfinance institutions (MFIs), but some borrow from neighbors, community lending groups, or Kiva.com. Farmers would prefer to borrow from major banks as opposed to MFIs because they believe the rates to be lower and as a cooperative, they could get larger more meaningful loans.

Those cooperatives that have taken loans and paid them back are proud of their success and many do it every season. Of cooperatives that take out loans every season, some feel empowered by their financial security while others explained that they are afraid that if the bank ever stopped giving them loans, they would not have the money to buy inputs and harvest at all. Reliance on loans is understood

as a weakness. The most successful cooperatives in terms of credit utilize loans as a cooperative rather than as individuals. One cooperative explained that they take out one large loan, buy inputs and distribute them, cover emergencies during the season, collect production at the end of the season, sell it to ProDev, pay back the loan, and then distribute the profits based on each member's production minus their share of the loan used.

Some cooperatives are unable to get loans because they are not legally registered as a cooperative with the government (though EUCORD has helped many to get certified). Other cooperatives have yet to deliver to ProDev and so cannot use their contracts to prove their credit worthiness. Two cooperatives reported that they can't get loans because they don't own their land and thus cannot use their land as collateral.

A couple of cooperatives explained that if they could access credit, they could purchase the production of cooperative members and even neighbors and sell a greater quantity to ProDev. At a cooperative level, this would help prevent sales to the side market from members that need money for basic needs, school fees, and health insurance. If cooperatives could buy the production of their neighbors CREATE's impact could spread more easily to other cooperatives as participating cooperatives would have more incentive to share their knowledge. BRALIRWA would also have a larger pool of maize to draw from in order to reach their targets.

Banks have many requirements in order to get a loan and the larger the bank, the lower the interest rates and the more requirements they have. As cooperatives become more advanced it is important to "graduate" cooperatives up to the correct banking institution and for cooperatives to know what documents the bank requires in order to save time, transportation, and frustration. Most of the banks that work with farmers work with loan terms based on the harvest cycle. Most also prefer to work with cooperatives that are working with NGO projects as they have the best repayment and the NGO serves as a conduit for information between the farmers and the banks. One is even looking into a program in which NGOs could cosign on the cooperatives' loans. PASP also helps farmers access credit by providing partial collateral. Lack of crop insurance was cited as a concern for banks working with farmers. Irrigation and a guaranteed market were both listed as determinants of accessing credit for cooperatives. Many of the banks provide additional training for farmers on financial management.

One of the bank key informants I spoke to told me that they offer both pre-planting and post-harvest loans, recognizing that farmers have both needs. Importantly, the loan manager told me that the farmers who take both loans in a given year have the highest repayment rate compared to farmers who receive one or the other of the loans. Another informant explained that the best system they have found for repayment is to work directly with buyers like ProDev to receive payment for the loans from the buyer rather than the farmers. This kind of three party agreement is reportedly easy for ProDev and money can go straight into the cooperative's bank account which increases the amount farmers save for the following season.

Recommendations:

- Provide trainings on accessing credit and good financial management of loans. Farmers need to understand what a reasonable interest rate is, how to plan ahead so they can pay the loans and interest back, and what banks require in order to get a loan.
- Work with cooperatives to establish all of the requirements banks have in order to access credit.
- Encourage farmers to take out both pre-planting and post-harvest loans where possible and applicable.
- Where possible establish third party loan contracts where the buyer pays the bank directly as this also protects the farmer if payments are delayed and is preferred by banks.
- Work with banks to offer useful financial management trainings.
- Consider cosigning on loans with cooperatives that continue to struggle to access credit.

Transportation

The largest challenge raised by cooperatives that I did not expect nor ask about was transportation. Of the 29 EUCORD and RWARRI cooperatives, 16 reported that transportation was a key challenge. Two types of transportation problems were identified: getting crops from the fields to the storing and drying facilities, and getting production to ProDev.

Fields in the participating cooperatives rarely have roads or even paths that are accessible by trucks or motorcycles. This is especially true in Kayonza where the farms are in valleys or on hillsides. Cooperatives with very large plots of land have trouble gathering their production together and those that only have one post-harvest facility despite many areas for crops experienced high post-harvest losses. In addition to the losses, cooperatives that cannot gather their production cannot deliver it as a single batch to ProDev.

Many of the cooperatives (especially those in Kayonza) live in valleys with poor quality roads. During the rainy season, many of the farmers cannot get trucks in or out of the valley and their production spoils before it can be transported to market. Regardless of the road quality, cooperatives struggle to transport their production to market because the transportation companies require immediate payment despite the fact that the farmers will not be paid for their delivery for at least three days.

Ideally, this challenge can be overcome easily and is simply a lack of communication of needs between the farmers and the buyer. ProDev says that they have a fleet of trucks which could be utilized to overcome this problem. Alternatively, EUCORD could aid other cooperatives to arrange contracts with transportation companies to provide payment for the transport as part of their profits from selling their maize, as has been done by three EUCORD and RWARRI cooperatives already.

Recommendations:

- Work with cooperatives, banks, and the government to provide post-harvest facilities closer to the distant crop lands and consider inexpensive means of transport within the fields.
- Coordinate with ProDev to provide transportation for farmers' production or to set up third party contracts for the direct payment of transportation services by ProDev as part of cooperative payment.
- Coordinate with the government to highlight roads that need maintenance.
- Encourage cooperatives to save for the inevitable transportation costs from their income the previous season.

Irrigation

One of the most common concerns raised in FGDs was climate change. Based on further questioning, it seems that farmers don't necessarily know exactly what climate change is but that it means fewer and later rains. Most farmers are used to waiting for rain as the sign that it is time to plant. Unfortunately, with the changing environment, if farmers wait until the first rains to plant their first crops of the rainy season, it is too late. In addition to timing, farmers now face increased water management challenges. In order to grow during the dry season, farmers need access to irrigation equipment.

CREATE piloted different irrigation equipment and the cooperatives that were part of the pilot were thankful for the added production and ease of cultivating. They speak of the large benefit to their families and incomes to be able to have a third season in which they grow vegetables or cash crops. Some cooperatives express the same problem as with the post-harvest equipment, that the equipment is helpful, but insufficient compared to their land and production needs. They have seen the importance and value of irrigation equipment either from using it or seeing their neighbors and are willing to invest to access it.



RWARRI cooperatives seemed less aware and likely less effected by climate change and poor water management. Only 1 RWARRI cooperative mentioned irrigation as a challenge and none mentioned it as an area of improvement or success.

PASP is currently working with a government project to distribute information to farmers about the expected climate and daily weather forecasts. This will be a useful system to connect farmers to in order to better manage water.

Three major problems limit cooperatives' access to irrigation. 1) Many of the cooperatives have land on hills, especially in Kayonza, which can make irrigation more difficult. 2) Irrigation equipment is expensive and cooperatives cannot afford it without assistance. 3) Many cooperatives have spread out land which makes it difficult and more expensive to cover all of it with irrigation or to transport the equipment between plots.

Recommendations:

- Continue CREATE's plan to build on the success of the irrigation pilot to address farmer needs across most EUCORD cooperatives with an emphasis on cooperatives in Kayonza and cooperatives that have the teamwork and facilities to utilize irrigation.
- Make criteria for receiving irrigation or reduced cost irrigation clear to all cooperatives so those that do not meet the criteria do not feel the process is unjust but instead have solid targets to strive for.
- Consider treating large, spread out cooperatives as separate cooperatives for the purposes of distributing irrigation equipment.

Perception

Perception is the aspect of CREATE farthest on the horizon. Perception represents the way that farmers view themselves and others view farming. It can be compared to self-actualization in Maslow's hierarchy of needs. Some farmers are already talking about the desire to view themselves as professionals and to see farming as their job. Some of these farmers are looking to the industrialized countries and the way agriculture is not the work of peasants, but businessmen. Others simply want to love what they do and feel like a family with the people in their cooperatives.

Of the 29 CREATE cooperatives, perception was only brought up by 12. Of those, 9 said they do feel a love for what they are doing and/or felt like professionals. The other 3 said they want that. Two even identified it as a criterion for the success of the project. This concept is comparatively not being considered by the control group. Only 1 of the 4 control group cooperatives mentioned the idea of feeling like professionals.

Beyond the motivation that comes from feeling like a professional who loves what they do, the external perception of farming will become more important for the future of cooperatives in Rwanda. As one key informant pointed out, farming faces an aging population. Youth are drawn to the cities and the chance of profitable jobs/entrepreneurship. If youth do not see farming as a legitimate profession that is profitable, cooperatives will struggle to recruit youth. Without youth, cooperative's knowledge cannot be passed down to the next generation and aging farmers will not be able to perform the strength and endurance based tasks required to cultivate and harvest.

One problem within perception is the view of some farmers that they are doing far worse than other cooperatives or are not receiving the same benefits. One key informant explained that some farmers say they hear some cooperatives are getting 10-12 tonnes/ht, which is simply not true.

Recommendations:

- Encourage cooperatives to work as a team and a single unit. Farmers expressed the desire for trainings on the benefits of being in a cooperative as well as more on the tasks of cooperative management. The role of the cooperative as a family can be part of management, cooperative, and financial management trainings.
- Train prosperous cooperatives on how to attract youth. Consider partnering with the government's youth in agriculture program or the World Bank's youth projects.
- When asked about how they would define success for the project, one cooperative said they didn't know what standards EUCORD had set for the project. Consider expressing this as a soft goal of the project to cooperatives. Thinking about being professionals will likely create motivation and increase the chances farmers achieve it.

Financial Management

Financial management ranges from simple record keeping to the more advanced investment of cooperative money to develop the members. The level of cooperative success in this area ranges similarly.

Some cooperatives still are not doing accurate record keeping which limits their ability to know the impact of the project, validate using expensive inputs, and share costs and benefits accurately across members. Of the 29 CREATE cooperatives, 6 told me they do not effectively track inputs, production, or both. Cooperatives that do not track these say that the trainings were too short or that too few people attended them. Some say that the books for record keeping are too expensive. Others say they are trying but find the process difficult, especially tracking production. Some cooperatives reported that they do not have an accurate scale to track member production and so are unable to distribute costs and benefits correctly. Some say this keeps them from working as a single buyer and seller rather than individual farmers while others report that they cannot keep accurate records without a scale.

Many cooperatives have been very successful in adopting record keeping. They say that they now know the benefits that they receive from following the advice of the agronomists. During the rapid rural appraisal questions, many of the farmers pointed out that they would not have been able to answer the questions before the project because they didn't know how much they produced or how much they spent. For many, record keeping has turned into the ability to plan family spending based on predicted income and the expenses of the household and farming. Farmers told me that before, they weren't able to plan; they simply spent what needed to be spent and hoped they would earn enough to cover it.

Several of the strongest cooperatives have gone beyond record keeping, using the cooperative's money to invest in members and the cooperative as a whole. One cooperative has purchased cows and goats for members that did not have them. Another cooperative reported that by having record keeping, they collect dues from members on time and divide profits equitably between members. One cooperative told me that the management team used to spend money on beers during their meeting, but with management training and record keeping, they spend the money on the cooperative and can prove where every Rwf has been spent, building trust between the members and the management team. Many cooperatives have also hired an accountant to track their finances.

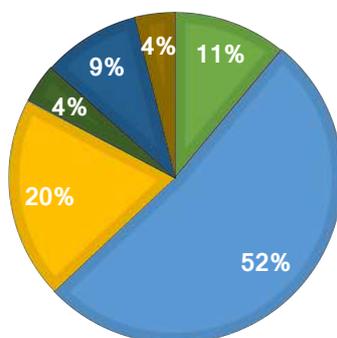
RWARRI cooperatives appear to have adopted record keeping and financial management more than EUCORD cooperatives. They have better access to credit, though not all of them trust themselves to utilize that access. RWARRI prioritizes record keeping and utilizes this to provide them continuous monitoring and evaluation.

On an individual level, farmers also report an increase in personal financial management. Many farmers have opened a bank account and have high enough income to save money every season. One of the rapid rural appraisal questions asked farmers to place nuts in one hand to represent how much of their income each year they spent and how much they saved. Farmers reported a significant increase in their savings because they know saving is important and they have increased income. Most told me that before the project, their savings hand would be empty as would everyone else around the circle. One cooperative told me that, "Before we didn't have bank accounts. Now everyone has a bank account and even old women can buy a phone."

The average reported savings was 19% with a standard deviation of 20. Farmers report their savings anywhere from 0 (I had no negative option though some told me that they sometimes they have to spend more than they earn) to 80% (the latter seeming highly unlikely but occurring four times in 286 responses). Savings between 5% and 10% were most common, with 43% of all respondents reporting in that window. Farmers told me that trainings from Rabobank taught them that 20% is the proper amount of savings. It is likely that this skewed the data towards that average. Figure 4 shows the percent of respondents that reported their savings to be between 1% and 15%, 16% and 30%, 31% and 45%, 45% and 60%, or 61% and 80%.

Figure 4: Distribution of Percent of Income Saved

■ No savings ■ 1% to 15% of income ■ 16% to 30% of income
■ 31% to 45% of income ■ 46% to 60% of income ■ 61% to 80% of income



RWARRI cooperatives reported average savings of 20% with a standard deviation of 22. Control group farmers had an average of 15% with a standard deviation of 18.

In all cases, it is likely that farmers overestimated their savings, especially those that placed their savings over 20% (which 73 out of 286 farmers did). Farmers without families told me that they have been able to save for their education or future and represent the minority for whom a high rate of spending might be true. While much of the inflating of numbers was likely done for me and for EUCORD, this is still valuable as it tells us that farmers consider their financial management to be far better than before and understand the importance of saving.

Many cooperatives also reported that their savings this year have been lower than they expect in the future because they spent a great deal of their increased income on improving themselves. They purchased health insurance, paid school fees, bought livestock, and improved their houses. Many farmers were frustrated by the question when told to consider investments such as buying a cow or land as spending rather than saving. They told me that the bank charges them to have a savings account and that buying a cow or land meant making more money rather than spending it. One cooperative reported that they expect to have increased savings as they continue to benefit from CREATE.

In the future financial management skills will be even more important. One of my key informants pointed out that a cooperative's success in the future will be based on whether they know what to do with their increased income. Farmers and cooperatives that buy their neighbor's production, purchase machinery or advanced inputs, and ensure all members have good houses, livestock, and enough to eat, will create thriving cooperatives. However, cooperatives that do not invest in themselves may squander the money and the benefits of the project will have limited impact on their lives.

Recommendations:

- Hold more trainings on record keeping and consider making them longer.
- Have financial management follow up similar to the follow up that cooperatives receive from the agronomists on cultivation.
- In management training, share the successes of cooperatives with strong investment. Help management teams create investment plans.
- Encourage investment as a valid form of savings, but not to the point of having no liquid savings to buy inputs and cover costs between planting and getting paid for their production.

- Explain the rise and fall of international market prices in order to encourage savings during high market prices to carry them over during time of low market prices.

Cooperatives: membership and management

Cooperatives want to visit other cooperatives and learn from the most successful ones. The most successful cooperatives are looking to the future optimistically and want to share what they have learned with others. Setting up cooperative visits can fulfill both interests and increase the longevity of the project after CREATE ends. Seven cooperatives state that they already do this with the cooperatives that they meet at trainings and that it has been very beneficial.

Cooperatives that work well together and act as a single unit understand that this gives them a great deal of buying and selling power as well as increasing the effect of the training and assistance they receive. Cooperatives that do not work as a team do not always recognize that this is holding them back.

The management training some cooperatives have received is highly valued by those management teams. They state that everyone now knows their tasks rather than the president doing everything or tasks not being completed at all. The increased production that EUCORD trainings have brought has also increased the power of the cooperative. Management reports that membership is up and that it is easier to motivate farmers to follow the trainings and rules of the cooperative. One cooperative has reached out to the local government in order to be a key organization in the community. They help non-cooperative members in the community pay for health insurance and have cooperative members who work in the local government.

Cooperatives that say the most helpful thing is the knowledge or market tend to be more positive throughout the focus group, have many benefits to list, and overall have a good focus group. These groups ask for trainings and for more interaction with other coops. Those that focus on material things as the most helpful tend to be far more negative, focus on challenges, and tell me all the things they want and need in order to be successful. These groups tend to reference other coops as points of comparison.

Recommendations:

- Use successful cooperatives as “demo plots.” Have farmers visit farmers that have advanced by utilizing the training and advice EUCORD has given them. This will save the agronomists’ time spent on demo plots, fulfill farmers’ desire for demos, and highlight cooperatives that have been successful. Farmers are more likely to believe they can achieve the success of other cooperatives than the success of the agronomists.
- Expand management training to the cooperatives that have not received it. In these trainings highlight the importance of working together as a unified team.

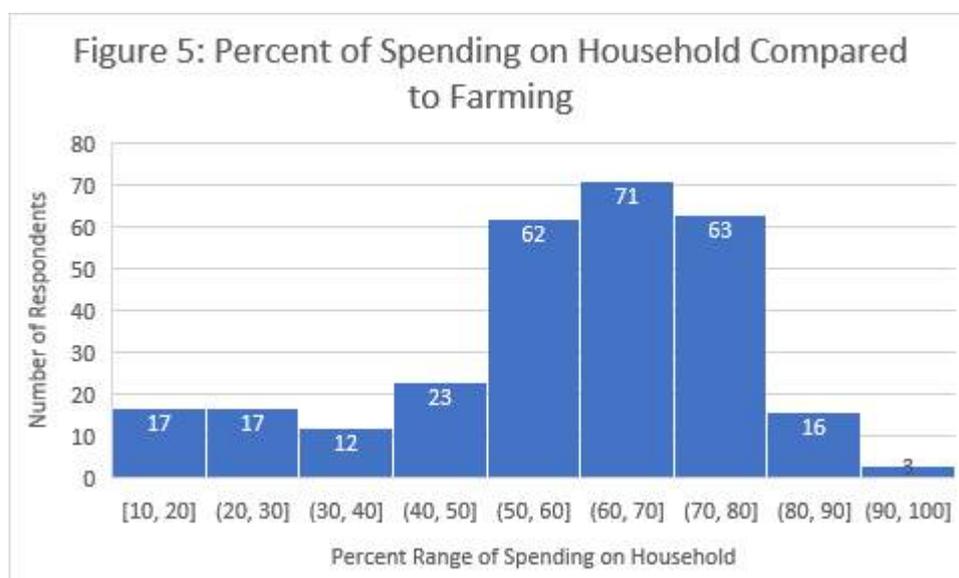
Households

When asked about changes in their households, FGDs provided a long list of important changes they have been able to create for their families because of CREATE and their increased production. Farmers said that their living standard has increased and that they have been able to develop themselves. The following are the most commonly mentioned changes in EUCORD and RWARRI cooperatives with the number of cooperatives that mentioned each change in parentheses after it: able to buy health insurance on time (18), bought livestock (15), can pay school fees (15), improved housing (13), eat healthier and/or children do not get malnutrition sickness (12), get solar electricity (7), can buy clothing (6), bought a bicycle (3), bought land (2), started a business (2). One cooperative president remarked that in the village, cooperative members have nicer homes than non-coop

members. One farmer explained that the household now benefits from the farming and another reported that the project has “brought us out of poverty.”

One of the rapid rural appraisal questions asked farmers to place nuts in one hand to represent how much of their spending each year was spent on the household and in the other hand to represent how much was spent on farming. After the question, I asked how this had changed since the start of the project. Of EUCORD and RWARRI cooperatives, 20 reported that they spend more on the household and 1 reported they spend less on the household. 13 cooperatives report they spend more on farming than they used to and 3 report they spend less on farming. 8 of the previously mentioned increases were cooperatives that reported they have increased spending on both farming and the household. Not every cooperative spoke to both household and farming spending changes and some didn’t explain either. Those that received machines from CREATE said that they now spend less on farming than they used to due to the man hours saved by the machines.

Average household spending reported was 61% of total spending with a standard deviation of 19. Like savings, the data had a wide range with most (63%) of the data between 60% and 80% of total spending. Figure 5 displays the frequency of responses. One hundred minus the range on the x-axis tells the percent spent on farming.



The average for RWARRI cooperatives was 59% with a standard deviation of 18. The control group average was 67% with a standard deviation of 13. In the control group FGDs, one cooperative said that they don’t track how much they spend on farming. One cooperative spoke of farming and household spending as a tradeoff and said that they buy fertilizer now which means less money for the household. Two cooperatives said they now get enough food to eat though it was unclear how this affected their spending.

Recommendations:

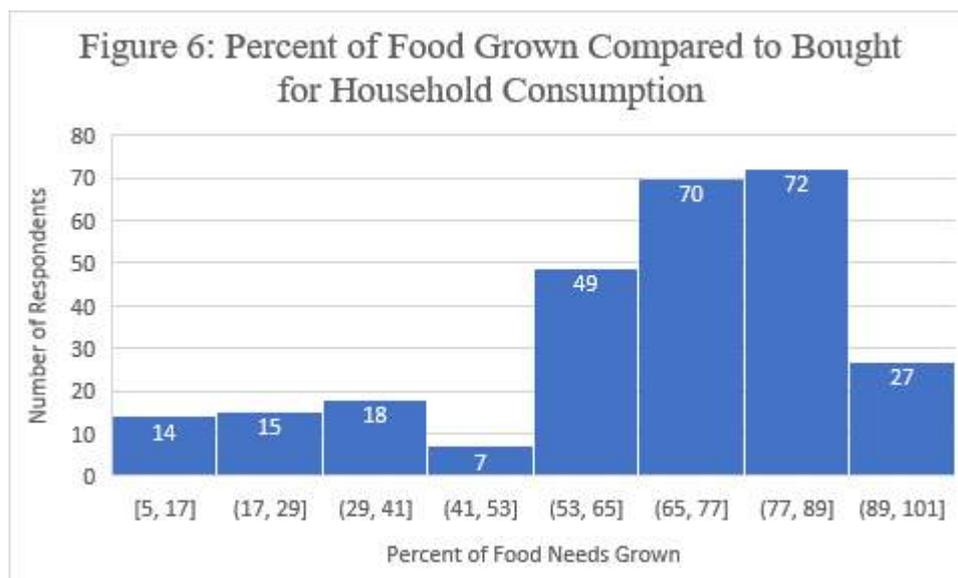
- Cooperative members are very proud of their accomplishments and that they are “developing themselves.” They want donors and project staff to know that they are using what they are taught and given. To address perception and recognize household improvements, CREATE should consider a certificate program that recognizes cooperatives that have developed themselves as professionals.

Food security

One of the objectives of CREATE is to increase food security. Farmers are selling a larger proportion of their crops than expected; however, the FGDs do not support the concern that farmers are sacrificing household food security for extra income with the high price of maize. Instead, cooperatives report that they have more and healthier food for their families. The final rapid rural appraisal question asked farmers to place nuts in one hand to represent how much of their family's food needs for a year are grown and in the other hand for the amount bought.



Among EUCORD cooperatives, the average is 65% grown as opposed to bought with a standard deviation of 22.



RWARRI cooperatives had an average of 71% with a standard deviation of 18. Control group cooperatives had an average of 64% and a standard deviation of 16. The percent grown does not change much between the control group and the CREATE cooperatives, and the control group also said they are able to provide more food for the household from their farms. The main difference is control cooperatives do not report buying better food from the market due to better income. They also report greater fluctuations in their food security by season.

Of the EUCORD and RWARRI cooperatives, 21 said that they eat more food and healthier food than before the project. This does not mean that the other eight do not eat better, only that they did not specifically mention it. Farmers said that they grow more than they used to and can store some for their families. They said that by selling more of their production at a higher price, they can buy food needs they cannot provide through farming. Oil and homemade porridge were mentioned multiple times as a new addition to household consumption. One cooperative said that they are now able to eat three meals a day where before the project they only ate twice a day. Another farmer explained that with more food, they are a happy family. Cooperatives report that kids do not get malnutrition sickness like they did before the project and that they are able to feed their children as much as they want.

Three cooperatives said that getting enough food is harder in the dry season. Not all cooperatives feel food secure. Of the eight that did not say they eat more and healthier, some reported that with the change in their land they no longer have enough to feed their families.

Recommendations:

- Most cooperatives do not have enough storing capacity to store for household consumption and having more storage containers would mean they could save money by not buying food from the local markets.
- Now that farmers can buy healthier food, they would likely benefit from training around how to build a balanced diet.

Gender

Cooperatives had a lot of positive things to say about gender equality. Many stated that they started with strong gender equality, while others attributed it either to CREATE or to the work of other NGOs. Every cooperative including control group cooperatives claimed to have gender equality.

The most common way cooperatives claimed equality was through numbers. Cooperatives that used to only have women now have men and cooperatives that used to be all men have women. Women are now at least 30% of management which is mandated by the government, but most cooperatives go farther to have closer to an even split. Cooperatives in all three groups claimed that men and women receive the same benefits and do the same tasks.

In CREATE cooperatives, farmers told me that men used to not want their wives to join cooperatives but now the men join as well because they saw the benefits of being members. Now both genders work together. The fact that all voices are now heard equally and that everyone has the right to speak was raised by many cooperatives. One man said that women have good ideas. One woman said that as women they don't fear going to meetings and speaking up and that they are not afraid to go learn from others and share with the men and the rest what they have learned.

Women most often spoke of their increased financial standing and knowledge base. One woman said that women used to be scared of some tasks and now they can all do the same tasks and some women have side production to sell for their own money. CREATE requires that women attend trainings which enhances their knowledge and makes them income generators. One woman explained that “Women got trained and now know how to farm and they ‘touch money’ which is very important to us. Women used to ask men for money to buy clothes.” Now women have their own bank accounts and are part of the decision-making process around how household money will be spent. One man said, “The project taught us that we weren't competing with each other. Now men and women talk before selling to decide together on how much to save and sell and what to do with money. Women go to trainings and whole household benefits.”

Some women spoke vehemently about their improved status and empowerment. One woman reported that “There's nothing a man can do that I can't do. If a man isn't there, I can do the irrigation.” Through this project and others, women have been empowered to speak and act for themselves and their families. One key informant explained that women no longer say that they have no money for their kids because their husband spent it.



Key informants also reported that women have more knowledge and financial control because they receive trainings and know the quantity that is delivered to market and the price. When ProDev pays farmers directly into a bank account, the women have much greater access to the money.

While every cooperative claimed gender equality, I noted several additional observations. Men did more of the talking about gender equality than women. When I attempted to do gender-separated focus groups, I was encouraged to interview the women first so that they would be less inconvenienced and could return to their many tasks sooner. Even if farming tasks are being split equally, they are likely not being split equitably as women bear more of the domestic and care tasks of the household. One cooperative that had received extensive gender training from another NGO told me that now men understand that they can help with cooking and bathing their children without it being criticized or even considered black magic.

In the coops with female leadership, the women talk a lot and are very knowledgeable. In the coops with mainly male leadership, the women are much quieter, but not because of power dynamics, but because they seem to be generally less informed than their male counterparts or they simply agree. Women seem genuine when they are assertive and say that they would simply say what has already been said. Usually the men leave space for the women to answer the gender questions and the women choose not to.

In the two cooperatives where men and women were interviewed separately, my translator commented that it felt like we were interviewing two totally different cooperatives. There was as much similarity between cooperatives as within them. In general, the women's groups seemed less informed and narrowed in on the aspects of farming and household production that concerned them most. In those two examples, the women knew less about production, trainings, and post-harvest. Across all of the focus groups, women tended to speak more on changes within the household and savings.

Recommendations:

- Where possible, it would be good to teach the difference between equality and equity, meaning the difference between women being able to do all of the same tasks versus women carrying a similar amount of the weight in supporting the family.
- Record keeping trainings can be gender sensitive to the importance of discussing saving, selling, and spending as a household.
- When ProDev pays directly into member bank accounts, women benefit from direct access to money.

Additional Findings

Many cooperatives expressed frustration with the government's ability to remove them from their land, force them to grow a different crop, or transform the land into terraces. Many farmers have been moved off swamp land that had easy water management so rice could be grown there instead. Other cooperatives have been moved so that companies could utilize profitable land near roads. Many of the cooperatives EUCORD works with were pushed into maize cultivation by the government and now appreciate the change. Government intervention can be good or bad, but is viewed by farmers as making them vulnerable. Cooperatives that do not own their land cite this as a major concern for their stability and security.

The people of Rwamagana in general look healthier and cleaner. They have better access to roads and markets. Their land is flatter and they get more rain. The cooperatives in Kayonza are more vulnerable, treated me as a superior, and speak very highly of the agronomist and his continuous follow up. In Ngoma, the RWARRI cooperatives appear to have been selected from some of the best and are both active cooperatives and have consistent communication with their agronomist. Overall,

most CREATE cooperatives have made a point of saying that the agronomists follow up when others don't and that EUCORD and RWARRI deliver on their promises.

Key informants in NGOs and the government report that EUCORD does a great job of coordinating with the network of actors to provide services to farmers as well as added value. NGOs doing similar work knew CREATE Rwanda's project coordinator, had good communication with him, and trusted EUCORD's on the ground knowledge. Through this network, projects make sure to complement and not double efforts and services. All of the organizations I spoke to expressed the desire for EUCORD to expand its work to more of their beneficiaries and partners. Some went further to express that EUCORD should do more to work with farmers who are not in cooperatives.

Farmers and key informants report that ProDev's pricing scheme of market price plus 10 Rwf is a good model and meets farmer and business needs. Farmers are unlikely to agree to a range of prices nor a maximum price, while it is dangerous for the buyer to put a minimum price.

Recommendations:

- One key informant recommended that EUCORD leverage its connection with cooperatives to build up cooperative representatives/promoters between the cooperatives and the government. He also highlighted working with existing farmer promoters to reach more farmers than just those participating in CREATE.

Success and Cumulative Impact

It is a good sign of success that cooperatives that do not work with CREATE wish they did and that membership in cooperatives that participate in CREATE is growing. Similarly, the desire by key informants for EUCORD to expand speaks to the project's success.

Many cooperatives are using what they learn and applying it to their own gardens and other aspects of their lives to improve themselves. Those with private gardens that use lanes brag about increased food security for their families. On the other side, some cooperatives do not take their knowledge outside the field and have fewer changes to report. One even commented that they have not cultivated maize since their record keeping training and so have not had any inputs to track, implying that they neither use fertilizer nor keep records during the seasons of their other crops.



When asked what constituted success for the project, many FGD participants had never considered how they would measure the success of the project. In the end, many said that success was based on one of five things: 1) increased production and living standard, 2) having the equipment and facilities they need, 3) being able to solve the challenges they mentioned throughout the FGD such as post-harvest losses, loans, irrigation, and change of land, 4) loving what they do, and 5) never going back to where they were before the project. Many of the cooperatives went further to say that success is achieved if they can go out and teach others what they have learned and run their own projects. Some want to become fertilizer and seed sellers. Farmers are thinking about the sustainability of the project and how they will retain and spread what they have learned. As one farmer put it, success is when “We are like an agronomist in our own minds.”

Other actors within the project network expressed other measures of success. Most highlighted quantitative measures such as number of contracts fulfilled or production per ht. Some key informants discussed the importance of qualitative measures such as the success stories of farmers. Similar to some of the farmers, one key informant pointed out that success is based on if farmers learn and benefit in such a way that they won't go back to where they were before the project. As one key informant put it, “numbers tell you whether the project is creating progress, conversations tell you whether it is sustainable change or if it is being done at any cost.”

Key informants within the value chain report that they believe the project will continue to change the lives of farmers because they have been integrated into the supply chain where both sides are incentivized to work together to solve problems. However, better channels of communication will need to be established before CREATE ends as EUCORD currently serves as the conduit for needs and concerns. Transportation needs highlight that even with EUCORD, farmers have challenges that aren't communicated to ProDev.

When comparing CREATE cooperatives to non-CREATE cooperatives, key informants report that CREATE cooperatives have better land preparation and timing, use the correct inputs, have higher production, lower post-harvest losses, more knowledge about crop rotation, better connections with financial institutions, and are more motivated to produce higher quantity and quality. One informant explained that CREATE cooperatives are producing three or more tonnes/ha while others are producing less than two. Another said that farmers used to be afraid of working with financial institutions because they didn't trust their ability to pay the loans back. Now with increased and steady production and lower losses as well as a guaranteed market, banks and farmers have more faith. Overall, these informants say that there is a visible difference between crops. I experienced this visiting a control cooperative located adjacent to a EUCORD cooperative. The border between the fields was clear from the immediate change in the quality and density of the crops.

Beyond the farmers, ProDev, MINIMEX and BRALIRWA, report positive change as well. These companies have been able to increase the percent of their maize that is locally sourced, dampen the impacts of international price spikes and maize export bans, and decrease their dependence on the dollar as purchasing from the international market requires converting Rwf to USD.

Limitations

This report focused on EUCORD cooperatives, which meant that very little data was collected on RWARRI cooperatives or on control groups. The latter two groups were much harder to reach and the report valued absolute changes over relative changes compared to non-CREATE cooperatives. However, this means the report is limited in its ability to say what the project has provided to farmers that the government of Rwanda is not.

Cooperatives' responses were coded based on everyone's comments which means that if one person said that his family eats better or that he is unable to access inputs on time, the entire cooperative was coded as reporting better nutrition and a challenge with inputs. Not everyone agreed on all topics as can be seen by the spread of answers in the rapid rural appraisal questions everyone answered.

The rapid rural appraisal questions were not able to get accurate data as they were imprecise and had error both in the participants' estimation skills and in my ability to eyeball the percent of nuts in each hand. Many of the farmers admitted that they do not keep good track of their savings, spending, and production, meaning many of their answers were broad guesses. Many of the answers may have been an attempt to answer what they thought they should answer. The fact that all participants answered may have tempered the effect of trying to figure out "the correct answer," but also meant that where only the most informed answered the FGD questions, those without much information answered the rapid rural appraisal questions.

The control group cooperatives were all interested in becoming part of CREATE and part of the incentive for them to participate was the chance for EUCORD to consider adding them to the project. It is likely that they attempted to both display their ability to develop themselves and their challenges within the areas they knew EUCORD works to improve. In this way the control data is likely more polarized than is accurate.

Annexes

Annex 1: Pilot Focus Group Questions

1. What changes have you seen in your field since the start of the project? What changes have you seen in your household since the start of the project?
2. How has your cooperative changed since the start of the project?
3. How have your record keeping practices changed since the start of the project?
4. What are some of the challenges and benefits of being in your coop?
5. How has your access to farming inputs changed since the start of the project?
6. How have your farming practices changed since the start of the project?
7. What trainings have you received? Which have you found most helpful? Which have been least helpful?
 - 4 corners activity – based on the trainings listed ask participants to go to the corner of the room designated for the training they found most helpful
8. How has your access to money and your family spending changed since the start of the project?
9. How has the way you sell your maize changed since the start of the project?
10. How has the support you receive from outside the coop changed since the start of the project?
11. What have been the effects of installing irrigation in your fields thus far?
12. Have gender roles changed in your community or coop since the start of the project?
13. How have your family food needs changed since the start of the project?
 - Nut activity - How much of your family's food needs do you grow and how much do you buy
14. What has been most helpful about the project so far? If you ran this project, what would you change?

Annex 2: Updated Focus Group Questions

1. What services do you receive from EUCORD?
2. What changes have you seen in your field since the start of the project?
3. What changes have you seen in your household since the start of the project?
4. What changes have you seen in your cooperative since the start of the project? That might include management, membership, or the way you interact with other cooperatives.
5. Have your record keeping practices changed since the start of the project?
6. How has your access to farming inputs changed since the start of the project? That might include machinery, seeds, fertilizer, and/or pesticide.
7. How have your farming practices changed since the start of the project?
8. How has your access to credit changed since the start of the project?
9. How has the way you sell your maize changed since the start of the project? Do you ever have to sell early?
10. How has the support you receive from outside the coop changed since the start of the project?
11. Which of the following trainings have you found most helpful: Post-harvest, cultivating/fertilizing, where/when to sell, record keeping?
 - 4 corners activity – please to go to the corner of the room designated for the training you found most helpful
12. Have gender roles changed in your community or coop since the start of the project?
13. What challenges do you face?
14. Nut RRA questions:
 - Please place in one hand to represent how much you used to produce and in the other to represent how much you produce now
 - Thinking about your income for a year, please place in one hand to show how much you save and in the other to show how much you spend
 - Thinking about your spending, please place in one hand to show how much you spend on the household and in the other to show how much you spend on farming
 - Thinking about your family's food needs for a year, please place in one hand to show how much of it you grow and in the other to show how much you buy
15. What part of this project has been the most helpful?
16. What does success look like to you for this project?

Annex 3: Informed Consent Speech

My name is Laura and I am a student from the United States. I am volunteering with EUCORD to help them learn the impact of their projects and make them better. You do not need to participate in this group interview if you do not want to and you can leave or not answer at any time. Your participation or not will not affect the services you receive from EUCORD or the specialists. You also will not receive any extra benefits for participating. You will not be affected in any way based on the information you give me. I am not keeping track of who came to this or who didn't. If at any time you do not understand some of the words or concepts, I will take time to explain them as I go along and you can ask questions at any time. The information you give me will be very helpful to me and to EUCORD to make this project and projects in the future better. I will be asking a bunch of questions for anyone to answer. You do not have to agree on one answer as a group. Some of you may have different experiences than others. Please share your opinion even if it is different from others. I will not ask you about your personal beliefs, practices or stories and you do not have to share any knowledge that you are not comfortable sharing. Questions will be similar to: "what changes have you seen in your field since the start of the project?" I hope to hear good things and bad things as both will help make the project better. I expect this to take about an hour.

I will not be keeping track of who said what. Only the people in this room will know what you said. I will record the interview, only so I can remember what was said. No one will listen to it but me and you will not be identified during the discussion. When I share what I have learned with EUCORD and the specialists, I will not include which cooperatives said each thing unless I specifically ask you if I can share that information with EUCORD in order to make the project better and you say yes. I ask that you and others in the group not talk to people outside the group about what was said in the group. You should know, however, that I cannot stop or prevent participants who were in the group from sharing things.

My research will take place over the next 9 weeks. During that time, I will be meeting with 33 cooperatives to run interviews like this. If you have any questions about my research, findings, or what I will be doing with the information, you can ask them now or later. If you wish to ask questions later, you can get my contact information from any of the specialists and contact me privately. Is Kinyarwanda everyone's primary language?