



An Impact Assessment of Opportunity International's Agricultural Lending Program in Uganda, Malawi, and Ghana

**Project Title:
"Financial Services for Rural Communities and Smallholder Farmers in Africa"**

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Executive Summary

In October 2009 Opportunity International obtained funding from the Bill and Melinda Gates Foundation and The MasterCard Foundation for a bold new experiment in Agricultural Development Financing. The project, entitled "Financial Services for Rural Communities and Smallholder Farmers in Africa," was a four year \$16 million venture based on the following premise.

"By supporting the rural areas with comprehensive financial services, Opportunity believes it can provide a successful example to the world of how to improve farm productivity and alleviate rural poverty, thereby contributing a piece of the puzzle that will give developing agriculturally-based economies opportunity to transition to thriving and diversified economies."

This document presents the results of an assessment that investigated the impact of this intervention on the lives and well-being of the Opportunity International agricultural loan recipients. It is based on the results of an extensive three country study that involved both qualitative and quantitative approaches.

The agricultural lending program has made a major contribution to the Opportunity mission to transform the lives of poor people. The fact that 68%¹ of all clients surveyed reported an entirely positive experience with their agricultural loan attests to the contribution of the program under which farmers have:

- Been exposed to extension support and training to learn good agricultural practices, and obtained vital access to agricultural inputs in order to actually increase adoption of the good agricultural practices they have been taught.
- Expanded the area under production as a result of purchases or rental of land and hiring of additional agricultural labor during times of critical labor constraint.
- Been linked to more reliable and less exploitative marketing channels with greater transparency of pricing and sale of produce by weight rather than the bag.
- Been able to purchase household assets, livestock and commercial properties, and invest in non-agricultural income generating activities such as transportation, petty trade, produce buying, livestock rearing, and salt mining to spread out their cash flow and diversify their risk.
- Increased their production as well as the quantities marketed of the target crops.
- Improved their household cash flow which has made it easier for clients to educate their children, pay for health care and improve food security.
- Improved their economic standing in the community, and ability to meet basic needs.

A key aspect of Opportunity's strategy is a clear understanding that microfinance providers are just one of the key stakeholders and that coordinating with all stakeholders in the rural model: farmers groups, extension service providers, input suppliers, and output markets, is essential to the success of rural lending. The majority of clients have positive impressions of Opportunity's services and the impact that the agricultural loans have had on their livelihoods. Those clients who reported on negative experiences were predominantly involved with production of crops that did not succeed for a variety of reasons that are presented in greater detail in the study.

- An assessment of the partnership arrangements for each of the 11 commodities across 9 locations highlights the importance of value chain partnerships on the ultimate impact of the loan on

¹ A total of 83% of client made positive comments, but of these 15% also raised certain constraints. See section 2.5.

household well-being. This requires an in-depth understanding of the local economic environment as well as the dynamics of production and marketing between value chain actors.

- There were farmers of certain key crops that did not experience positive yield, productivity, and income changes (i.e. cotton in Uganda and soybeans in Malawi).
- A careful review of the factors involved in these less positive contexts highlights the importance of all of the value chain players (Opportunity Bank, but also strategic partners offering extension advice, input supply and market linkages) fulfilling their roles in a timely and optimal manner.

Thanks to the interventions of the agricultural credit program, in collaboration with the key value chain partners, client households were able to increase their production as well as the quantities marketed of the target crops. In most cases this was as a result of increased yields, but expansion of area under cultivation was also noted. The increased production generated income which improved household cash flow, making it easier for clients to educate their children, pay for health care and improve food security. This in turn improved their economic standing in the community, and ability to meet basic needs. The study has shown that these secondary impacts on household well-being are significant, with clients scoring higher than control households in the same locations on almost every indicator. Gender analysis does reveal, however, that female-headed households are relatively disadvantaged, even among clients, because of their more limited labor and resource base.

The results show that Opportunity Bank has made significant progress in establishing itself as a pioneer in agricultural lending in Africa and that this program has positively impacted thousands of small scale farmers. The bank has greatly expanded its network of rural branches and access points, and disbursed over 99,000 smallholder agricultural loans averaging less than \$500/household in the last four years. This has resulted in improved visibility for Opportunity as the Bank that gives loans with favorable maturity periods and conditions suitable for agriculture in Africa. The increased visibility has also enabled the Bank to market other products notably specially tailored saving accounts, individual value chain actor lending and equipment purchase loans.

The study also highlights the importance of continued attention on the part of Opportunity Bank to the difficult task of nurturing the necessary partnerships with other key stakeholders that will benefit farmers within the structure of their particular value chain. Agricultural finance is especially complex. So many factors are outside the control of both the lender and the borrower. To manage risk for both the farmers and the bank, Opportunity recognizes that the loan products and implementation arrangements need to be carefully tailored to local conditions and actively foster critical value chain partnerships ensuring access to extension support, input supply, and profitable markets. Furthermore, they need to adjust and evolve in response to changing market conditions and technical opportunities. This is the key to Opportunity Bank's continued success.

Clearly there are significant challenges in trying to provide agricultural financing under such conditions. Despite the challenges, the positive assessment of the loan program by the surveyed clients attests to both the desperate needs of the farmers and the care and effort Opportunity has invested in tailoring the products to local conditions and responding proactively to the difficult situations on the ground.

"In my books, and as someone who has played the role of ESP, just having access to financial services to procure agricultural inputs is one of the most critical stages of the agricultural value chain and the most important and most appreciated interventions in the agricultural value chains. Usually when you provide agronomic and business skills training to the farmer without the assurance of the provision of inputs at some stage, the intervention is doomed to failure. The fact that Opportunity exists to provide financial services/input credit gives many ESPs confidence to reach out to farmers. Should Opportunity stop supporting the selected agricultural chains in Ghana, some of them would stall, stop or retard. Period. Opportunity is currently the ONLY financial services provider that has accepted the risk of agricultural loans at that scale. Sometimes you need to interact with farmers to see their desperation and despair when they do not have access to inputs for their farms and therefore appreciate the almost 'messianic' role of Opportunity in Ghana."

Kwame Aduako Aboagye-Atta, Director, Entrepid Project Solutions, Ltd.

1. Background

In October 2009 Opportunity International obtained funding from the MasterCard Foundation and the Bill and Melinda Gates Foundation for a bold new experiment in agricultural development financing. The project, entitled "Financial Services for Rural Communities and Smallholder Farmers in Africa," was a four year \$16 million venture based on the following premise.

"By supporting the rural areas with comprehensive financial services, Opportunity believes it can provide a successful example to the world of how to improve farm productivity and alleviate rural poverty, thereby contributing a piece of the puzzle that will give developing agriculturally-based economies opportunity to transition to thriving and diversified economies."

Objective: *to extend a full range of financial services to the rural areas, including the collection of savings and provision of agricultural loans to the smallholder farmers in five countries in Africa: Malawi, Ghana, Mozambique, Uganda and Rwanda.*

The proposal was specifically designed to address the dire straits of agriculture in Africa, where:

- \$50 billion is spent per year on basic food imports to Africa.
- World Food Program has been operating to address food crises in Africa for 35 years and yet the need for continued intervention is unabated.
- Africa has 1 billion people, with 65% of the population directly involved in agriculture, and they are still not capable of feeding 100%.
- There is a systemic problem of low investment in agricultural research.
- Use of improved seed and fertilizer is low due to the high cost of access.
- Farmers face weak and volatile markets. Small producers have no bargaining power.
- Most countries exhibit a poor policy and regulatory environment.

While agricultural finance is admittedly critical to long-term agricultural development, lending to smallholder farmers is inherently challenging for the private sector due to the following factors:

Repayment

- Poor farmer repayment reputation
- High level of farmer default
- Long loan periods with lump sum repayments after harvest

Costs

- High transaction and monitoring costs

Risks

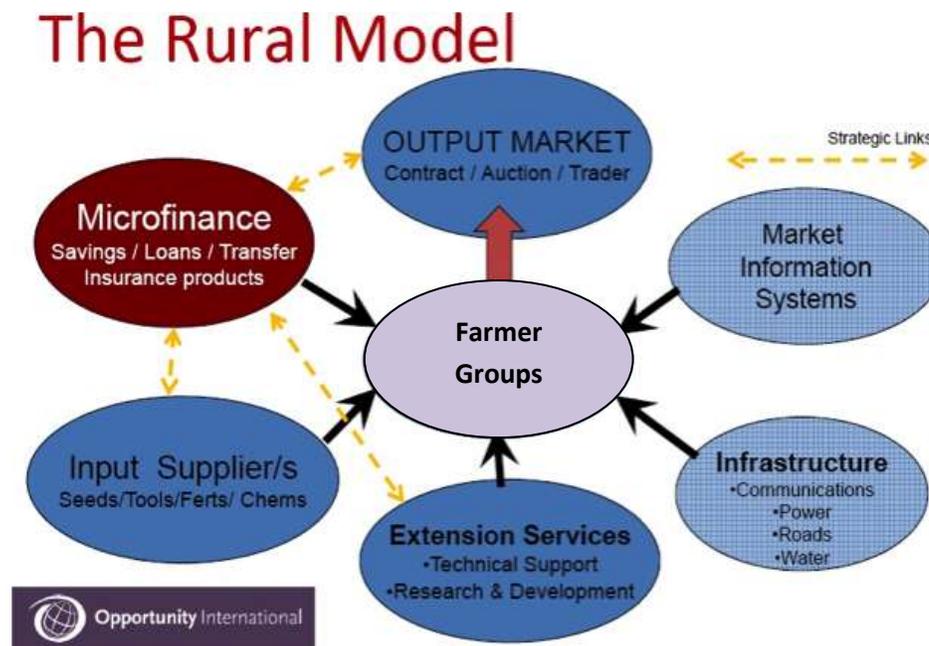
- Production risk due to weather and disease
- Price risk due to volatile and weak output markets

Client Financial Situation

- No regular monthly income
- Need for savings to survive until the next harvest
- Household food security and immediate cash needs have to take precedence over loan repayment

To address these challenges and risks, Opportunity proposed the “RURAL MODEL” as the framework for the project. This model highlights the primary importance of partnerships with respect to extension support, input supplies, and output markets to maximize the positive impact of the agricultural financing on household production, incomes and livelihoods while minimizing the bank's exposure to risk. The rural model is illustrated below:

Figure 1. The Rural Model



To minimize risk, therefore, the bank looked for, or sought to facilitate, situations with the following characteristics:

- Delivery of a financial product structured around the crop season and designed to ease cash flow constraints throughout the season.
- Well-organized farmers in group who have been, and are, receiving training and extension services.
- Strategic partnerships supporting the target group to access inputs.
- GIS maps and household profiles giving Opportunity insight into the household requirements and cash flow pressures.
- Total farm plan with a range of food and cash crops.
- Price risk mechanisms – contracted production and marketing.
- Household safety nets with weather indexed crop insurance and credit insurance.

With the assistance of The MasterCard Foundation and the Bill and Melinda Gates Foundation, Opportunity Bank embarked on an ambitious loan program in five countries. They started out in Malawi in 2009, rolling out into Ghana and Uganda in 2010 and adding Rwanda and Mozambique in 2011. Since the start of the program a total of 99,225 agricultural loans averaging less than \$500 have been disbursed. These loans are almost all managed under the group lending method, where the group stands surety for the individual members. The loans were all embedded in supply of agricultural finance

to defined value chains where improved production recommendations are available and demand for the final product was high.

Each crop has its own unique production and marketing potential and challenges within the specific local context. As a result, the loan products offered needed to be tailored to local needs and opportunities.² Opportunity has endeavored to spread the risk over as wide a variety of commodities as possible, but in many cases the absence of good partners has made this difficult. The current loan portfolio is still highly dominated by a few commodities – sugarcane, cocoa, and tobacco – making up 90%, 78%, and 78% of the loans in Uganda, Ghana, and Malawi respectively. This study included these key crops as well as additional ones in the three countries. The following paragraphs present the crops investigated in this study and a brief summary of their broader contexts:

Malawi, Tobacco: Tobacco is the main traditional cash crop in Malawi and a major foreign exchange earner for the government which closely regulates the production and marketing. It is the main source of livelihood for the majority of farmers in Malawi. The large international tobacco companies hold significant economic and political power. Tobacco yields fell seriously after the government removed fertilizer subsidies under pressure from the World Bank in the 1980's. In recent years, rather than increase the price of tobacco the government has decided to subsidize fertilizer again. But even at the subsidized price most small farmers lack cash to purchase inputs at planting time. Therefore, the tobacco companies link organized farmer groups to banks such as Opportunity for loans to purchase inputs. In Malawi, the bank is working directly through these tobacco companies that deliver inputs, train farmers, and purchase the output on contract. The loan package also includes improved seed and fertilizer for maize, which is the staple food crop. While tobacco yields have increased under this arrangement, the depressed prices and rising cost of living limits the benefits to farm households, especially in the last couple of years when Malawi has been facing serious inflation, currency devaluation, and food shortages. But without the fertilizer, farm households would be truly desperate.

Macroeconomic Factors. The tobacco buying market in Malawi is heavily regulated through chartered associations and a handful of licensed bulk-buyers. While the annual prices are determined through an open auction system, run by the Auctions Holding Company, the leverage that the bulk-buyers enjoy in off-taking, has inadvertently established a pricing mechanism unfavorable to the farmer. The dominance of a handful of international buyers - having access to the international markets and capital - playing the role of price makers, has caused a crowding out of smaller players from the market. The tobacco market in Malawi is denominated in US\$ and has been a key source of foreign exchange for Malawi; however the sector has not produced sufficient inflows to allow the country to meet its Balance of Payment needs. The resulting fluctuations in the value of the currency have caused additional distortions in the market to the detriment of tobacco farmers. With the country finding it hard to meet its oil bills, the value of the Kwacha had weakened since 2010. More recently, however, Malawi has experienced a build-up of foreign exchange reserves from the IMFs, resulting in a significant appreciation of the value of the Kwacha. This makes Malawi's tobacco more expensive on the world market, hurting the farmers substantially. High inflation is also causing secondary price increase impacts. This coupled with the instability in MKW/USD rates has introduced uncertainty for the producers, and diminished confidence in the tobacco crop.

² The specific terms and conditions of the loan products for each of the crops under this study are presented in detail in Annex 4.

Malawi, Soybeans: Soy is a relatively new commodity with an up and coming market demand. In 2012 Opportunity partnered with private wholesaler interested in the crop. The wholesaler organized the farmers, supplied the inputs and extracted payment of the loan in kind from the final sale of the harvest but did not provide extension training. There is, however, evidence of insufficient oversight by the partner. Seed was delivered late and the crop suffered from water stress because of late planting. The communication with the farmers seems to have been insufficiently clear with respect to the terms and conditions for the in-kind repayment, so that farmers felt that repaying three times the seed supplied³ was unfair. At the time of harvest the farmers lacked market alternatives, although new potential markets have now been identified that the farmers association is exploring. Many of the farmers defaulted. This is an example of the high level of intermediation risk the can occur when there is a weak partner.

Malawi, Groundnuts: Groundnuts is another cash crop that farmers who are unhappy with tobacco are trying. The private sector intermediary for groundnuts was much better organized and the wholesaler provided demonstrations and training through lead farmers. Market demand at harvest was fair. The value of the loans was very small however, consisting only of 10 kg of improved seed, so total impact on households was small.

Ghana, Cocoa: Cocoa is the main cash crop in Ghana and like tobacco is highly regulated by government. But unlike Malawi, the private sector companies are less well entrenched and less vertically integrated – primarily because the government buys all the cocoa through licensed buyers and then sells it to the exporters. Profit on cocoa trading is a major source of government revenue.

Cocoa is a tree crop that takes 4-5 years to produce its first crop, but then continues to produce twice a year for up to 60 years. Most farmers have inherited their cocoa farms, and there are a lot of older farmers among the cocoa groups. Strong NGO partners are promoting improved production practices but with a perennial the results take long to be seen. The new hybrid varieties need at least five years to come into production, and 10-15 years for the tree stock to reach its full bearing potential. Similarly to optimize the returns to fertilizer use requires 3 years of consistent application, yet loan products must be repaid after the first harvest and not all farmers stay with the program for the full three years. The government subsidized fertilizer is inevitably released late, distorting the supply chain and creating opportunities for hoarding and price manipulation by input suppliers, and introducing price risk for the bank.

Cocoa productivity is largely rainfall dependent. 2011 was an excellent year for rainfall and use of the recommended inputs produced a bumper crop for participating farmers. But in 2012 the rains were inadequate in some areas and the first harvest largely failed making it difficult for farmers to repay their loan on time and still meet household living expenses. The farmers were able to cover the loan from the minor harvest several months later, but late payment has a ripple effect with some groups then not able to qualify for the next season's loan or receiving their inputs late.

³ Oftentimes, farmers do not clearly understand the difference between seed and grain. Under the terms of the loan the farmer was to repay 3 kg of grain for every kg of seed obtained on loan. Given the significantly higher cost of seed, if the relative prices at which the seed was supplied and the grain bought back from them was more clearly communicated and documented, this might not have been an issue.

Ghana, Maize: A strong partnership has been forged which includes input supply, extension support and links to market off-takers who offer more favorable prices and buy the produce by weight rather than in bags. Where the NGO is directly involved in supporting local collection centers farmers are especially happy with the situation. Unfortunately, the poor rains in the main season of 2012 constrained yields and about 60% of the farmers had to repay after the minor season harvest.

Ghana, Onions and Chilies: Horticulture production is expanding rapidly in response to high market demand. There is no specific partner for these crops. The Opportunity loan officer is providing the extension advice, and small-scale traders offer marketing services based on a trusted relationship with their suppliers and customers. Loans are facilitating expansion of production through increased acreage under irrigation, expanded land opening and rental, and improved access to cash to buy inputs and hire labor. As a short season crop, horticulture is relatively easy enterprise for younger farmers to get involved with. There is very high demand for the loans, and solidarity of the groups is excellent.

Uganda, Sugar: Agricultural policy in Uganda is completely pro private sector. There are no marketing boards or input subsidies. In 2011, Opportunity identified the potential for collaboration with a new entrant to the sugar industry that was interested in establishing a major out-grower scheme in Eastern Uganda to supply cane for its new processing facility. Sugar cane is a long growth cycle crop. It takes 18 months to reach maturity for the first harvest. The crop is then cut and regrows from the existing root stock. This ratoon crop is ready to harvest after 12-14 months. In total, the cane can be harvested four times over a period of 5-6 years. The biggest investment is required at the stage of initial establishment when the costs of seed cane, land clearing and planting exceed the capacity of most small farmers. Unfortunately, while the demand for sugar continues to push the price of cane upward, the partner company had not completed installation of the factory by the time the first sugar loans came due. While the crop can stay in the field for an additional 6 months before it starts to deteriorate, this imposed a short term hardship on the farmers who had to find other means to repay the loan and faced serious cash flow difficulties in meeting household expenses due to the delayed harvest. In order to sell to other sugar factories they would have to get a cutting permit, wait their turn to harvest, and cover the higher cost of transport to the far distant processing site. The long term potential for this crop is excellent, as the factory is scheduled to double in size over the next 5 years. The current marketing problem is a transitory issue.

Uganda, Coffee: Coffee is another tree crop and was historically the largest foreign exchange earner for Uganda. Coffee production has faced a serious decline in recent years due to falling soil fertility, coffee wilt disease, and the coffee borer pest. Many of Uganda's aging coffee plantations are overdue for replacement. While new hybrids that are disease resistant are available, small farmers find it difficult to forego their normal revenue for several years while waiting for a new plantation to come into production. Working with collaborating NGO and private sector farmers, Opportunity Bank has been injecting loan financing into the coffee sector to rehabilitate existing plantations, and encourage investment in replanting. Working in collaboration with local cooperatives, finance is assisting farmers to access fertilizer to increase productivity of existing plantations, and enabling them to meet household cash needs at the time of harvest so that they can improve their negotiating power, add value to the crop by selling hulled coffee beans rather than whole berries, and resist the temptation to sell the coffee while it is even still on the tree. Improved links to fair trade exporters holds promise for better coffee prices in the future. Climate change, however, is one potential future risk whose impact is yet unknown. Some sources predict that rising temperatures could seriously threaten coffee production in many parts of Uganda.

Coffee Production and Pricing. Evidence comparing prices on the international and Ugandan wholesale markets over five years, reveals the essential role price stability plays in ensuring maximum impact of loans on the lives of coffee farmers. Analysis of prices shows a contraction in export parity in 2009, and a recovery between 2010 and 2012. Good seasons when demand is high and prices attractive, as experienced in 2011 and 2012 encourage farmers to invest in expanding production and increase the demand for credit. In contrast, coffee production seasons affected by harsh climatic conditions, pests or diseases (Coffee Wilt Disease) result in low production, supply shortages and price spikes locally. This diminishes the profit margin for exporters, and disrupts demand from international coffee buyers who look to other producer countries for assured supply at attractive prices. Most recently, the winter crop in 2013 in Masaka, Uganda has been affected by excessively hot weather and pests and we should expect the export parity for Coffee to shrink through 2013. The Opportunity Bank in Uganda is working closely with farmers to adjust loan terms and match their cash flows to adjust for the poor production last season. This shows Opportunity's ability and willingness to take on extra risk to smoothen income shocks faced by farmers in lean production seasons.

Uganda, Maize: Maize is short-maturing and primarily grown as a food crop, although significant quantities are marketed and exported from Uganda into the wider East African region. There is no organized market for maize in Uganda, and this poses a potential threat to loan recovery. In Kyenjojo, farmer groups organized to produce maize and other staple crops are therefore encouraged to repay their agricultural production loans on a monthly installment basis, out of proceeds from other businesses. Each group is allowed to organize their own access to inputs. Group members may also use the loan to produce Irish potatoes, bananas, beans, or groundnuts; but interest in producing maize is increasing as a result of the loan opportunity and increasingly farmers are producing pure stand crops rather than intercropping. No strong partner exists to provide extension support services in this area.

Uganda, Cotton: Cotton is another traditional cash crop in Uganda, but production has been declining seriously since the demise of the cotton marketing board and privatization of the sector. One of the first partnerships for Opportunity in Uganda was with a newly re-organizing cotton ginnery in Eastern Uganda that offered to supply inputs and contract for marketing. A strong NGO partner initially provided extension support, but that project has since ended. Unfortunately, in the first year the international market for cotton collapsed. The final price offered was less than half of that expected by the farmers when they took the loan. This discouraged many farmers. Some groups switched to growing maize or rice the following year.

In Summary: Clearly there are significant challenges in trying to provide agricultural financing under such conditions. The overwhelmingly positive assessment of the loan program by the survey respondents, therefore attests to both the desperate need of the smallholder farmers and the care and effort that Opportunity has invested in tailoring the products to local conditions and responding proactively to the situation on the ground.

Additional details of the terms and conditions for the agricultural lending to these commodity value chains and the challenges they face are provided in Annex 4.

1.1. Methodology

This document reports on the results of an assessment designed to investigate the impact of the program on the lives and well-being of the Opportunity International agricultural loan recipients.

The key question in designing an appropriate research instrument is the following: "Given a set of information objectives on the one hand, and constraints such as time, money and expertise on the other, which combinations of qualitative and quantitative approaches will be optimal?" Marsland et al. (2001) point out that "the value of information depends on its trustworthiness. Here it is proposed that the trustworthiness of information will be increased if quantitative and qualitative approaches to data collection and analysis are combined rather than used separately."

This study made use of a number of approaches in order to gather quantitative and qualitative information to gauge the program's impact, triangulate the data and provide meaningful findings. The primary approaches used included the following:

1. Literature review and development of a value chain analysis for the three major crops.
2. A client survey to analyze the experience, perceptions and attitudes regarding the impact and effectiveness of the agricultural lending intervention; with the same data collected for a matched control group.
3. "Content analysis" of open-ended questions regarding the "most significant change" resulting from the credit.
4. Key informant interviews with farmer clients, bank staff, and market stakeholders.
5. Focus group discussions with clients.
6. Collection of quantitative data available from bank and ESP⁴ records – including transactional and farmer tracking data that might offer insights into farm productivity and income changes.

Value Chain Analysis

Value chains encompass the full range of activities and services required to bring a product or service from its conception to sale in its final markets. Value chains include input suppliers, producers, processors and buyers. They are supported by a range of technical, business and financial service providers.

In order to better understand the needs and risks of the various commodities it was necessary to understand the value chains that have grown up around each one in their respective contexts. As part of this study, value chain analyses were prepared for tobacco in Malawi, cocoa in Ghana, and coffee in Uganda based on secondary literature review. These papers provided background information needed to contextualize the analysis and inform our understanding of the issues affecting loan performance and household wellbeing. These reports are available on request.



⁴ Opportunity Banks in all three countries have partnered with NGO and private sector Extension Service Providers (ESP) to train farmer clients on Good Agricultural Practices (GAP).

Individual Respondent Survey

The study used a multistage stratified sampling approach to collect information from loan beneficiaries and control farmers producing three or four major crops from the loan profile in each of three program countries. By making use of cluster sampling we significantly improved the cost effectiveness of data collection while still maintaining probability sampling. The corresponding decrease in cost more than makes up for the loss of reliability. It also creates a way to establish probability sampling when a complete element-specific sample frame is absent. The sampling procedure agreed upon was as follows.

Stage 1: Country selection: Out of the 5 participating countries involved in the agricultural lending program, Malawi, Uganda and Ghana were selected purposively for the study in discussion with Opportunity International.

Stage 2: Commodity Selection: Based on an analysis of the loan portfolios from the three selected countries, three locations and three commodities were purposively selected from each country. These commodities were selected because they represent the largest proportion of loans in the portfolio. Similarly, the particular branches that have concluded the largest number of agricultural loans for these commodities were chosen. Based on the number of completed loans for these commodities/locations a target sample size sufficient to provide results with a 95% confidence level that is within a +/- 10% margin of error was agreed upon in consultation with Opportunity International.

Stage 3: Group Selection: Based on a sample frame of all completed loans for the selected commodities and selected locations, a sub-sample of farmer groups was selected purposively in order to cluster the largest possible number of potential clients in a limited number of locations. The farmers groups were arranged according to number of completed loans per group (with individual borrowers counted multiple times according to the number of completed loan cycles) and the largest ones selected.

Stage 4: Respondent selection: The group members were divided into a male and female sample frame per location. From each sample frame, the desired number of respondents were selected using systematic sampling from a random start. This resulted in a random sample of men and women who were invited for interview.

Client farmers – identified in the manner described above – *had to have received and completed at least 1 cycle of agriculture loans from Opportunity during the period 2009-12*. Since the research sought to measure the change between 2009 and 2012, new Opportunity loan clients who had started their first loan cycle in the 2012 or 2013, but not yet harvested the crop in question, were not considered Client samples. Thus, Client individuals could range anywhere between those who had finished 1 to those who had finished 4 loans. The research itself would eventually reveal further characteristics, including the financial behavior, of the individuals in this group—but at the outset no additional characteristics were used as filters in selecting respondents.

Stage 5: Control sample: Because we were interested in comparing Client farmers with others who worked similar crops in the same area and in roughly similar soil and climatic conditions, we identified a Control group by choosing farmers from the same vicinity as sample borrowers. Control farmers were identified by the collaborating partner organizations from among non-recipient farmers in the same vicinity as the sample of borrowers. Many of them were either newly recruited group members or acquaintances

of members of Opportunity farmer groups. The key requirement was that the Control farmer *had not received an Opportunity agriculture loan during the 2009-12 period.*

As this suggests, the sampling methodology for the control farmers was not a true “random” sampling. However, it was hoped that this would successfully capture the type of farmer who worked similar crops under similar conditions and could, in theory, be considered for Opportunity loans but had not yet received and completed any by 2012. Findings from this research will show that this assumption was correct.

As it turned out, about 20% of the control sample had recently received Opportunity loans for the coming 2013 season. It is recognized that the control farmers cannot be assumed to be a true "random"⁵ sample of all farmers, but should be representative of the type of farmers who could in theory be considered for Opportunity loans but had not yet benefitted during the 2012 production season. The fact that they have access, albeit limited, to alternative sources of credit, inputs, extension advice and market linkages is reflective of the reality on the ground. This makes them an appropriate basis for comparison to realistically assess the impact of the Agricultural Credit Program. Opportunity does not provide services in a vacuum. Its potential clients have other possible service providers from among which they must choose. The better off, in the community, especially the more educated with resources they can offer as collateral do have some options for credit and services. It is the vast majority of the smallholder clients who cannot afford to access them who benefit most from Opportunity's intervention.

Table 1. Summary of Planned Sample and Completed Surveys

Location	Crop	Planned Sample Size	Planned Control Size	Achieved Sample Interviews	Achieved Control Interviews	Sampling Methodology
Uganda						
Iganga	Cotton/maize	77	30	75	37	Stratified Systematic Sampling
Iganga	Sugarcane	61	30	34	36	
Kyenjojo	Maize	77	31	83	37	
Masaka	Coffee	69	30	69	30	
Malawi						
Dowa	Groundnuts	88	30	85	43	Stratified Systematic Sampling
Dowa	Tobacco	30	17	30	14	Area Sampling
Kasungu	Tobacco	87	35	107	41	
Ntchisi	Soya	88	35	58	38	
Ghana						
Kejetia	Cocoa	146	38	157	47	Stratified Systematic Sampling
Techiman	Maize	78	31	84	25	
Ashaiman	Onion/Chilies	74	30	85	29	
Totals		875	337	867	377	

⁵ The limitations this poses to the study are discussed further in section 1.2 on descriptive statistics, and in section 4.1 of the conclusions.

Logistical arrangements varied by country. In Uganda, farmer groups were asked to meet at their usual meeting point in their own community. The team of enumerators then went to them, with directions and introduction provided by the Opportunity Field Staff. In Ghana, because of the significant distances involved, it was decided that all of the respondents from a given location should be invited to meet at a common meeting point close to where they normally do their banking. The respondents were assisted with transportation arrangements. In Malawi, respondents from various clubs in a given location were requested to come to specific cluster centers.

The variance between planned sample size and achieved sample is explained by a number of factors. First of all, respondents were invited to come to a specified meeting place. Some of the invited respondents failed to show up and were replaced with other group members who came to participate in the focus group interviews. Especially when the interviews were held in a number of different locations, it was not possible to determine in advance how many respondents would turn up in each location. So in some cases, additional interviews were conducted just to make sure we achieved the target numbers. In Iganga, Uganda, because the sugar factory did not come into production as planned, most borrowers had not completed their first loan. It was therefore impossible to locate the target number of respondents. Similarly, because of the large number of defaulting soybean borrowers, it was very difficult to get clients to agree to be interviewed.

One of the challenges facing this study is that baseline data was not collected during the initial course of the project implementation. In this context, this study therefore sought – as much as is possible – to retroactively reconstruct a baseline on the basis of the client perception survey. Another difficulty is the fact that respondents participated in one or more loan cycles over the past 4 years.⁶ The survey therefore asked respondents to compare the situation now with that of 2009 before any of the loans were issued (a before and after analysis). This information was collected for both borrowers and control farmers in order to enable a with-and-without intervention analysis.

The survey tool that was designed makes considerable use of rating scales/scoring techniques. These approaches are useful in establishing people’s perceptions on a given issue. The tool establishes the direction and magnitude of change and also seeks to document the strength of conviction from the respondent. Quantitative recall data were collected on production practices, yields and quantities



⁶ On average clients had received 1.67 loans each. The distribution of clients surveyed who received Opportunity loans in the respective years was as follows. This is representative of the increasing loan portfolio over time. Most loans for 2013 had not yet been approved at the time of the survey. The sample frame for clients included only those with at least one completed loan cycle. All clients with loans in 2013 also had at least one prior completed loan.

Year	2009	2020	2011	2012	2013	n=
% of clients with Loans	4.1%	12.3%	47.1%	75.5%	16.6%	822

marketed. A summary matrix of the data collection and analysis tools designed to answer each of the questions in the TOR is attached as Annex 2.

Focus Groups and Key Informant Interviews

The Individual Respondent Survey was supplemented by Focus Group Discussions and Key Informant Interviews. These were conducted to provide a qualitative context for the results of the survey, and to verify and triangulate the information. The Focus Group Discussions were conducted with farmers while they were waiting for their turn to be interviewed. This helped to keep them engaged and avoided the problem of people losing patience and leaving before they could be interviewed. Some of the key informants came to the places where farmers were being interviewed. Others were interviewed either at the local bank branch or at their respective places of business. A data collection checklist was used to guide these interviews, but considerable flexibility was encouraged in order to follow up on interesting information and insights as it emerged.



The number of qualitative interviews conducted is summarized in the following table. The contact list of key informant respondents is included in Annex 3.

Table 2. Focus Groups and Key Informant Interviews

Country	Location	Crop	Planned		Completed				
			Focus Group	KII*	Focus Group	Input supplier	Off taker	ESP	Bank
Uganda	Masaka	Coffee	2	4	2	2	2	1	4
	Kyenjojo	Maize/Irish	2	4	2	1	0	3	2
	Iganga	Cotton/maize	2	4	1	2	1*	0	1
		Sugar	2	4	0		2*		
Malawi	Ntchisi	Soy	2	4	2				1
	Kasungu	Tobacco	2	4	1		3*	1	1
	Dowa-Mponera	Groundnuts	2	4	1		1*	1	1
		Tobacco	2	4	1		1*	1	
Ghana	Techiman	Maize	2	4	2	1	1	1	2
	Kejetia	Cocoa	2	4	2	2	1	3	3
	Ashaiman	Onion/Chilies	2	4	2	0	2	1	1
Total			22	44	17	8	14	12	16
<p>** The expectation was to conduct at least one interview of an input supplier, extension services provider, off taker, and bank staff in each location.</p> <p>* In the case of cotton and sugar in Iganga and tobacco in Malawi, the off taker is also the supplier of inputs and extension advice.</p>									

Value Chain Document Review and Interviews

In addition to the survey, focus groups, and key informant interviews, this research undertook to seek out any documentation that the bank, ESP, input supplier, or off taker might have that would help provide further data for understanding the impact of the project on farmer outputs. The particular focus of this exercise was to find available documentation, collect data that would provide quantitative, time-series data. The team worked closely with Opportunity staff at the banks to scour for all possible bank documentation that would have the potential to provide evidence on farmer household yield and income changes. But not all records proved useful. In the end, the research did find farmer group books (supplemented by farmer interviews for filling data gaps), bulk buyer receipts, and ESP records from which they could mine information on some crops in certain locations. Efforts were made to review farmer group record books—maintained by the group secretaries in most cases often to fulfill reporting requirements to loan officers. Interviews – separate from the focus group and survey interviews noted above – were conducted, in the presence of enumerators, to ensure that the data given by the farmers were consistent and reliable to the best extent possible. The nature of the documentation reviewed and their usefulness for the impact study is noted in the table below.

Table 3. Value Chain Document Review and Data Relevance

Country	Alternative Data Source	Level of success with finding relevant data
Uganda	Paper based loan appraisal forms	Checked loan appraisal forms in Iganga and Masaka. The forms were partially filled, with incomplete information. In most cases the forms only included the basic KYC data while only a few had additional data on area and past production. Developing a time series data set from the forms was impossible.
	Electronic loan appraisal forms	This is a new initiative started in 2012 by the AgFinance manager, whereby loan officers report loan appraisal data in Excel spread sheets on a quarterly basis. The data was complete in providing information on land acreage, crop production during previous season and sale prices. However, it will take more time for the source to provide meaningful time series data.
	GPS land mapping and household profiling data	While there were relevant data fields available in the form, data for only about 300 has been collected in Q2-2013. Time series data on farmers was unavailable.
	Farmer Group Books	Farmers' group secretaries maintained information such as acreage planted by each member, output market through the group, and expected production for next season. This information for mainly maintained for applying for the next season loan. This source provided the bases for the alternative data collected, supplemented by direct farmer interviews for filling data gaps.
	Buyer receipts	Some groups maintained buyer receipts. These were used to calculate the quantity marketed by each farmer in the group, then later validated by the farmer.
Malawi	Paper based loan appraisal forms	Did not exist.
	GPS land mapping and household profiling data	Did not exist.
	Auction receipts	In the case of Malawi, both the ESPs and the farmers maintained auction receipts for records. A stack of receipts were taken from Alliance One, for farmers with Opportunity loans in Kasungu, to explore collecting quantity and price information on the tobacco auctioned by each farmer, but the receipts were incomplete. Alliance One was then requested to provide a complete listing, which they informed will need to be accessed from AHC, Auction Holding Company (the national auction company), but the data is still awaited.
	Group farmers	In the absence of secondary sources, the group farmers were interviewed to gather time series data.
Ghana	ESP records	The Millennium Village Project and Technoserve provide data on inputs usage, farmer production and land acreage.
	Bulk buyer passbooks	Buyers and sellers receive credit from the COCOBOD (govt. regulator) in Ghana, when sales are reported. Buyers issue passbooks to farmers, in which they record purchases from the farmers, evidence which substantiates transactions to COCOBOD. Effort was made to access production and sale price data from farmer passbooks, but the farmers informed that all transactions were not being reported in passbooks, and hence the data was incomplete.
	Group farmers	The primary sources of data in Ghana were the records gathered from the ESPs. However farmers from one group in Ashaiman were interviewed for gathering additional time series data. The farmer recall was observed to be weak in this case alone, and the farmer given data is unreliable for Cocoa.

These findings offer case studies on groups of client farmers and non-client farmers—looking systematically at their land size, production, and sale numbers. The findings, where relevant, have been incorporated into the body of this report. A separate discussion of this can be found in Annex 11.

Assessing Impact on Income

Estimation of household income in societies where formal sector employment is rare and household cash flows from both agricultural and non-agricultural sources are highly variable throughout the year is notoriously difficult. This further complicates the collection of information that is sensitive in any culture and generally highly subject to either over- or under-reporting. Moreover, assessing income requires accurate assessments of total amounts of crops brought to market, how much is brought when, and the market prices that the farmer received for that particular quality of crop on that day. This may be feasible for some crops such as cocoa in Ghana or tobacco in Malawi where prices are controlled by the government and the crops tend to be brought to market in bulk. This may even be possible with certain crops where a stable market has developed for a crop in a region such as maize in Ghana—where a certain stability of price can be seen and can be researched by looking at their books. But as noted earlier, this is considerably more difficult with crops where harvesting, drying/storing, processing, and/or marketing can all take place at different times and the market is more fragmented.

In addition to these practical challenges, there are two research challenges:

1. If the interest is in seeing what the differences are between project clients and non-client (comparison) farmers, focusing on incomes is only partially helpful. To be sure, if the project facilitated access to processes to clients but not to non-clients, one could expect to see significant differences in incomes. However, on the whole, since comparison farmers often came from the same groups as Opportunity's client farmers, non-client farmers were receiving similar processing and marketing services as client farmers. In many cases, Opportunity's value chain facilitation work helped them no less than clients. Even so, this research has shown that Opportunity provides services that make a difference. But the difference may not be in the different market prices that client farmers get in contrast to non-client farmers.⁷
2. If the interest is not so much in comparative analysis but in seeing changes in farmer livelihood status based on income, even if the information noted above was available and fully gathered, it would not be sufficient. One must factor in inflation, the regional prices of essential goods and services, and then gauge the significance of the change in incomes. The study of incomes and the actual purchasing power, then, naturally moves us toward a more macroeconomic study. Even if this were done, it still would not achieve an understanding of the actual changes the farmer experienced by actually using his/her income.

⁷ One exception to this may be if Client farmers could get different prices from non-client farmers because of the different crop quality.

For the purposes of this study—which sought to look at changes in farmer livelihoods—a more efficient way was to research the actual changes they experienced in assets, consumption, and service access patterns to get at the total impact on their livelihood status. This allowed the research to sidestep the practical challenges involved in asking income questions that were sensitive or susceptible to withholding or to exaggeration by the respondents. It also allowed us to get at the impact on livelihoods without adding a complex macroeconomic component to the research.

It was important, therefore, to use good proxy measures to get reasonably reliable information in place of income. For this reason, the survey tool elicited data on the following proxy income indicators:

- a. Asset ownership: accumulation of productive assets like land/livestock/productive equipment, and household assets.
- b. Ability to meet basic needs (perceptions of the households' ability in 2009 which is the base year and change in ability since then).
- c. Quality and quantity of businesses—including number and importance of household income sources, and acreage/size of enterprise, and use of modern inputs for agricultural production.

The survey also collected information needed to be able to calculate the Progress out of Poverty Index (PPI) which is a standardized index indicative of household income, wealth and well-being. This index is described in greater detail, and the results analyzed in Section 9 below.

Considering Gender and Age

Gender is viewed as a cross cutting theme in this study. Focus group discussions entailed a considerable emphasis on the implications of gender and age on roles and responsibilities in agricultural production and access to finance. Attention was also paid to ensuring that a representative sample of female borrowers be included in the respondent survey. Given that a significant proportion of the Opportunity Bank borrowers are female, this creates a valuable opportunity to assess the impact of agricultural loans to women on their level of well-being and empowerment within the household. For this reason a set of questions about decision-making in the household was included in the survey instrument. These questions measure who makes various decisions on aspects of production now, and compares it with who used to make those same decisions in 2009. In addition, the analysis of other variables in the report has been disaggregated by gender of the borrower, in order to identify any significant differences. Further discussion in addition to gender analyses that has been mainstreamed into the text, can be found in Section 2.4.

1.2. Description of the Client and Control Populations

In general, Opportunity International's agricultural borrowers are small-holder farmers producing at least one commercial crop. Their income is generally just barely adequate to meet their basic needs. They are not the poorest of the poor, but they are generally too small to be of interest to financial institutions as individual borrowers. They are organized into groups by crop, and the group members guarantee each other. Their loan is partially secured by a mandatory savings deposit (10 to 15%) that can be used to offset default on the part of individual members. In Malawi (for tobacco farmers) and in Ghana the account is held in the group's name whereas in Uganda each individual has a security account in addition to their regular savings account.

There are more men than women in the groups because in these cultures men still have greater access to land and resources and are considered to be the head of the family. Women constitute 32% of borrowers in Ghana, 33% in Malawi, and 22% in Uganda. A large proportion (35%) of the women borrowers tends to be female heads of households with dependents. Others are married women, although in most locations the groups discourage husband and wife from both being members of the same group as it is considered risky to the group. Single men constitute only 4% of the male clients.

The average age of the Opportunity borrower is 45 years for both men and women, but age varies significantly by commodity. Most of the perennial crops (coffee and cocoa) and traditional cash crops (cotton) are grown and controlled by older farmers, while young farmers find it easier to get involved in short season crops with rapid turnover (chili, onions, groundnuts). Many of these younger farmers are



producing on rented land because they do not have enough of their own land. Less than 3% of the clients interviewed are under 25 years of age. Lack of land and collateral, are major constraints for youth in Africa, most of whom are interested in income generating activities that can turn a profit faster than agriculture.

Table 4. Age Distribution of Borrowers by Gender		
Age category	Male Borrowers	Female Borrowers
Youth (35 and under)	21.0%	26.3%
Middle (36-59)	63.7%	62.3%
Older (60 and over)	15.3%	11.4%
Average Age	45.9	44.4
Proportion Under 25	2.3%	2.6%
n=	642	228

Table 5. Average Age Distribution of Borrowers by Crop and Gender			
n=870		Male	Female
Uganda	Coffee	50.5	47.0
	Cotton	49.7	45.8
	Maize	43.8	43.5
	Sugar	46.4	43.3
Malawi	Soy	50.5	45.5
	Tobacco	41.0	41.4
	Groundnuts	41.8	40.2
Ghana	Chili	40.6	38.9
	Cocoa	50.3	49.5
	Maize	48.0	48.3
	Onion	40.9	41.1
Overall		45.9	44.4
	n=	642	228

Education levels are relatively low, and even lower for women than for men. Three in every four (75%) men have primary or junior secondary level education, while 71% of the women have either not attended school, or have only primary school attendance.

On average the respondents have access to 6 (mode) to 9 (mean) acres of land and grow 2.5 (mode) to 4.2 (mean) acres of the priority crop. Average acres planted are much higher for sugar (16.6) and cocoa (9.4) and least for groundnuts (1.1).

Annex 5 presents a further breakdown of basic household descriptive statistics by country, crop, and gender.

Access to Credit

As explained in the methodology, the primary criteria used for selecting control households were:

- That they be engaged in producing the same target crops as the clients,
- That they be farming in the same geographic area so that soil and climate conditions would be comparable.

- *That they had not received an Opportunity agriculture loan during the 2009-12 production period.*

It must be noted, however, that choosing those who had not received Opportunity loans did not necessarily mean choosing those who had not received any loans at all. In theory, Control farmers could avail themselves of alternative credit, inputs, extension services, and market linkages should such opportunities and services exist. As it turned out, a minority within the comparison group did in fact avail themselves of such services—about 10% of the control sample had recently received Opportunity loans for the coming 2013 season, but more importantly, another 10% had received loans from other financial institutions during the 2009-12 period.⁸

The choice of such a Control group was both practical and theoretically important. Without sufficient prior understanding of the financial lives of comparison farmers, it would have been tremendously difficult to plan a study that could effectively exclude respondents with any previous credit history. But it was also a question of the research question we wished to answer. We wished to accurately assess the impact of the agricultural credit program under realistic conditions. Opportunity does not provide services in a vacuum. Its potential clients have other possible service providers from among which they must choose. The better off in the community, especially the more educated with resources they can offer as collateral, do have some options for credit and services. It is the vast majority of the smallholder clients who cannot afford to access them who benefit most from Opportunity's intervention.

Recognizing that the control group was not actually randomly selected, and that some might have had prior access to credit, a comparison analysis was conducted to test for statistically valid differences between the control and client groups as they were in 2009. There was no evidence of systematic bias. As expected, both samples present with a normal distribution of individuals from the poorest to the more wealthy with the majority clustered around a point of central tendency on each of the various indicators. The controls are neither significantly poorer nor wealthier than the clients. Some of these results are also presented in Annex 5.

⁸ Further detailed analysis of utilization of financial services is presented in the following section.

2. Findings

2.1. Utilization of Financial Services

From the perspective of the Bank, the Agricultural Finance project has enabled Opportunity to position itself strategically to better achieve its overall mission⁹ and to provide vital financial services to the majority of potential African clients in its catchment countries. Key bank personnel clearly highlight the importance of the MasterCard support in expanding the network of service points¹⁰, significantly increasing the number of clients served and positioning the bank to offer cutting edge products and services designed to improve financial access and reduce costs and risks to the bank of such service delivery.

A brief summary of the achievements is as follows:

Results as at March 31, 2013:

Loans:

- Disbursed 99,225 agricultural loans to farmers, totaling \$21,125,423 in loans¹¹
- 184,001 total outstanding loans for both agriculture and non-agriculture

Targeted Savings Products:

- Total Active Rural Savings Accounts: 556,416
- Total Active Savings Accounts: 1,322,473

Evidence from the survey clearly shows that access to finance is greatly facilitated by the agricultural loan program. While 100% of the clients had borrowed money from Opportunity Bank, of the control group only 20% of the control group had been able to borrow any money from any MFI or financial institution in the last four years and of these loans roughly half were actually recent loans received from Opportunity for the coming season in 2013.¹² Surprisingly almost no loans from money-lenders were reported. This may have been a problem in interpretation of the question, and bears keeping in mind. The data also fails to capture credit received in the form of advances against produce sales obtained from buyers—which is the most common way that poor farmers get access to cash to meet household needs during the periods of cash flow crises. Both credit from money-lenders and advances from buyers tend to be highly exploitative.

⁹ **Opportunity Bank's mission** "is to empower people to work their way out of chronic poverty, transforming their lives, their children's futures and their communities." (<http://www.opportunity.org/about/our-mission-and-vision>)

¹⁰ Thanks to the MasterCard support, these three banks have opened 27 new branches and 11 kiosks, and operate 12 additional mobile banking vans that offer banking services to more than 50 communities.

¹¹ By June 30, 2013, the loan figures had risen to 125,001 loans totaling \$29,400,001.

¹² Because the crops for these loans had only just been planted, they did not affect the productivity results for 2012. A detailed breakdown of sources of credit to control clients is presented in Annex 6.

As seen in the pie charts below, nearly half of the Opportunity clients had received more than one loan in the past four years, as compared to only 5% of the control households.

Figure 2. Number of Loans Received by Opportunity Clients in Last 4 Years

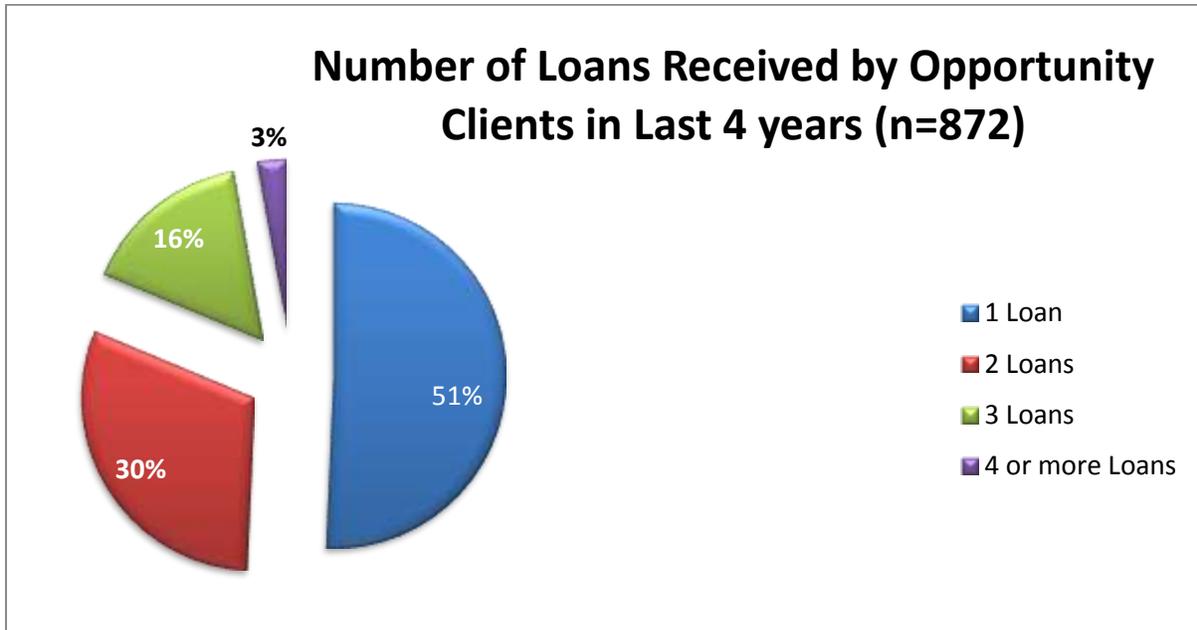


Figure 3. Number of Loans Received by Control Respondents in Last 4 Years

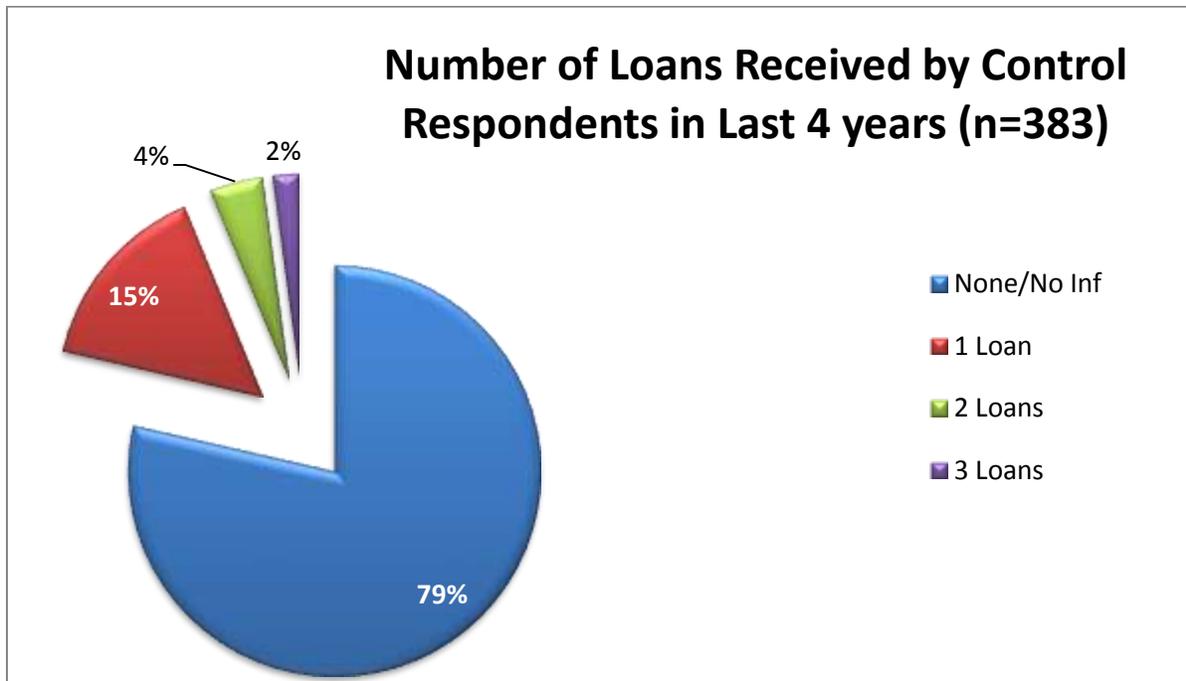


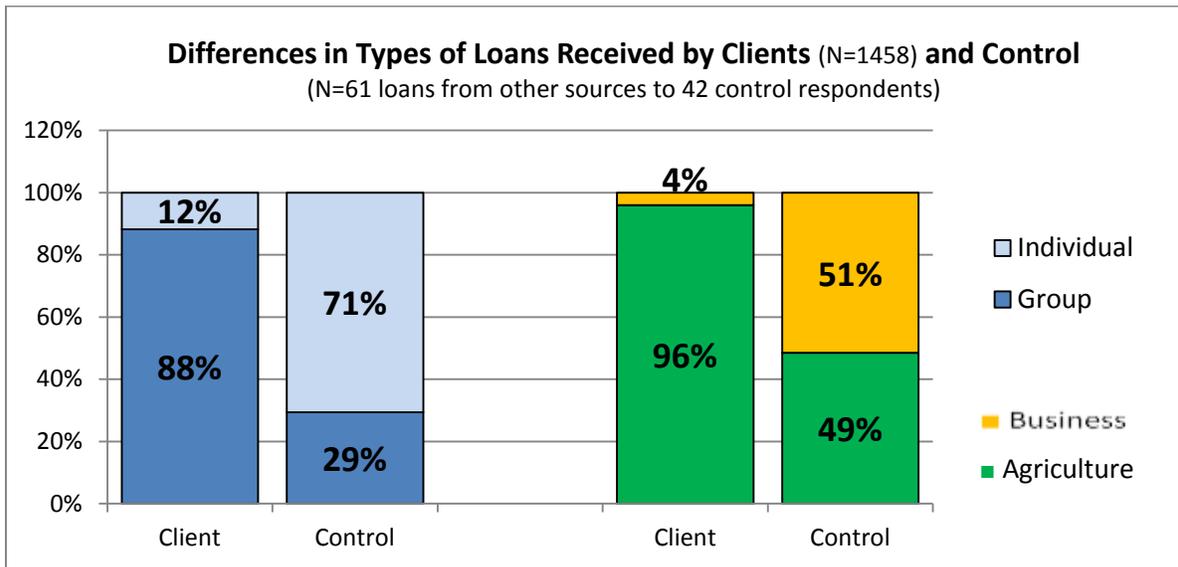
Table 6. Access to Credit ¹³ by Crop and Country								
Country	Crop	Status	n=	No. ¹⁴ Reporting Loans	Proportion Reporting Loans	Average No. of Loans per Client	Average dollar value per loan	Average Loan Duration (months)
Uganda	Coffee	Client	76	75	99%	2.1	\$264	8
		Control	31	11	35%	2.1	\$553	8
	Cotton	Client	61	60	98%	1.4	\$247	7
		Control	24	5	21%	1.2	\$353	11
	Maize	Client	96	96	100%	2.1	\$223	5
		Control	46	12	26%	1.6	\$283	7
	Sugar	Client	36	36	100%	1.3	\$2,388	18
		Control	39	11	28%	1.2	\$1,143	13
Ghana	Chili	Client	49	47	96%	2.9	\$545	7
		Control	14	3	21%	1.0	\$445	4
	Cocoa	Client	154	154	100%	1.8	\$342	9
		Control	49	6	12%	1.8	\$883	10
	Maize	Client	84	83	99%	1.2	\$232	6
		Control	24	4	17%	1.3	\$808	9
	Onion	Client	34	34	100%	2.9	\$606	7
		Control	16	15	94%	1.3	\$383	8
Malawi	Soy	Client	58	57	98%	1.1	\$117	6
		Control	40	3	8%	1.3	\$48	7
	Tobacco	Client	141	141	100%	1.8	\$1,089	7
		Control	58	8	14%	1.1	\$421	5
	Groundnut	Client	83	83	100%	1.1	\$25	7
		Control	41	3	7%	1.0	\$118	4
Overall		Client	872	866	99%	1.7	\$505	8
		Control	383	82	21%	1.4	\$528	8

Observation: When local currency loans are converted to dollars using an average exchange rate for the year, this gives an imperfect comparison between countries and commodities. Average loan size is clearly highest for sugar and tobacco and lowest for groundnuts. Overall, the control farmers who were able to borrow got slightly larger loans than Opportunity offers to clients, but access is severely limited. Only a 10% of the control respondents, who had collateral to offer, had access to loans from other MFIs or commercial banks. Another 11% of the control respondents had just received a loan for the coming 2013 production season from Opportunity. As expected, Opportunity clients had borrowed more frequently than control respondents.

¹³ This table presents information on loans to both clients and to control households from all sources including Opportunity loans to control respondents for 2013 production.

¹⁴ Six clients were represented at the survey by spouses who knew the client received a loan but could not report the details.

Figure 4. Differences in Types of Loans Received by Clients and Control



As clearly seen in the graph above, the distribution of the loans received in the last four years is also significantly different, with more of the non-Opportunity loans to control households being individual and business loans compared to Opportunity clients, most of whose credit is group loans for agriculture. Group loans provide access to credit for small farmers who don't have collateral.

Overall, in the last four years, the control group is much more likely to have gotten loans for other purposes, although agriculture still remains the major use. As illustrated below, however, when asked the purpose for which the loan was actually used, other needs such as education, land purchase and household emergencies surface.

Figure 5. Purpose for which Loans Used for Client Borrowers

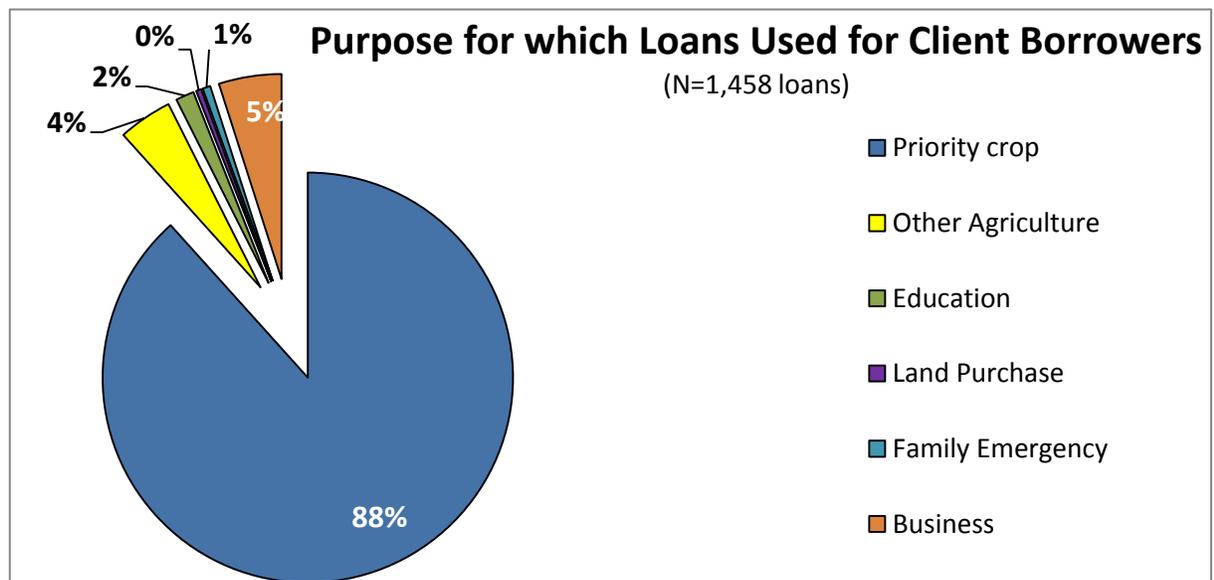
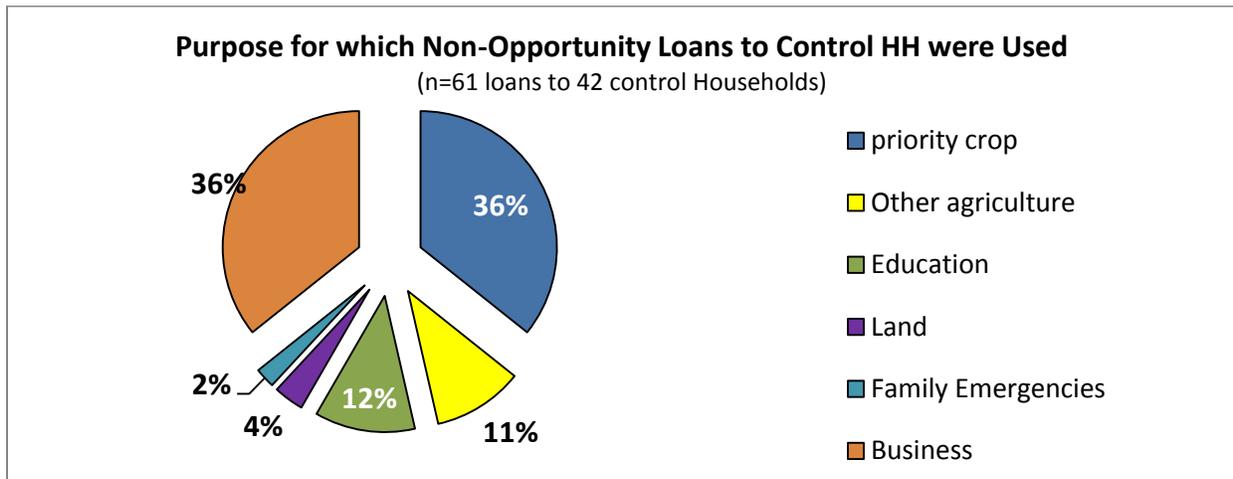
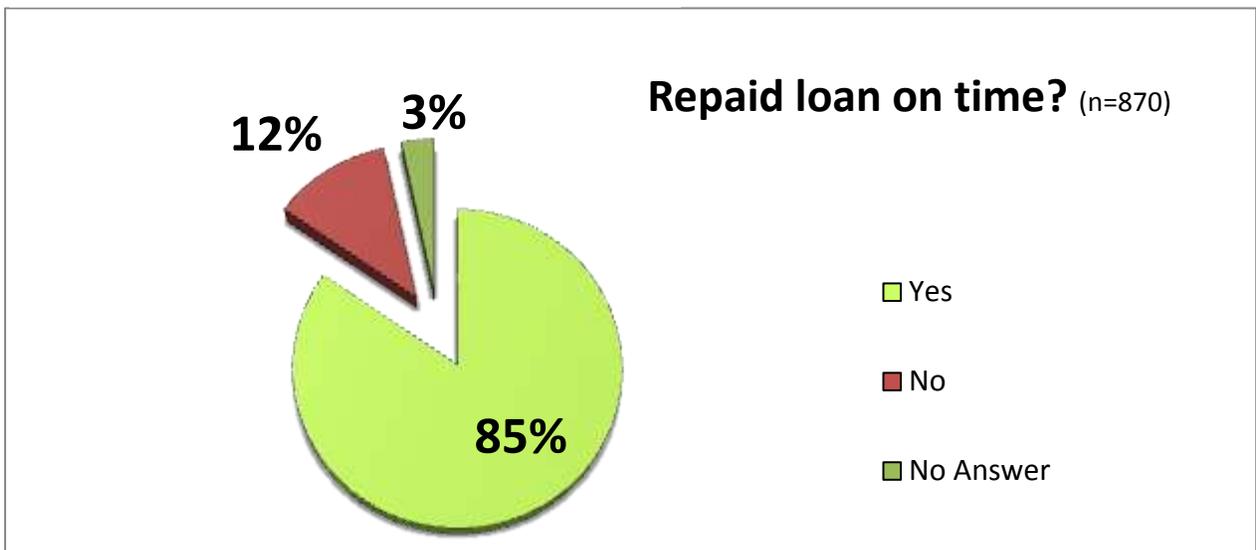


Figure 6. Purpose for which Non-Opportunity Loans to Control HH Were Used



Loan Repayment

Figure 7. Repaid Loans on Time?



Most of the clients had paid their Opportunity loans on time (85%). The situations that contributed to timely or late payment are shown below.

Figure 8. Explanations for Timely Payment

n=739 who paid on time.
Multiple answers allowed.
Total responses = 1,145

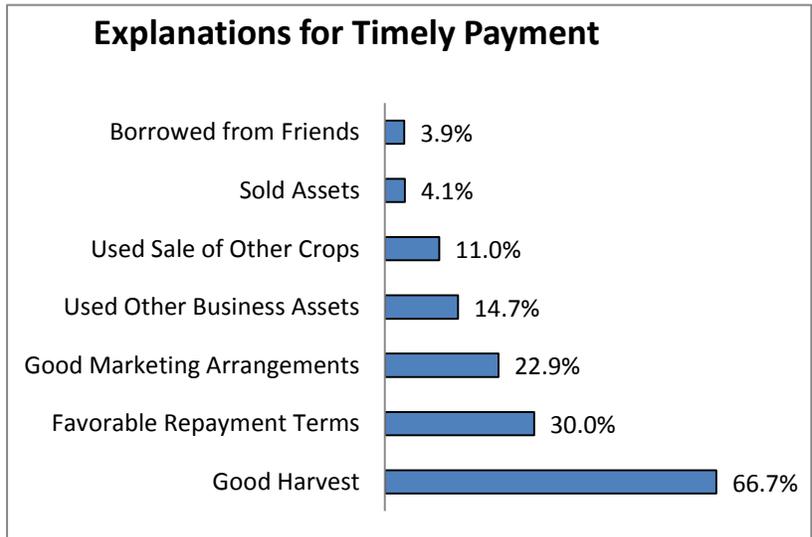
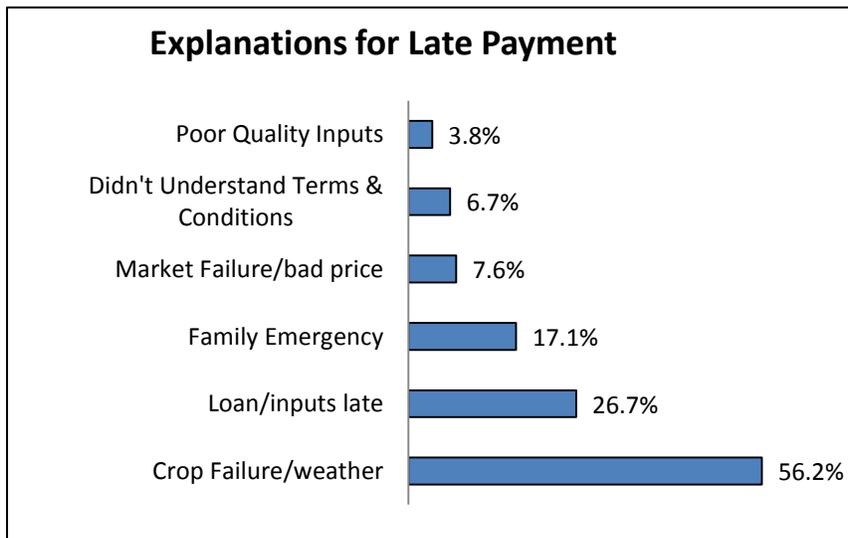


Figure 9. Explanations for Late Payment



n=105 who paid late.
Multiple answers allowed.
Total responses = 125.

Other Financial Services

In terms of knowledge of and access to other financial services, we see the greatest difference between countries rather than between clients and control group. Use of innovative forms of finance services such as ATMs, mobile van banking, agent banking, cell phone banking, and insurance is still extremely low, and most farmers have never used any of them. ATMs are most commonly used in Malawi (35%) and Uganda (25%), while cell phone banking is more common (12%) in Uganda. Malawi is the only country where crop insurance is available. A total of 32% of farmers in Malawi reported having ever had crop insurance coverage. Interestingly, very few of the clients are aware that their loan from

Opportunity includes a life insurance policy on the borrower and his family. The proportion of clients aware that they have insurance is only 16%.¹⁵

Of the clients, 55% say the loan has contributed to an increase in their savings. In 2013, 68% of clients now have savings accounts as compared with 44% in 2009. While this is partly because of the requirements of the loan,¹⁶ the most common explanation forwarded by respondents (40%) was that higher production resulted in greater cash reserves. Savings for rural households is, however, of necessity irregular because cash flow is a function of seasonal production and marketing. Distance to the nearest bank branch or outlet continues to be a major constraint frequently mentioned by respondents. Opportunity's significant progress in bringing banking closer to clients by opening new branches and instituting rural agents has made a positive contribution to improved financial access but distance is still a problem for many clients. Additional support is required to make financial services truly accessible to the majority.

A total of 83.76% of clients had received financial literacy training by Opportunity. This training was greatly appreciated and credited for 18% of the change in savings behavior. (See Annex 6 for more details.)

¹⁵ Please note that the percentage refers to the proportion reporting having ever had insurance coverage. No information was collected on the number that had actually made claims on that coverage or the adequacy of the coverage or success of the claims.

¹⁶ In Uganda Opportunity clients are required to have a security deposit account in addition to their regular savings account. In Ghana and Malawi the security deposits are kept in group accounts not individual accounts.

2.2. Changes in Production

Overall the study has shown that clients made significant increases in production as a result of their access to agricultural finance. For most crops, especially those where the loan was given specifically in the form of inputs, use of the appropriate inputs for the crop increased more for clients than for control households. Similarly, in almost all crops, average production and quantities marketed exceeded those for controls and increased significantly in 2012 compared to 2009. However, there were exceptions — these being: soybeans in Malawi, groundnuts in Malawi and cotton in Uganda. Each crop is analyzed in depth in section 2.3 to understand the factors contributing to the observed results.

2.2.1. Measurement Issues

Determination of changes in yield was initially one of the main objectives listed in the Opportunity Bank TOR. There are a number of difficulties with determining yield in Africa. They include the following:

- The inherent lack of accuracy in land area measurement, especially for small size plots that are opened by hand. Respondents reported land area measured in a variety of local measurement units which had to be converted roughly into standard acres for purposes of the study.¹⁷
- The fact that certain crops are not harvested at once, but rather are left in the field until such time as they are needed for food consumption or marketing. When the crop is harvested piecemeal, it is much more difficult to recall the total quantity that was harvested.
- Where the crop is marketed to a single buyer through just one marketing channel, total quantity marketed may be a good proxy for total production. But this is less likely to be possible if there are multiple marketing channels and/or the crop is both consumed and marketed.
- Part of the crop may be dried, threshed or shelled before storage and ultimate sale, while part of it may have been sold off or consumed when it was still fresh or not yet threshed. This is especially a problem of maize, which is eaten green on the cob, but later stored the cob and eventually marketed threshed and dried. Similar problems in conversion apply to items like groundnuts (peanuts) which can be sold or stored either in the shell or shelled.
- The fact that often fields are intercropped, and if you compare fields with differing ratios in their intercropping mix you are not comparing like with like.
- The fact that you have multiple seasons in a given year in some locations, and crops on a field may be relay cropped to maximize utilization, with another crop planted on the field before the first crop has been harvested.

It is challenging enough to try to quantify trends in area under production, and trends in total quantity produced. At least, in a given household, the direction of the trend in each of these two factors should be apparent. By dividing production by area cultivated to get yield, one risks compounding the errors inherent in both. For this reason, yield figures should be interpreted with caution.

The survey instrument therefore strove to establish production levels, the perceived change in production relative to the base year and the reasons for the observed change in production. This allowed us to understand the cause of observed trends in production levels for the crop, whether it was due to quality improvements in the enterprise or due to expansion of size of production unit or external natural factors like rain, soils, disease/pest infestation, and so on.

¹⁷ Opportunity's experience with measurement of fields for clients confirms that most farmers have only a vague idea about the size of their fields, which is rarely accurate.

2.2.2. Land Availability and Utilization

The survey revealed that access to loan financing facilitated expanded production of the priority crops. A larger proportion (42%) of client farmers rented additional land for agricultural production in 2013 compared to control farmers (35%). The proportion that bought land for agriculture and especially commercial properties is also higher for clients than control households. See also section 2.2.3 below.

Land availability and utilization is a very complex concept in Africa where multiple types of land tenure system often coexist. The design of the tool takes into consideration the various ways people gain access to land for agricultural production, including ownership (total land holdings whether by customary, freehold, or lease hold) borrowing/renting or sharecropping.

The survey tool also solicited information on how land available to the household is utilized (land under crops, pastures, woodlot, grazing land, fallow/idle, irrigation/swamps) and how this has changed between 2009 the base year and 2012 which is the last complete year. It was hypothesized that access to the loan might impact access to land (through increase in size of land holding, or renting in land. It might also impact on increased utilization i.e. area under crops/target crop).

Given the size and time frame of the research, it was not possible to actually visit the farms and measure land holdings using GPS. That would have been the obvious way to get highly accurate measurement, but would have been very expensive. We were left therefore, with recall information which is indicative at best, especially because most farmers have only a vague idea of their land size. This is one reason why Opportunity has put so much effort into devising a cost effective way to carry out farm mapping for all clients.

Information collected from the respondents on land ownership and use clearly showed that, in general, the client households had more land available even in 2009 than did the control households. Indeed, this may have been a factor leading these households to be less risk averse or more willing to innovate in the first place. When we look at the area of priority crops grown, we see a similar pattern with client respondents averaging larger acreages of priority crops than control farmers both at the beginning in 2009 and in 2012. So they tended to be the more serious farmers, the ones with a more commercial interest in production even from the start.

Table 7. Average Acreage grown to the priority crops in 2012				
	Crop	Client	Control	Overall
Uganda	Coffee	2.92	2.50	2.80
	Cotton	2.91	1.91	2.61
	Maize	2.42	1.81	2.23
	Sugar	16.57	5.44	10.86
Malawi	Soy	2.07	1.63	1.89
	Tobacco	3.41	1.69	2.91
	Groundnuts	1.07	1.29	1.14
Ghana	Chili	5.80	4.04	5.41
	Cocoa	9.39	7.77	8.99
	Maize	3.63	3.42	3.58
	Onions	2.75	3.16	2.88
Overall		4.71	3.18	4.24

Details on land ownership and utilization are provided in Annex 7.

2.2.3. Changes in Production Practices

To understand how the loan was used, the survey sought information on how agricultural production practices had changed in the last four years. Respondents were asked to indicate the acreage and the quantities of various inputs: improved seeds, fertilizers, pesticides, herbicides, tractor/oxen hire services, and hired labor used in production of the target crop in 2012 and 2009. Findings indicate that majority of the Client borrowers used the loan for its intended purpose—production of the priority crop. By and large the loan funds were used for the following:

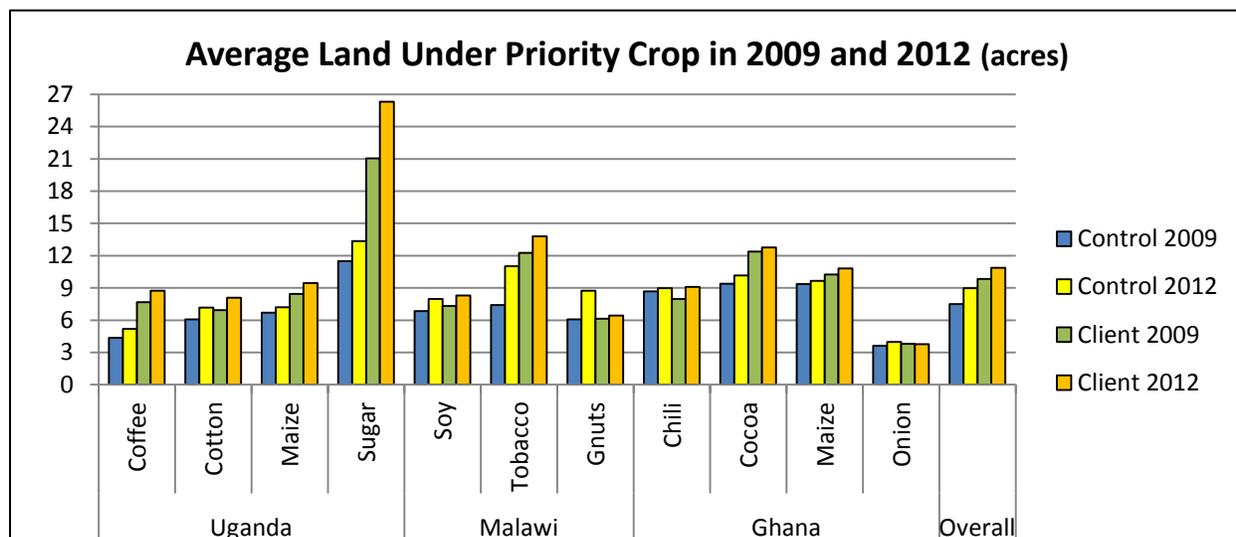
- a) **Purchasing production inputs.** The loan contributed to **improved access to production inputs**. It was noted that the loan enabled households to access production inputs which were either directly procured by the bank in Ghana, Extension Service Providers in Malawi or by farmers from local input suppliers.
 - Improved seed for maize in Uganda; onions, chilies, and maize in Ghana; as well as tobacco, groundnuts, soybean, and maize in Malawi.
 - Fertilizer for maize, onions, chilies, and cocoa in Ghana; coffee and sugarcane in Uganda; and tobacco in Malawi. Overall there was an increase in the average quantity of fertilizer used by client households from 597 kg in 2009 to 716 kg in 2012. Country disaggregated data reveal that average quantities of fertilizer used increased in 2012 across the 3 countries compared to 2009.
 - Crop protection chemicals for cotton in Uganda, onions and chilies in Ghana; tobacco and soybean in Malawi. Overall the average value of pesticides used in 2012 stood at USD 100.8 a figure below the 2009 average of USD 119. Country disaggregated data reveal that use of pesticides increased in Uganda from an average of USD 34.9 in 2009 to USD 39.4 in 2012. Average values reduced in Malawi and Ghana.
 - Weedicides were purchased for coffee and sugarcane in Uganda, as well as cocoa and maize in Ghana.
 - Production equipment was purchased: spray pumps, wheelbarrows, watering cans, and gumboots across the 3 countries as well as irrigation pumps and mist blower for onions and cocoa in Ghana respectively.
- b) **Hiring labor for opening land and field activities.** The loan also enhanced farmer capacity to use hired labor thereby ensuring timely field operations notably planting, weeding and harvesting.
- c) **Hiring tractors/oxen for land opening.** The loan funds enabled some farmers to use tractor hire services for land opening. Overall there was an increase in average number of acres for the priority crop opened by client households using hired tractor/oxen services from 7.4 acres in 2009 to 9.5 acres in 2012. Country disaggregated data reveal that the increase was registered in Uganda and Malawi. In Uganda it was most pronounced in case of borrowers who invested the loan in sugar cane production.
- d) **Renting land for production of priority crop.** The loan was also used for renting additional land for the priority crop—notably sugarcane in Iganga, and chili and onions in Ghana. The loan provided farmers with ability to increase the size of crop production through renting of more acreage.
- e) **Improved access to technical advisory services**
 - Nursery management (vegetables in Ghana and tobacco in Malawi), soil fertility management (all crops in Ghana, coffee and maize in Uganda as well as tobacco in Malawi), post-harvest handling and marketing (maize in Ghana and tobacco in Malawi).

- Farm visits for on-spot advice by field officers of the ESPs (maize and cocoa), government extension (maize), and Opportunity agricultural officers (onions and chilies).
- f) **Financial inclusion** is very important for smallholder farmers due to lack of appropriate alternative financial services from other providers for all crops in Ghana, soybean and groundnuts in Malawi as well as maize, cotton and coffee in Uganda.

The loan triggered changes in farmer production practices for the priority crop. Notable changes included the following:

- a) **Expansion of production units** for the various priority crops. Findings reveal that average area under the priority crops cultivated by client households increased in 2012 relative to 2009 levels (Figure 9).
- Sugarcane, maize and coffee in Uganda. In Masaka, farmers used the first loan to rehabilitate old plantations, while funds in the subsequent loan cycles have helped to purchase seedlings and open up more land under coffee production. Likewise, borrower farmers in Kyenjojo and Iganga opened more land for production of maize and sugarcane.
 - In Ghana, farmers expanded areas dedicated to onions and chilies on average due to access to cash loans that facilitated de-stumping, land rental and expansion of irrigation.
 - In Malawi, areas dedicated to tobacco were expanded due to access to inputs directly supplied by the ESPs.

Figure 10. Average Land Under Priority Crop in 2009 and 2012



- b) **Use of purchased inputs.** Overall there was an increase in proportion of households that reported using improved seed, fertilizer, pesticides and herbicides in 2012 compared to the proportions in 2009.
- Relatively higher proportions of client households were using purchased inputs compared to the control households. Pearson Chi-square test of $X^2=38.1$ for fertilizer and $X^2=23$ for pesticides significant at 1% suggest that use of the inputs is skewed in favor of client households.
 - Client households registered relatively higher increases in proportions using the various purchased inputs compared to corresponding increments for the control households.
- c) **Increased use of hired labor** to ensure timely field activities notably in coffee, sugar cane and maize production in Uganda, cocoa, onions and chilies in Ghana and tobacco in Malawi. The hired labor

enabled farmers to open land and plant on time in case of the annual crops across study countries; optimal and timely weeding of the crop, timely fertilizer application and spraying as well as timely harvesting. In the case of coffee in Uganda, it was noted that the loan enabled farmers to turn formerly unproductive land into new coffee plantations while hired labor has helped to improve plantation/garden management. The coffee plantations that were bushy and unproductive are now maintained.

- d) **Minimizing selling the crop while it is still in the field or flowering.** There had been a long-standing habit of selling coffee while it was still on the tree because farmers need urgent cash for household requirements. Now the groups monitor and enforce discipline.

Average quantities of production inputs used per crop are presented in Annex 8.

2.2.4. Changes in Input Use, Production, Marketing and Yield by Crop

Information was sought on the production levels of the key target crops in the first and second season of 2012 following utilization of the loan and in 2009 prior to accessing the Opportunity Bank agricultural loan. Respondent households were asked whether they had engaged in production of the target crop on their farms in 2012 and 2009. They were also asked to provide information on acreage and quantities harvested for the target/priority crop. Estimates for acreage were established by asking farmers for local measures for area of their fields during the questionnaire interview and then converted into acres.

In estimating harvested quantities, care was taken to probe for what was consumed (fresh or dry), quantity sold and quantity given out as in kind payment to laborers or physical transfers to friends/relatives. Paired sample analysis was used to establish and compare the average quantities produced in 2012 with those from 2009.

MALAWI

Tobacco

Findings reveal that the access to the loan have contributed to increased average household tobacco production levels, quantity marketed and yields. In absolute terms, the increases in the client households are 20 times more than the relative increase registered by control households.

- Average household production and quantity marketed in client households increased by 6.5 bales from 14.8 bales in 2009 to 21.3 bales in 2012. Test for equality of the means returned t-value of 5.3 significant at 1% implying that the quantities produced and marketed in 2012 were significantly different from those in 2009. Corresponding figures for control households stand at an increase of only 29 kg from 6.6 bales in 2009 to 6.9 bales in 2012.
- On average client households sell 622 kg of tobacco over and above what the control households' sell. At a unit price of USD 2 per kg of leaf tobacco, client households earn USD 1,243 more than what control households earn from tobacco.
- Average yields increased from 4.4 bales/acre in 2009 to 6.1 bales/acre in 2012 in case of client households. This reflects a 40% increase in yields compared to before the loan. On the other hand yield levels for control households increased marginally from 3.9 bales per acre in 2009 to 4.0 bales per acre in 2012. Yield levels registered by client households are close to findings from the Living Standards Measurement Study – Integrated Surveys on Agriculture which stand at 6.6 bales per acre of burley tobacco.

Increase in average household tobacco production, quantity marketed, and yield levels in client households were attributed to—

- Increased use of inputs due to improved access to production capital that enable them to access adequate quantities of the required inputs. It was noted that the loan enabled households to access production inputs. Findings reveal that the proportion of client households acknowledging having used crop protection chemicals and fertilizer in production of their tobacco increased from 54% and 97% in 2009 to 86% and 99% in 2012 respectively.

Table 8. Household Use of Purchased Inputs in Production of Tobacco

Percent of Households Growing Tobacco Reporting				
Practice	Control		Client	
	2009 (n=52)	2012 (n=55)	2009 (n=126)	2012 (n=140)
Fertilizer application	92	98	97	99
Pesticides/fungicides	52	64	54	86
Herbicides	0	0	1	2
Average Quantity Per Acre				
Fertilizer (kg)	152	164	226	249
Quantity produced (kg)	661	690	1,476	2,125
Quantity marketed (kg)	661	690	1,476	2,125
Yield (kg/acre)	393	400	438	614

Prior to getting loans from OIBM and the other banks working with the tobacco companies, some farmers were getting loans in form of input coupons/vouchers from the government-run Malawi Rural Finance Company (MRFC) for production of tobacco. They would then take the coupons to agro input dealers to get the inputs. Farmers noted that they were not able to access adequate quantities of all the inputs required for production of tobacco and this limited their ability to increase production. MRFC stopped disbursing loans implying that farmers had to find other alternatives.

- Optimal application of fertilizer and crop protection chemicals. Findings reveal that fertilizer application rates have improved—hence increased production and productivity. Client households have increased the quantity of fertilizer used on tobacco from 226 kg per acre in 2009 to 249 kg per acre in 2012. The client farmer reported quantities in 2012 are now close to the recommended application rate of 263 kg per acre for burley tobacco.

Participants in focus group discussions noted that prior to contract farming with the tobacco companies, most of them were struggling to access inputs, but this changed with effect from the 2011/2012 production season, as the tobacco companies began supplying adequate quantities of all the inputs. They noted that receiving the inputs collectively had ensured that: i) there is uniformity in carrying out all farm operations at the same time; ii) same quality of inputs is received by all farmers; and iii) farmers can learn from one another during different stages of crop development.

Farmers indicated that without the loans they could not have managed to grow tobacco as the crop requires inputs which are not affordable by most poor farmers. Many of them might have resorted

to legumes such as groundnuts and soybeans that require less costly inputs. Others noted that because, traditionally, they are tobacco farmers, they would have continued growing tobacco applying less than the required quantities of inputs—a scenario that would have resulted in lower production, poor quality leaf, poor prices at the floor, and lower income from tobacco.

- Adoption of good production practices due to access to advisory services at different stages from nursery management through to baling of the leaf. Participants in focus group discussions noted that they had acquired knowledge and skills in— i) nursery management, ii) how to make ridges based on the slope in the field, iii) using the right fertilizer at the right time, iv) grading, and v) baling tobacco with the right moisture content. Under the contract farming arrangements with tobacco buying companies, farmers said that they put into practice whatever they learn from Extension Services Providers. Club leaders and members have been mandated to ensure that all tobacco operations are moving at the same pace. This includes overseeing the establishment of nurseries, and the construction of curing barns. The committees also ensure that there is no side-selling of the leaf that could lead to default on loans. Each member watches over another member just to make sure that side-selling does not take place.

- This was noted to have contributed to—
 - i. Higher yields of tobacco being realized compared to the previous years when farmers were not trained. Before training most farmers realized 2.4 bales of tobacco per acre (240 kg) but with the training farmers are now getting between 6 to 8 bales per acre.
 - ii. Good quality leaf is presented at the floors thereby fetching better prices culminating into increased income from tobacco.
 - iii. With increased productivity farmers' income has also improved: to fully repay the loan a farmer needs at least 400 kg of tobacco (4 bales) and with an average production of 15-21 bales a farmer is left with the proceeds from 11-17 bales for household use. Previously the average production was 12-13 bales and thus a farmer was only left with 8-9 bales' proceeds for his use. Those farmers producing 20 bales and over have about 16 or more bales' proceeds to themselves, which represents a remarkable increase in income.

On the other hand, climatic change was cited as the main factor that constrained increased production for the tobacco farmers. Participants in focus group discussions explained that unfavorable weather conditions notably early tail-off of the rains towards the end of the rainy season in Kasungu and Dowa-Mponera area, and hailstorms in Mponera affected production levels. Isolated cases of crop loss due to wild fires were also noted to have affected production levels for some households.

The changes observed in control households were attributed to general trends in the external landscape. The government-introduced Integrated Production System (IPS) for tobacco targets all farmers; hence, even the control farmers access training from other service providers such as the tobacco associations to ensure that the crop is produced to standards with Good Agricultural Practices (GAP). The tobacco associations provide services to all their members, including those not contracted by the tobacco companies. The Tobacco Association of Malawi (TAMA) sponsors radio programs on various local radios; publishes quarterly bulletins to inform and update growers about new developments in the tobacco industry; and through its technical wing the Agriculture Research and Extension Trust (ARET), TAMA provides extension services to its members.

Tobacco (Malawi). In Malawi, smaller farmer “clubs” are grouped into “clusters.” Document review and interview research engaged farmers from two clusters—of which one group was the Chicondi clubs. Data was analyzed for fifteen farmers who received loans in 2012, and eleven who did not (one farmer, who did not grow tobacco in previous years, was left out from the analysis), strongly suggests an interesting pair of correlations: Increases in yield positively correlate to increases in fertilizer use; and, there is a negative relationship between increases in land acreage cultivated, and changes in yields and fertilizer usage.

First, increase in fertilizer usage and yields are positively correlated. In 2012, clients increased fertilizer usage by 98%, while their tobacco yields rose by 78%. Conversely, other clients decreased fertilizer usage by 36% and their yields decreased by 30%. Second, land acreage increase and fertilizer usage are negatively correlated. In 2012, clients who increased fertilizer usage decreased land cultivated by 18%; conversely, clients who decreased fertilizer usage increased land cultivated by 115%. The results clearly show that the loan capital was effectively applied by loan clients toward either increasing yields or land size. Where less fertilizer was applied, capital was channelized to increase acreage (buying extra seed, inputs, land or renting land).

Overall, yields increased for client farmers in 2011 and 2012. In 2011, a larger proportion of farmers did not take out loans; 9 farmers took out loans versus 15 who did not. The nine loan clients experienced an 18% jump in yield against a 6% yield increase for non-loan farmers. In 2012, the yields for the 15 loan farmers saw an increase of 5%, whereas the non-loan farmers experienced a contraction in yields by 13% on the average. Non-loan farmers had decreasing yields in 2012, despite higher fertilizer usage. Non-loan farmers preferred to increase land size. In 2011, decreasing fertilizer usage resulted in increases in yields, which hints that fertilizer was not a significant determinant in yield increase for non-loan farmers in that year. Given industry-wide recognition of the effectiveness of fertilizer, this is a mystery for which we have no explanation. Please see Annex 11 for further details.

Soybeans

Findings reveal that the loan increased farmer access to production inputs notably improved seed and fertilizer. Higher proportion of client households reported using improved seed, fertilizer and pesticides in 2012 compared to 2009 (Table 9). In 2012, relatively higher proportion of client households acknowledged using the improved seed, fertilizer and chemicals compared to the control households unlike in 2009 where higher proportions of control households were using fertilizer and pesticides compared to the client households.

Practice	Control		Client	
	2009 (n=30)	2012 (n=40)	2009 (n=49)	2012 (n=57)
Improved seed	80	90	84	98
Fertilizer	27	35	14	61
Pesticides	10	10	6	14
	Average			
Quantity produced (kg)	377	450	662	520
Quantity marketed (kg)	337	405	597	473
Yield (kg per acre)	478	421	488	308

Clients produced and marketed more soybean than control households in both 2012 and 2009. But comparisons of client production between the two years reveal that quantities fell somewhat in 2012 due to the reasons explained below.

- Average household production in client households decreased by 142 kg from 662 kg in 2009 to 520 kg in 2012. Corresponding figures for control households reveal an increase of 72 kg from 377 kg in 2009 to 450 kg in 2012.
- Average quantity marketed in client households decreased by 124 kg from 597 kg in 2009 to 473 kg in 2012. Corresponding figures for control households reveal an increase of 68 kg from 337 in 2009 to 405 kg in 2012.
- Both client and control households registered a decrease in average yields in 2012 relative to the 2009 levels. The decrease was higher in client households 180 kg compared to control households whose corresponding figures stand at 58 kg. Average yields in client households decreased from 488 kg per acre in 2009 to 308 kg per acre in 2012 while the control households registered a decrease from 478 kg per acre in 2009 to 421 kg per acre in 2012. The observed yields in client households are just half of the expected yield from the improved variety and fertilizer which stand at 607 kg per acre.¹⁸

Thus the findings reveal that the loan inputs (seed and fertilizer) provided to client farmers did not lead to an increase in production. Low production and consequently low yields for clients households was attributed to—

- Late planting due to the wholesaler/ESP distributing the seed late around 20-21 January 2012 that was outside the optimal planting window which should run from December to mid-January. Consequently water stress during critical periods of crop growth negatively affected the production levels and resulted into poor yields. On the other hand, control households that did not have to wait for seed from GALA were able to plant on time.
- Inadequate quantity of inputs received by farmer from the loan wholesaler—Grain and Legumes Association (GALA). The arrangement was that farmers would pay a deposit of USD 6.7 (MK 2000) for them to access soybean seed and other inputs—notably fertilizer, pesticides and sacks. But as it turned out, GALA did not live up to its promises and issued quantities that were much less than originally agreed. Also the inputs were not distributed uniformly to all farmers, some received seed, fertilizer and pesticides, some received seed and fertilizer only while others received only seed. Farmers noted that they had expected to get between 50-160 kg of seed which is enough to plant 1.1-4.0 acres but quantities received ranged between 10-40 kg just enough to plant 0.25 to, at most, 1 acre. Thus, client farmers who had prepared large acreage could not plant all the prepared land.

Likewise, client farmers were promised 150 kg of NPK fertilizer and 1 liter of a foliar fertilizer but received either 5 kg of NPK, 1 liter of the folia fertilizer or none at all. The inadequate quantities of fertilizer did not allow for optimal application rates to be used which further limited production and yield levels. Therefore the loan arrangement facilitated by GALA led to a negative impact as most farmers paid the loans from other sources instead of Soybeans produced through the loan.

It was observed that eight in every ten households were using improved soybean seed even before the loan. This seems to stem for efforts of other organizations such as NASFAM which supports seed multiplication for soya. The crop is also supported by the Clinton Initiative. Hence, the other inputs

¹⁸ Information from National Association of Smallholder Farmers in Malawi (NASFAM)

in the loan package were expected to make a difference and ensure better yields for the client farmers but limited quantities and lack of adequate knowledge impaired their effectiveness.

- Limited knowledge and skills on good production practices. No training was provided to the farmer club members on the use of good agriculture practices in the production of soybeans to increase yield hence they resorted to use of local knowledge. GALA did not add value to farmers' production skills—it had neither extension workers nor demonstration plots. Farmers noted that they did not know how to use (timing of application and rate) the liquid fertilizer that GALA distributed. GALA gave verbal instruction to farmers on the use of liquid fertilizer at the time of distribution, but without demonstrations, most farmers had missed the technical details since there was no hands-on experience.

Groundnuts

The OIBM wholesaler loan client – Chitsosa Trading – distributed 10 kg of improved groundnut seed (CG 7) per household in the target farmer groups for the 2011/2012 production. The loan enabled farmers to access a superior improved variety which yields twice as much as the other varieties. Findings reveal that the proportion of client households using improved varieties increased from 84% in 2009 to 100% in 2012. The loan package did not include other inputs (fertilizer, and pesticides/fungicides) other than seed. Findings reveal that, with the exception of 1 client household which used fertilizer in 2009 and again in 2012, no other household irrespective of status used fertilizers or crop protection chemicals in production of groundnuts in the two years.

Table 10. Finding Related to Groundnut Production in Malawi				
Characteristic	Control		Client	
	2009 (n=31)	2012 (n=71)	2009 (n=40)	2012 (n=84)
Percent of Households Growing Groundnuts Reporting				
Use improved seed (%)	76	100	84	100
Average per Household				
Quantity produced (kg)	263	373	235	280
Quantity marketed (kg)	233	330	184	229
Yield (kg per acre)	325	380	287	388

Findings reveal an increase in average quantities produced, marketed and yields in 2012 relative to the 2009 levels for clients.

- Client households registered an increase of 45 kg in the average quantity produced from 235 kg in 2009 to 280 kg in 2012. Corresponding figures from the control households reveal an increase of 110 kg from 263 kg in 2009 and 373 kg in 2012.
- Average quantity marketed by clients increased from 184 kg in 2009 to 229 kg in 2012. Test for equality of the means returned a t-value of 1.9 significant at 10% that confirms that the average quantities produced and marketed by client households in 2012 are significantly higher than those in 2009. Total production and quantity marketed, however, is less in both years than for controls.

The low production levels in client households compared to controls were attributed to—

- a) Limited loan amount. Farmers noted that the small quantities of seed they got from Chitsosa Trading limited their ability to increase production so as to get a larger marketable surplus and maximize income. Hence, the small quantity of seed limited the impact of the loan on production levels and quantity marketed by the client households. The 10 kg can only plant 0.3

acres which is well below the average area devoted to groundnuts by farmers in Malawi which stood at 0.77 acres in the 2009¹⁹ production season. Participants in focus group discussions noted that they had planted small gardens as some of the land they had opened to plant groundnuts was left fallow due to shortage of seed as they had already used the home saved grain for other purposes expecting to get enough seed from Chitsosa.

- b) Timeliness of seed distribution. Some of the farmers received the seed after the onset of the rains such that farmers missed the opportunity to plant with the first rains hence those particular farmers planted late.
- c) The late-planted crop was more affected by groundnut diseases.

Client households registered a relatively higher increment in yield levels: 35% compared to control households whose corresponding figures stand at 17%. Average yields increased from 287 kg per acre in 2009 to 388 kg per acre in 2012 in case of client households and from 325 kg per acre to 380 kg per acre in case of control households. The relatively higher increase in groundnuts yields in client households was attributed to the following:

- a) Superior quality improved seed which yields twice as much as the local varieties;
- b) Training and demonstrations that were conducted. Chitsosa Trading organized training/demonstrations on agronomic aspects of groundnuts in the catchment area. However, not all farmers attended because distance to the demonstrations site was far for some farmers. Of the people who attended the Focus Group Discussions, only 30% acknowledged to have participated in the training at the demonstration sites. Those who attended the training/demonstrations indicated that they have adopted good crop husbandry practices, have increased groundnuts production taking advantage of high productivity from improved varieties which yield twice as much as the local variety, and have also increased income from groundnuts sales.
- c) Committee members in each club that ensured that members follow good agriculture practices.

UGANDA

Coffee

The loan enabled increased access and utilization of production inputs. Findings from the household survey reveal—

- An increase in proportions of households acknowledging using fertilizer, crop protection chemicals, and herbicides in 2012 compared to 2009. The proportion of client farmers reporting use of fertilizer and pesticides increased from 33% and 27% in 2009 to 88% and 60% respectively. Relatively higher proportions of client households reported using fertilizer and crop protection chemicals in coffee compared to the same proportion for control households in both years (Table 11).
- Quantity of fertilizer applied increased and is now very close to the recommended rate of 90 kg per acre per year.
- Average value of crop protection chemicals used doubled from USD 23.1 in 2009 to USD 48.1 in 2012.

¹⁹ lsms@worldbank.org; *The Living Standards Measurement Study – Integrated Surveys on Agriculture*

Table 11. Percent of Households Growing Coffee Reporting				
Practice	Control		Client	
	2009 (n=28)	2012 (n=28)	2009 (n=67)	2012 (n=74)
Fertilizer	25	46	33	88
Pesticides	11	29	27	60
Herbicides	54	79	48	74
	Average			
Fertilizer (kg per acre)	74.4	84.9	77.3	87.8
Pesticides (value in USD)	21.4	32.5	23.1	48.1
Herbicides (value in USD)	55.4	56.9	53.6	54.5
Quantity produced (kg)	1,330	1,255	1,116	1,767
Quantity marketed (kg)	1,314	1,240	1,097	1,725
Yield (kg per acre)	716	551	542	779

Use of the production inputs coupled with better management of the coffee plantations, was noted to have contributed to increased production levels, quantity marketed and yields. Findings reveal the following:

- Client households registered higher quantities produced and marketed in 2012 compared to the control households while the reverse was actually true in 2009.
- An increase of 651 kg and 628 kg in average quantity produced and marketed by client households between 2009 and 2012 while the control households registered a decrease of 75 kg and 75 kg between the two years.
- Quantities produced and marketed in 2012 by client households are significantly higher than those in 2009. Test for equality of means returned a t-value of 5.5 significant at 1%.
- Client households registered an increase in yield in 2012 of up to 238 kg relative to the 2009 levels while control households registered a decrease of 165 kg. Client households got significantly higher yields in 2012 compared to the 2009 levels (t-value =2.9 significant at 1%). The observed yields are above the national yields level which stood at 424 kg per acre of Robusta coffee in 2011.²⁰ The findings on increase in yield are in line with findings from a recent study by International Institute of Tropical Agriculture (IITA)²¹ which reported that yield for Robusta coffee were 400 kg per acre per year but farmers can easily double their production by using fertilizer and improving farming practices.

The higher proportion of client households that used fertilizer at optimal rates, applied crop protection chemicals and provided better care to their plantations by undertaking timely field activities accounts for the increase in production and yields. Decreased production levels and corresponding decline in quantity marketed and yields for control farmers were attributed to coffee wilt disease which led to drying of trees thereby forcing the farmers to replant new ones; coffee twig borer that affects the coffee bearing branches and unfavorable weather in the second half of 2012.

²⁰ Calculated based on production figures from Uganda Bureau of Statistical Abstract 2012.

²¹ Dr Piet Van Asten Systems Agronomist, IITA-Uganda 2011

Coffee Production and Pricing. Document review and interview research covered two coffee groups—the Eyali Aseka Farmer Society and the Kasambya Farmer Society—and gathered production data, plantation size, and sale price of produce from 2010 to 2012 in the former group and 2011 to 2012 in the latter. Both groups received their first loans in 2011 and completed it in 2012. These farmers experienced variable impacts in 2012. While there were some who did reasonably well, others did not do so well. While it did not impact all farms equally, hot weather conditions that year widely affected coffee output. In addition, pest attacks also negatively impacted output. The data gathered reflects the negative impact of these unfavorable conditions resulting in lower yields than 2011 for some, despite application of loan-funded fertilizer.

Eyali Aseka exemplified these mixed experiences. In 2012, four of the ten farmers reported higher yields and five reported a decline, compared to seven reporting an increase and two reporting a decline in yield in 2011. For those reporting higher yields, there was an increase of 27% in yields in 2012, and a 141% increase in 2011. While the use of fertilizer is proven to be effective in increasing yields, external factors such as the Coffee Wilt disease, pests, and hot weather negatively impacted production. The Kasambya group showcased a slightly different dynamic: the different sale prices that farmers can experience if farmers bring processed beans to the market. Opportunity loan officers encouraged farmers to process the dry cherry. Data from this group, especially when compared with the data for Eyali Aseka, show how loan clients have obtained higher prices by selling hulled (processed) coffee beans. Opportunity is currently encouraging the Eyali Aseka group to move in the same direction. For further details, please see Annex 11.

Sugarcane

This is a cash loan with funds released in tranches in line with the crop budget activities. The loan enabled client households to access capital for buying increased quantities of seed cane, hire tractors for opening, and renting land for expansion of area under the crop and hiring labor for field operations. Findings reveal that—

- Client households have expanded area under sugar cane more compared to the control households. Average area households devoted to sugar cane increased by 5 acres in client households compared to 2 acres in control households.
- Client households used tractors/oxen hire services on more acres. An increase in the number of acres opened by tractors/oxen, by 2.2 acres was observed in the case of client households compared to 0.8 acres for control households.
- One in every three client households reported using crop protection chemicals in sugar production in 2012 compared to one in every five control households.

Table 12. Percent of Households Growing Sugar Cane Reporting				
Practice	Control		Client	
	2009 (n=33)	2012 (n=38)	2009 (n=31)	2012 (n=33)
Herbicides	18	21	19	33
Fertilizer	13	13	10	12
Pesticides	6	13	10	15
	Average			
Area planted (acres)	4	6	15	20
Hiring tractors/oxen for opening land	3.6	4.5	12.5	14.7
Quantity produced (kg)	153,713	168,141	534,536	665,764
Quantity marketed (kg)	152,666	166,975	526,357	665,371
Yield (kg per acre)	39,690	33,632	36,928	46,276

- Average quantity produced and marketed in 2012 increased by 131.2 tonnes²² and 139 tonnes in 2012 respectively relative to 2009 levels. In the same period, the control households registered relatively smaller increases of 14.4 tonnes and 14.3 tonnes in quantity produced and marketed.
- Average household yields increased by 9.3 tonnes in client households compared to a reduction of 6 tonnes in case of control households.

Expansion of sugar cane gardens by bringing more virgin land under cultivation coupled with timely field operations and increase in proportion of client households applying crop protection chemicals have resulted into increased production and yield levels. Low use of fertilizer for sugarcane production was attributed to land being considered still fertile/virgin. It was noted that after 3-4 cuttings that is when farmers will need to increase use of the fertilizer. Since cane can be cut and the crop grows again up to 3 or 4 times over 6 years, it implies that client households will greatly benefit from this investment. Most of the production costs are incurred during crop establishment. This is due to the fact that there are minimal costs in raising the crop for subsequent cuttings. Repaying the loan takes almost all the returns from the first cutting, but high profits are expected in subsequent seasons.

Maize

This is a cash loan for farmers in Kyenjojo district and they decide how they use the funds. The loan has enabled more farmers to buy improved seed, herbicides for weed control, and hire labor for timely field activities. Survey findings reveal the following:

- The proportion of client households using purchased seed increased by 20% from 23% in 2009 to 43% in 2012. This is in comparison to control households where there was no change in proportions using purchased seed in 2012 from 2009 levels.
- Five in every ten client households used herbicides in 2012 compared to two in every ten who acknowledge the same in 2009.
- An increase in the proportions using fertilizer and pesticides was observed, though the percentages are still low.

²² Please note that quantity measurements in the document are all done using the standard metric system. One tonne (or metric ton) is equal to 1,000 kilograms or approximately 2,205 pounds. This differs from the English ton which is 2,000 pounds (907.19 kg).

- Client households had larger average quantities produced and marketed compared to control households in both years.
- Average quantities produced and marketed in 2012 by client households are significantly higher than those registered in 2009. Test for equality of means gave a t-value of 3.5 significant at 1%.
- An increase in average yield levels was observed in 2012 relative to 2009 levels. Yield levels registered by client households are close to national figures which stood at 1,012 kg per acre in 2009 and 972 kg per acre in 2011.²³ On the other hand, yield levels registered by control households are lower than the national figures.
- The relatively large proportion of client households who relied on recycled home-saved seed coupled with low utilization of fertilizer appears to have impeded greater increase in yields. The fact that farmers were left to find their own inputs providers may have contributed to this.

Table 13. Percent of Households Growing Maize in Uganda Reporting					
Practice		Control		Client	
		2009 (n=30)	2012 (n=39)	2009 (n=69)	2012 (n=81)
Use improved seed	From any source	54	74	65	82
	Home saved	39	46	53	51
	Purchased	36	36	23	43
Herbicides		20	44	19	52
Fertilizer		0	13	9	16
Pesticides		7	5	4	14
Average					
Quantity produced (kg)		1,912	3,360	3,236	4,185
Quantity marketed (kg)		1,692	3,112	2,898	3,801
Yield (kg per acre)		589	732	909	1,010

²³ Information calculated from data accessed from Uganda Bureau of Statistics (UBOS) Statistical Abstract 2012

Maize Grain (Uganda). Document review and interview research was conducted on farmers from two maize groups—Rwibaale Tweimukye group and Kyabajagara in Kyenjojo. Annual production data, land acreage under maize, quantities consumed and marketed, and sale prices were obtained for each year from 2010 to 2012. Although the data provides evidence of increasing the farm productivity, the members of the two groups invested the loan capital differently.

The Rwibaale Tweimukye members used more fertilizer and preferred monocropping of maize (land dedicated to maize) over intercropping to maximize yield. Of the eight of ten farmers who received a loan, five increased their yield by an average 30% while three farmers maintained it at a constant level – none experienced a decrease in yield. The same eight farmers had not performed as well in summer 2011 (no loan was taken). That year, only four out of the eight had experienced an increase in yield, and the average increase in yield was only 9% compared to 19% in 2012. The loans given to the group also had a significant impact on improving household consumption of maize as a food staple. In 2012, of the eight farmers, five increased consumption of the produce at home, and for three it remained constant. On the other hand, in 2011 when no loan was taken, three of the eight reduced their maize consumption, and one consumed none at home. This provides suggestive evidence of an improvement in access to food for household consumption because of the loan.

In the Kyabajagara group, all farmers who received loans monocropped maize, and preferred to invest in increasing land acreage under cultivation. The client portion of this group showed two different patterns of land use exhibiting a relationship between land and yield. Of the seven farmers who got the loan, the yield for four decreased, but three of those four farmers increased the land acreage, while one did not change the area cultivated. This suggests that the loan incentivized using loan capital to increase area cultivated, which affected yields negatively, as farmers ended up applying insufficient fertilizer. The remaining three of the seven who either reduced or did not change land acreage and got loans, increased yield. The non-client portion of this group exhibited significantly different characteristics. Compared to the client farmers, non-clients allocated on average a significantly smaller acreage to maize (0.31 acres in contrast to 1.32 acres for clients). Moreover, they achieved high yields. This may suggest that they had access to fertilizer outside of the loan, and were allocating a small portion of the land to maize, primarily for household consumption. For further details, please see Annex 11.

Cotton

The cotton loan was broken into two components: cash and inputs. Cash was disbursed, primarily for weeding, after verification of the area that the farmer had planted. Inputs take about 45% of the loan. The loan led to increased access to production inputs notably fertilizer and crop protection chemicals. Survey findings indicate that—

- Roughly two in every three client households used fertilizer in production of cotton in 2012 compared to one in every five who acknowledge the same in 2009.
- The proportion of client households using crop protection chemicals increased by 47% from 38% in 2009 to 85% in 2012. The corresponding increase in control households stood at 27% from 48% in 2009 to 75% in 2012.
- Client households registered higher quantities produced and marketed as well as higher yields in both 2009 and in 2012.

- There was a general reduction in average yield levels in 2012 relative to the 2009 levels. The reduction in production and resultant poor yields was due to hailstorms and too much rain towards harvesting period for the 2012 crop that affected all farmers.
- Most of the cotton loan clients got their loans in 2011. That year, some farmers got poorer yields because of drought. The poor prices for the 2011 crop which stood at UGX 1,000 – significantly below the indicative price of UGX 1600 announced by Uganda Cotton development authority and well below the UGX 2,500-3,000 at the time of applying for the loan – further compounded the farmers’ misery and negatively affected their ability to repay the loan using proceeds from the crop. It was noted that world prices had been on the rise for 3 years in a row due to low production in India and other major producers. However, 2011 realized increased global cotton production which led to collapse of the local prices. Many client farmers had to raise funds from other sources in order to repay the loan. Hence, a large number of them abandoned the crop in 2012.²⁴ For instance, the ESP for cotton Mutuma Commercial Agencies Ltd had 287 farmers in 2011 but the number reduced to 97 in 2012 and is only expected to rise to 165 for the 2013 production season.

Table 14. Percent of Households Growing Cotton Reporting				
Practice	Control		Client	
	2009 (n=22)	2012 (n=23)	2009 (n=45)	2012 (n=61)
Fertiliser	18	35	22	64
Pesticides	50	78	38	85
Herbicides	9	13	2	12
Average				
Quantity produced (kg)	635	708	2,095	1,126
Quantity marketed (kg)	630	705	2,093	1,108
Yield (kg per acre)	317	312	481	364

Note that the number of farmers producing cotton in 2009 is smaller than in 2012. Many farmers were encouraged by the rising prices and came back to cotton in 2010 or 2011 after not growing it for a number of years.

GHANA

Cocoa

The loan was provided in the form of inputs. The total loan amount depended on cost of inputs and target acres that were pegged to the loan cycle. First cycle is limited to 2 acres, second cycle 3 acres while the third cycle is limited to 4 acres. The loan has enabled more client farmers to use fertilizer and crop protection chemicals. Survey findings reveal that—

- The proportion of client households using fertilizer increased by 38% from 59% in 2009 to 97% in 2012. This is in comparison to control households where the corresponding increase stands at 14%.
- The actual fertilizer application rate for those clients who use fertilizer was lower than for control households that use fertilizer. This may be related to the fact that a fair proportion of farmers actually have more land under cocoa than the loan will support given the acreage limits in place. This has a tendency to encourage farmers to spread the inputs they get over too large an area.

²⁴ A number of them changed to maize or rice production and came back to Opportunity Bank for loans for those crops the following year.

- Higher proportions of client households acknowledged using crop protection chemicals in both years compared to the control households. The value of pesticides used by client households in production of cocoa in 2012 increased relative to the 2009 levels while it decreased in the case of control households. This implies that client households were able to apply more chemicals so as to better protect the crop from pests and diseases compared to their control counterparts.
- The average value of herbicides used decreased in 2012 relative to the 2009 levels. This may be due to the fact that with time cocoa develops a thick canopy which eventually suppresses growth of weeds. Herbicides were not included as part of the loan package in 2012.

Practice	Control		Client	
	2009 (n=44)	2012 (n=49)	2009 (n=148)	2012 (n=152)
Fertiliser	43	57	59	97
Pesticides	61	80	71	85
Herbicides	27	55	41	39
Average				
Fertiliser application (kg/acre)	65.5	81.9	48.4	61.3
Value of Pesticides (USD)	104.2	81.4	98.4	102.1
Value of herbicides (USD)	92.3	60.4	75.9	55.8
Quantity produced (kg)	892	1,016	1,074	1,359
Quantity marketed (kg)	892	1,016	1,074	1,359
Yield (kg per acre)	143	174	148	190

- Client households had larger average quantities produced and marketed compared to control households in both years. The average quantities produced and marketed increased by 285 kg in case of client households—a figure that is more than double the increase of 124 kg registered by control households.
- Average quantities produced and marketed in 2012 by client households are significantly higher than those registered in 2009. Test for equality of means gave a t-value of 4.5 significant at 1%.
- Average yield levels registered in 2012 by client households are significantly higher than those of 2009. Test for equality of means gave a t-value of 5.4 significant at 1%. The Client households' registered a relatively higher percentage (29%) change in yield in 2012 relative to 2009 levels compared to the control households whose corresponding increase stand at 22%.

Literature has it that bringing new land under cultivation, intensive use of household labor, good rainfall pattern, effectiveness of farm spraying and increased fertilizer use are the key factors that influence change in cocoa production in Ghana.²⁵ Therefore, the relatively large proportion of client households who acknowledge use of fertilizer coupled with increase in value devoted to crop protection chemical seem to account for the difference between clients and control households.

However, poor weather in 2012 coupled with insufficient inputs to cover the farmer's entire field devoted to cocoa appear to have impeded greater increase in quantity produced and yields. It was noted that 2012 was a bad year for weather; hence, much of the main crop failed and farmers had to rely on the fly crop to pay the loan. With regards to insufficient inputs, the average quantity of fertilizer of 582 kg can only cover 3.9 acres accounting for 45% of the 9.5 acres under cocoa in client households. Given the temptation for farmers to spread the fertilizer to cover their entire crop field, this would lead

²⁵ en.wikipedia.org/wiki/Agriculture_in_Ghana

to application rates of 61.3 kg per acre a figure far below the standard recommendation of 150 kg of fertilizer per acre (50 kg NPK/acre and 100 kg/acre of sulphate of ammonia). Likewise, at the standard loan crop protection package of USD 65.7 per acre (insecticide 25.2 and fungicide 40.5) for the year 2011, the average value of USD 102 reported by client households would effectively cover 1.6 acres out of the 9.5 acres devoted to cocoa. The problem of defaults within the group has resulted in some farmers missing out on the chance to get a loan in the next season. This breaks the recommended cycle of 3 years of intensive input use needed to achieve optimal yields.

Maize

The input loan package comprised of seeds, fertilizer (DAP [diammonium phosphate] and sulfate of ammonia), pre-emergent and post-emergent weedicides. The loan has enhanced access to the production inputs. Survey findings reveal—

- Increase in proportion of client households using improved seed, fertilizer and weedicides. Across input categories, higher proportions of client households acknowledge use of purchased inputs in 2012 compared to the control households who report the same.
- The average quantity of fertilizer applied per acre increased by 20.5 kg from 63.2 kg in 2009 to 83.7 kg in 2012. This is in comparison to control households who registered a decrease of 11 kg in average quantity of fertilizer applied per acre in 2011 relative to 2009 levels.
- Client households registered a large increase in average quantities produced and marketed compared to control households. Client households registered an increase of 2,301 kg and 784 kg in average quantities produced and marketed in 2012 relative to 2009 levels respectively. Corresponding figures for the control households stand at an increase of 209 kg and 186 kg in average quantity produced and quantity marketed respectively.
- Average quantities produced and marketed in 2012 by client households are significantly higher than those registered in 2009. Test for equality of means gave a t-value of 5.2 for quantity produced and t=2.6 for quantity marketed both significant at 1%.

Practice		Control		Client	
		2009 (n=21)	2012 (n=23)	2009 (n=81)	2012 (n=84)
Improved seed	Any source	83	91	93	99
	Home saved/donated	81	78	73	60
	Purchased	10	13	26	52
Fertiliser		71	87	75	98
Pesticides		24	22	17	26
Herbicides		52	74	62	75
Average					
Fertiliser application (kg/acre)		69.6	58.6	63.2	83.7
Value of Pesticides (USD)		41.1	32.7	54.9	37.6
Value of herbicides (USD)		45.7	36.6	76.9	54.8
Quantity produced (kg)		6,264	6,472	5,570	7,872
Quantity marketed (kg)		5,969	6,154	5,265	6,049
Yield (kg per acre)		976	1,037	886	1,271

- Client households registered an increase in yield of 386 kg accounting for a 44% increment in yield levels in 2012 relative to the 2009 levels. Corresponding figures for the control households stand at 61 kg accounting for only 6% increment in yield levels relative to the level registered in 2009. The large proportion of client households reporting use of improved seed (notably purchased seed) and fertilizer coupled with application of higher amounts of fertilizer in an acre compared to the control households appear to account for the observed differences in production and yields levels among the two categories of households. However, the bad weather experienced in 2012 coupled with insufficient quantity of inputs to cover the entire maize field hindered realization of greater increases in production and yields that might have been possible. At the standard application rate of 150 kg of fertilizer per acre, the average total quantity of fertilizer reported by client households stand at 552 kg which can only cover 3.7 acres (56%) out of the average of 6.6 acres cultivated by the farmers. Temptation to spread the fertilizer over too large an area limits yield impact.

Chilies

This is a cash loan given to farmers who then decide on the inputs they wish to buy (seeds, fertilizer and chemicals).

- It was noted that many farmers rented land to expand production while others used cash to expand local salt extraction business. Land under chilies increased by 0.7 acres in case of client households compared to an increment of 0.5 acres registered by control households in the same period.
- Although most of the farmers were already using fertilizer and pesticides in production of chilies, client households registered an increase in average quantity of fertilizer applied per acre while the control households registered a decline in quantity.
- The average quantity of fertilizer used was 221 kg and at the standard loan package application rate of 175 kg per acre, the reported quantity is enough to cover only 1.3 acres out of the average of 5.6 acres planted to the crop.
- Client households registered higher quantities produced and marketed in 2012 compared to control households while the reverse was true in 2009. Likewise, client households registered an increase of 330 kg and 292 kg in average quantity produced and marketed respectively while the controls had declines of 38 kg and 12 kg respectively.
- The client households registered a 2% increment in yield in 2012 relative to the 2009 levels while the control households had a 9% decline in yield levels. The increase in area under production, expanded irrigation and quantity of fertilizer used account for the increased production and yields among client households. However, bad weather experienced in 2012 was noted to have limited greater increments in yields.

Table 17. Percent of Households Growing Chilies in Ghana Reporting				
Practice	Control		Client	
	2009 (n=14)	2012 (n=14)	2009 (n=49)	2012 (n=49)
Fertiliser	100	100	98	100
Pesticides	86	86	96	96
Herbicides	21	21	12	14
Average				
Area under crop (acres)	4.5	5	4.9	5.6
Fertiliser application (kg/acre)	31.5	30.2	37.1	41.2
Value of Pesticides (USD)	39.2	45.2	57.0	61.8
Value of herbicides (USD)	27.2	122.5	137.6	124.8
Quantity produced (kg)	1,511	1,473	1,404	1,734
Quantity marketed (kg)	1,327	1,314	1,286	1,578
Yield (kg per acre)	410	373	308	316

It should be noted that the number of control households is too small to register statistically significant findings.

Onions

Onion farmers received cash loans and were allowed to decide the inputs they want to buy with the loan funds. It was noted that many borrowers used loan funds to purchase irrigation pumps or rented land to expand production. Survey findings reveal that—

- There was an increase in the proportion of client households that use crop protection chemicals and weedicides in production of onions in 2012 compared to the situation in 2009.
- Average quantities produced and marketed by client households increased by 1.67 tonnes and 1.51 tonnes respectively. Average quantities produced and marketed in 2012 by client households are significantly higher than those registered in 2009. Test for equality of means gave a t-value of 2.8 significant at 1%.
- Even though client household production and marketing increased significantly, they still produced and marketed less than control households in both periods. We do not have an explanation for this observation. No problems were identified during the focus group discussions that would shed light on the matter. The fact that the control group sample size was very small, however, means that the values can be distorted by a small number of higher producers. This possibility, however, cannot be confirmed. The fact that the control households were all using fertilizer in 2009 and produced significantly more than client households in 2009 suggests that they may have had earlier access to extension support and irrigation.
- Average yields increased by 30% from 1,118 kg in 2009 to 1,456 kg in 2012 in the case of client households while there was a 2% decline in yields registered by control households. Average yields registered in 2012 by client households are significantly higher than those registered in 2009. Test for equality of means gave a t-value of 2.2 significant at 5%. The increased production and yields in client households were attributed to expansion of area under production, expanded irrigation and improved fertilizer application rates.

Table 18. Percent of Households Growing Onions in Ghana Reporting				
Practice	Control		Client	
	2009 (n=16)	2012 (n=16)	2009 (n=33)	2012 (n=34)
Fertiliser	100	100	94	94
Pesticides	100	100	97	100
Herbicides	94	94	85	91
Average				
Area under crop (acres)	4.6	5	4.3	4.8
Fertiliser application (kg/acre)	136.3	157.5	211.6	215.7
Value of Pesticides (USD)	126.9	138.7	192.7	141.0
Value of herbicides (USD)	67.6	76.1	113.6	80.1
Quantity produced (kg)	5,926	6,969	4,146	5,812
Quantity marketed (kg)	3,929	6,568	3,906	5,418
Yield (kg per acre)	1,419	1,392	1,118	1,456

Again, the sample size for the control group for onions is quite small and may not be representative. It should be noted also that all but one of the control onion farmers obtained loans from Opportunity for the coming year (2013).

2.3. Secondary Impacts on Quality of Life

The main focus of the agricultural credit program is on increasing production by facilitating access to improved inputs, extension advice, land, hired labor, and market linkages. The underlying purpose behind the desire to boost production, however, is actually to increase incomes and improve the standard of living and quality of life for African rural smallholders. This is why the study sought to measure the indirect impact of the agricultural credit program on indicators such as economic standing, ability to meet basic needs, access to education and health care, food security, purchase of assets and employment creation.

In each of these areas, the study found that client households were better situated than control households as a result of the improve cash flow resulting from the access to credit. Money is fungible. Access to credit not only generates more income from agriculture, but it also relieves cash flow constraints. This effectively frees up resources when they are needed at critical times to address household emergencies, meet school fee payment deadlines, or invest in small-scale income generating activities. Non-farm activities are important to smooth out family income throughout the year and create an important safety net that can mean the difference between food security and going to bed hungry. The evidence with respect to each of these indicators of quality of life is investigated in depth in the following sections.

2.3.1. Analysis of the PPI

The study analysis shows that the proportion of households that improved their poverty status according to the Progress out of Poverty Index over the four-year period from 2009 to 2013 is significantly higher for client households than for control households. This is a clear indicator that overall the loan program has had a positive impact on standard of living and incomes.

The Progress out of Poverty Index® (PPI®) is a poverty measurement tool developed by the Grameen Bank for organizations and businesses with a mission to serve the poor (Grameen Foundation, 2012). The PPI is statistically-sound, yet simple to use: the answers to 10 questions about a household's characteristics and asset ownership are scored to compute the likelihood that the household is living below the poverty line – or above by only a narrow margin.

It is fortunate that the PPI has been developed and standardized against national level poverty indexes in all three of the countries selected for this study. We were therefore able to incorporate the PPI into each of the country surveys in its entirety, including the existing coding and scoring of the questions. The PPI was collected separately for both 2012 and 2009 in order to enable us to present a before and after PPI score for each country that has value for cross-country comparisons as a proxy for poverty. The respective average scores for each are shown below.

Table 19. PPI Score Change			
		Average PPI 2009	Average PPI 2013
Uganda	Client	53.7	54.4
	Control	54.0	54.0
Malawi	Client	49.0	51.4
	Control	49.1	50.4
Ghana	Client	44.7	46.7
	Control	41.8	42.7
Overall	Client	48.8	50.6
	Control	48.9	49.6

PPI scores range from zero to 100.

While the interpretation of the PPI is not as straight forward as income, for example, in general the higher PPI indicates a greater likelihood of the household being above the poverty threshold, while lower scores indicate a greater likelihood. The complete set of PPI questions and the interpretation sheet for each country are included in Annex 12.

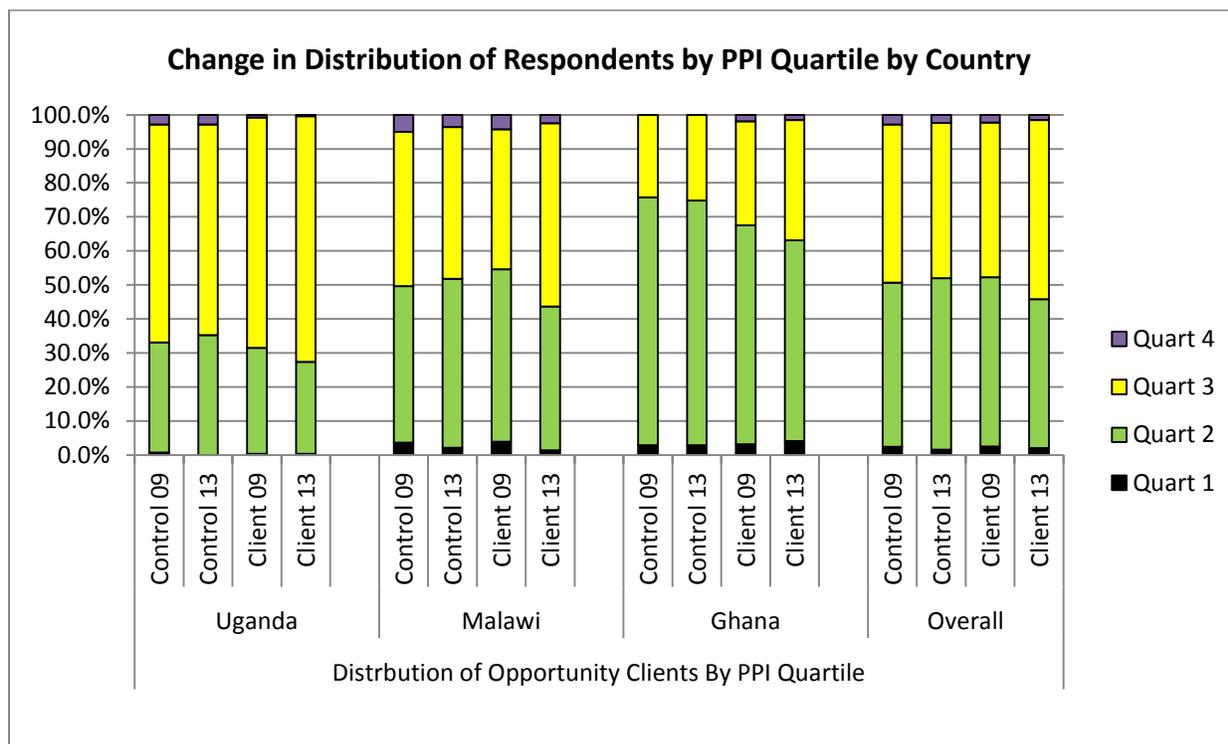
Given that the indicators used in the PPI – marital status, family size, level of education, source of income, type of housing, ownership of assets, and so on – are not things that change easily in a short period of time, we would expect the PPI to be fairly stable over time, representing the poverty status of the household rather than transitory income. Even so, the study clearly found that there was a trend for client households to improve their PPI scores more in the four year interval since 2009 than did control households.

It is useful to summarize PPI information into quartile distributions. Households in Quartile 1 (PPI score of 25 and below) are certain to fall below the national poverty line, whereas those in quartiles 3 and 4 (above 50 and 75 respectively) have virtually no chance of being below even 200% of the poverty line. It is the households in quartile 2 who are the most in question – essentially those on the margin.

What is interesting in this study is that the proportion of households whose status shifted from one quartile of the PPI to another was greater for client households than for control households as indicated in the graph below. Most of the shift was for client households moving from the second quartile (which is marginally above the poverty line) up into Quartile 3—which is more solidly middle class, although there were some cases observed where households that were originally in quartile 3 or 4 actually fell a quartile. This was especially true for control households in Malawi. Overall, for control households the proportion that fell a quartile actually more than offsets the proportion that rose. The shifts in quartile PPI status are summarized in the following table.

Table 20. Proportion of Households Changing PPI Quartile		
Nature of Change	Control	Client
Declined	8.7%	5.2%
Stayed Same	83.7%	83.5%
Climbed	7.6%	11.3%

Figure 11. Change in Distribution of Respondents by PPI Quartile by Country



Observation: Generally speaking, PPI scores were highest in Uganda and lowest in Ghana. The study analysis shows that the proportion of households that transition out of Quartile 2 and into Quartile 3 over the four-year period from 2009 to 2013 is significantly higher for client households than for control households. This is a clear indicator that overall the loan program has had a positive impact on standard of living and incomes.

2.3.2. Trends in Farmer Incomes and Livelihoods

Overall, the study found that client households are happier with their financial situation in 2012 than are control households. They reported a greater improvement in their economic standing in the community, and greater ability to meet their basic expenditure requirements.

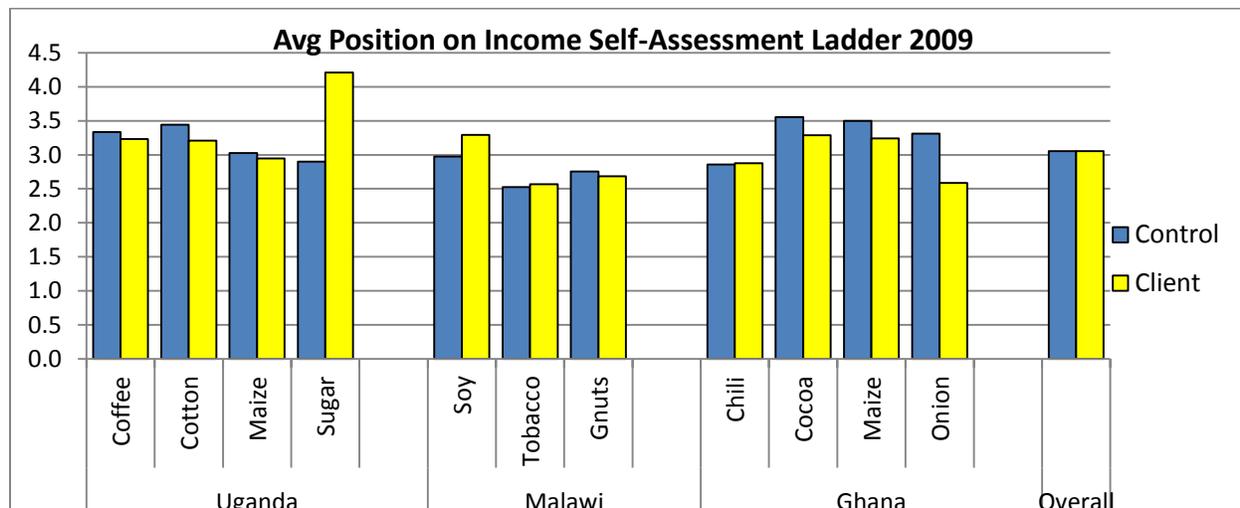
Respondent Self-Perceptions of Change in Income

The general perception that client households are overall better off in 2013 than they were in 2009 is confirmed by the analysis of perceived changes in income. The analysis is depicted in the graph below. Basically, it shows that the proportion of client households who perceive their financial position to be better than it was in 2009 is consistently higher than it is for control household across all countries with the largest difference perceived in Ghana.

Respondents were asked to rate themselves on a ladder from 1 to 10, with 1 being the poorest people in their community and 10 being the richest. Most respondent households rated themselves at level 3 in 2009 on average (both client and control). When the data is broken down by crop, however, we see that

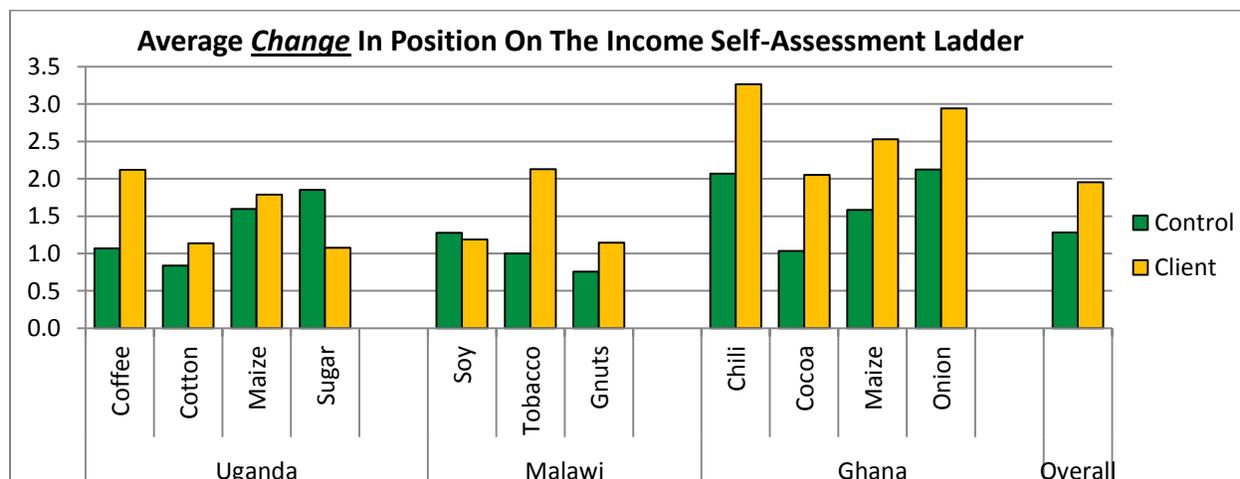
for most crops the control households actually rated themselves higher than the clients in 2009. This trend is offset on average, by the significant difference in ratings for the sugar producers. The client sugar producers tended to rate themselves much higher than the control households in 2009.

Figure 12. Average Position on Income Self-Assessment Ladder in 2009



When asked to do the same rating for 2013, overall the clients perceived a greater improvement in their economic standing than did control households. The average change in standing, broken down by country and crop, is depicted in the graph below. The notable exceptions to this trend can be seen with respect to sugar producers who have not yet sold their sugarcane because of delays in the factory opening, and soy producers who defaulted after a bad production year. While there is little improvement expected for the soy farmers, most of whom left the program, there is a good chance the sugar producers will recover once the crop is sold, and be well positioned to profit from the ratoon crop.

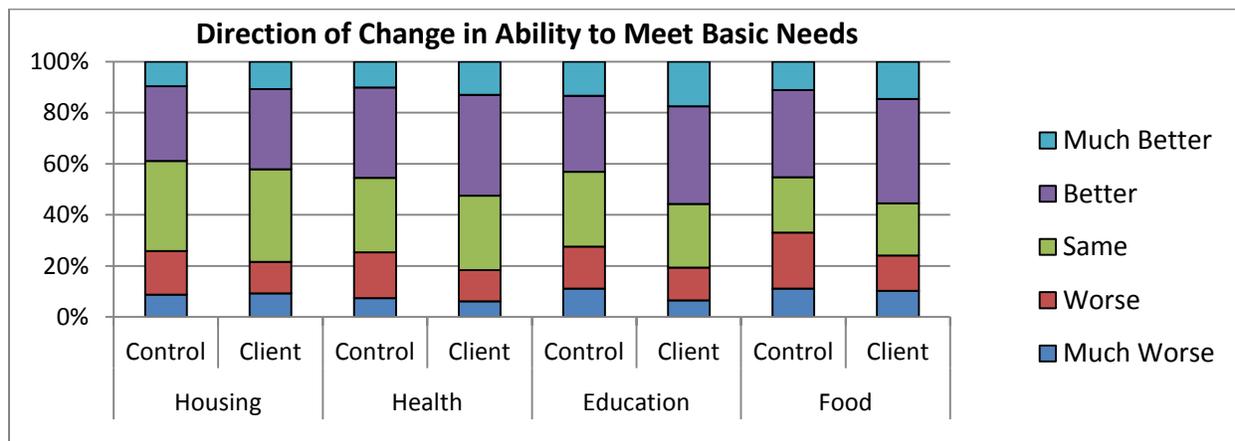
Figure 13. Average Change in Position on the Income Self-Assessment Ladder



The general perception that client households are overall better off in 2013 than they were in 2009 is confirmed by the analysis of perceived changes in difficulty in meeting household expenses for basic needs. The analysis is depicted in the graph below. Basically, this shows that there is little difference for

something enduring like housing conditions, which do not require continuous expenditure for most households that own their own modest dwelling. In contrast, when it comes to education and food expenses, which are perceived as both urgent and pressing, client households report their situation as having improved much more than that reported by control households.

Figure 14. Direction of Change in Ability to Meet Basic Needs



Respondent Sources of Income

The following table presents the information on household sources of income. There was no significant difference in the number of income sources for client and control households. It was differences in the relative importance of different income sources between countries that proved most notable. While crop and livestock production were the top two contenders in all three countries, livestock proved much more important in Uganda where dairy production is a major activity, and much less so in Ghana. Produce trading is an importance third in Uganda, but hardly features at all in Ghana. Petty retail trade falls third in both Malawi and Ghana but fourth in Uganda.

Ten Most Important Sources of Income by Country

Table 21. Ten Most Important Sources of Income by Country								
Uganda (n=410)			Malawi (n=421)			Ghana (n=424)		
	Number	%		Number	%		Number	%
Crop Prod.	407	99.3%	Crop Prod.	418	99.3%	Crop Prod.	424	100.0%
Livestock	264	64.4%	Livestock	196	46.6%	Livestock	154	36.3%
Produce Trade	124	30.2%	Petty Trade	61	14.5%	Petty Trade	112	26.4%
Petty Trade	89	21.7%	Produce Trade	52	12.4%	Selling Food/Drinks	45	10.6%
Selling Food/Drinks	37	9.0%	Selling Food/Drinks	43	10.2%	Produce Trade	29	6.8%
Salaried employment	34	8.3%	Salaried employment	23	5.5%	Services	28	6.6%
Construction	30	7.3%	Transport	15	3.6%	Non-Ag Labor	25	5.9%
Transport	28	6.8%	Firewood/charcoal	15	3.6%	Construction	22	5.2%
Rental	25	6.1%	Bricks	14	3.3%	Transport	19	4.5%
Brewing	18	4.4%	Construction	13	3.1%	Salaried employment	17	4.0%

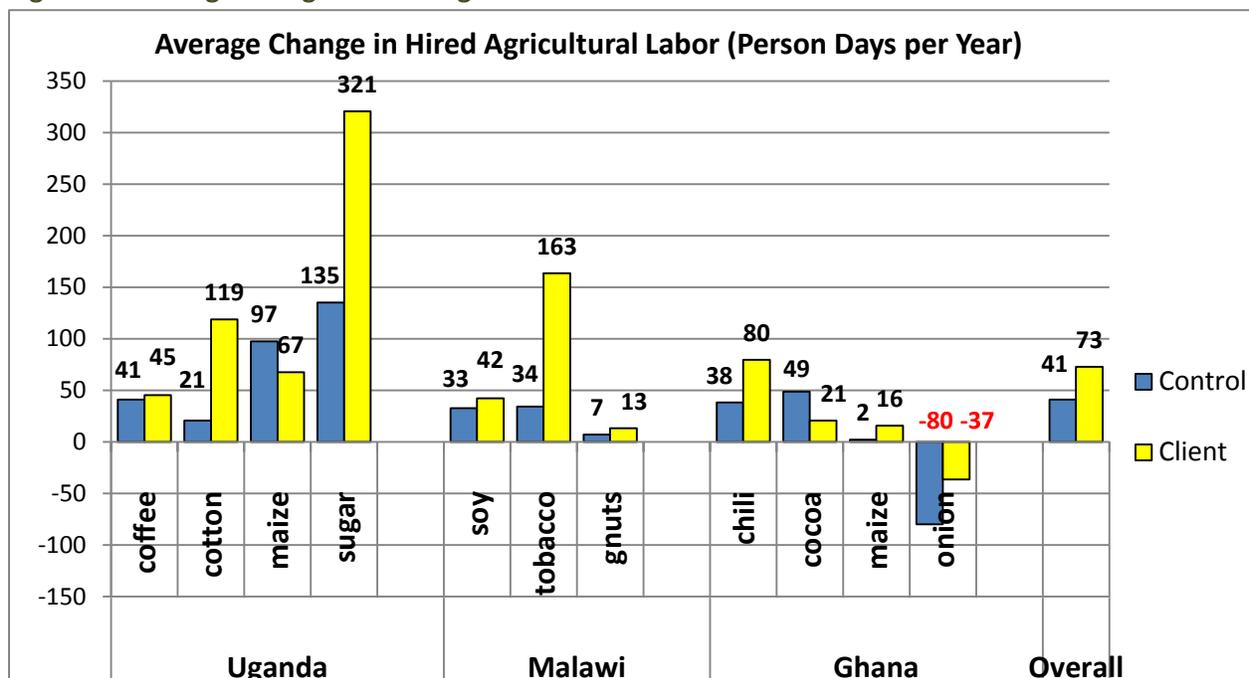
Note: Multiple sources of income apply. Both clients and control households reported an average of 2.4 sources of income.

2.3.3. Estimations of New Jobs Created By/For Farmer Clients

Overall, the study found that client households generated more employment both on-farm and off-farm than did control households. In this way the benefit of the agricultural finance program are extending into the broader community through a multiplier effect.

As mentioned previously, many clients used loan resources to hire labor. The results with respect to change in use of hired agricultural labor between 2009 and 2012 are mixed. Overall, clients increased their use of hired day labor more than did control farmers. This is especially true for sugar, tobacco, and cotton farmers. In contrast, maize producers in Uganda and cocoa farmers in Ghana increased their hired labor by less than did control farmers, and onion producers actually used less hired labor in 2012 (though not as much less as for control farmers), a result that is partly explained by the shift to use of herbicides.

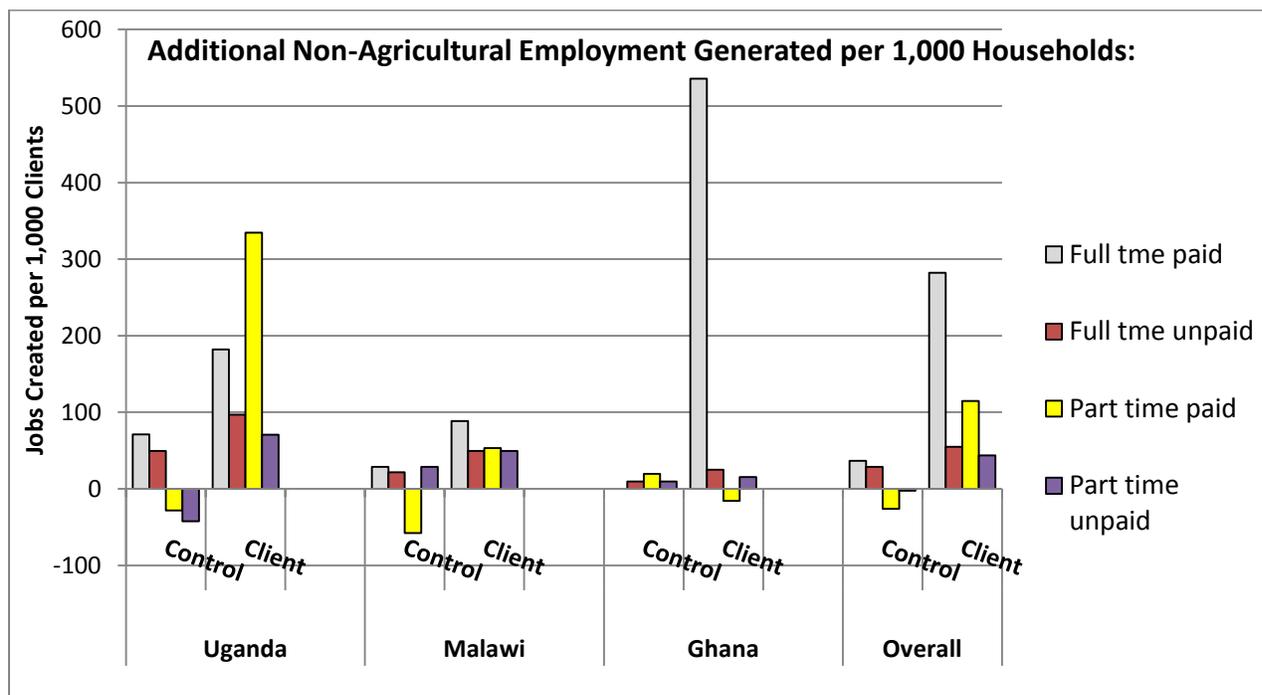
Figure 15. Average Change in Hired Agricultural Labor



In addition to the employment of daily agricultural labor illustrated above, many of the clients and control households have non-farm enterprises of various kinds that also employ people. Survey respondents were asked if their non-farm enterprises had any employees and whether the number of employees had changed since 2009. The graph below clearly demonstrates that the change in employment by client owned enterprises since 2009 was significantly higher than that of control households.

Not only did more client households employ additional nonfarm labor in 2012 (14% of client households compared to 8% of control households), the number of employees was also larger.

Figure 16. Additional Non-agricultural Employment Generated



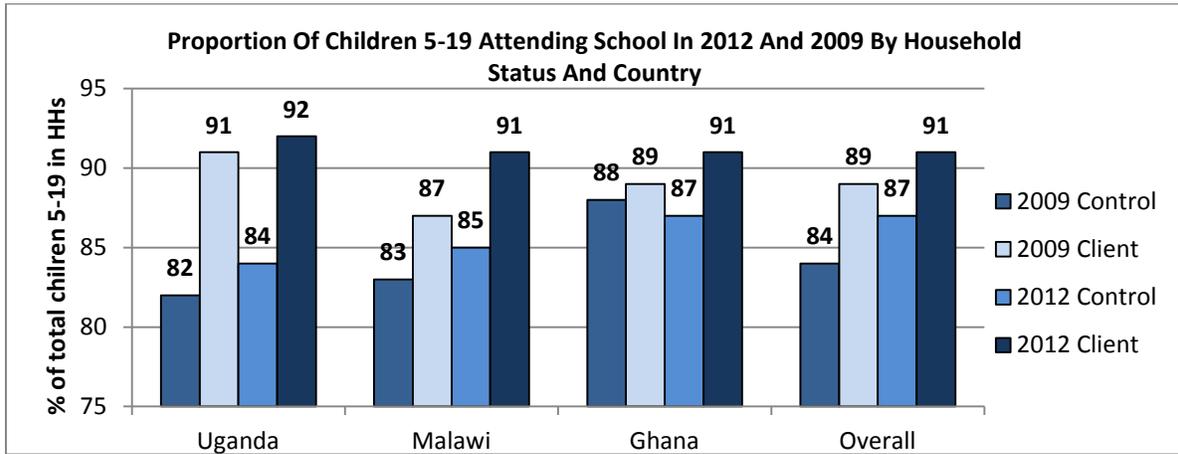
2.3.4. Changes in School Attendance for Children

The agricultural finance program was perhaps most appreciated by clients for its contribution to education. For 91% of the clients, all school age children were in school in 2012 compared to 87% for control households. Clients were found to have reduced the number of school days missed as a result of late payment of school fees more than did control households, and were more likely to report that they are better able to meet educational related expenses than in 2009.

The survey sought information on whether children of school going age (5-19) were in school, the type of school attended (private or public and day or boarding); the average number of days in a year children missed school due to late settlement of school dues and level of difficulty in providing for educational expenses. Households provided information for 2012 and 2009. Proportion change in the percent of households with children in private and boarding schools, average number of school days missed, and households who find difficulty in providing for education were used as additional proxy measures for improvements in education for children. Findings reveal that—

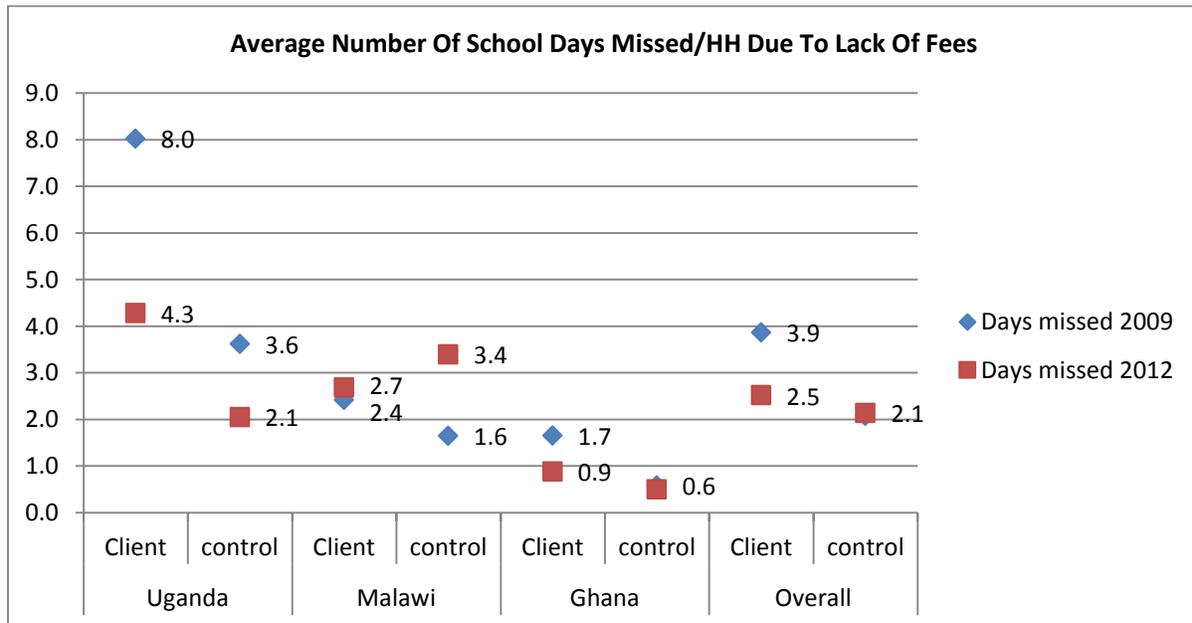
- i. The proportion of children 5-19 attending school increased in 2013 compared to 2009. With the exception of Control households in Ghana that registered a decrease in the proportion of children 5-19 in school, the increasing trend is consistent across the 3 countries (Figure 16).

Figure 17. Proportion of Children 5-19 Attending School in 2012 and 2009 by Household Status and Country



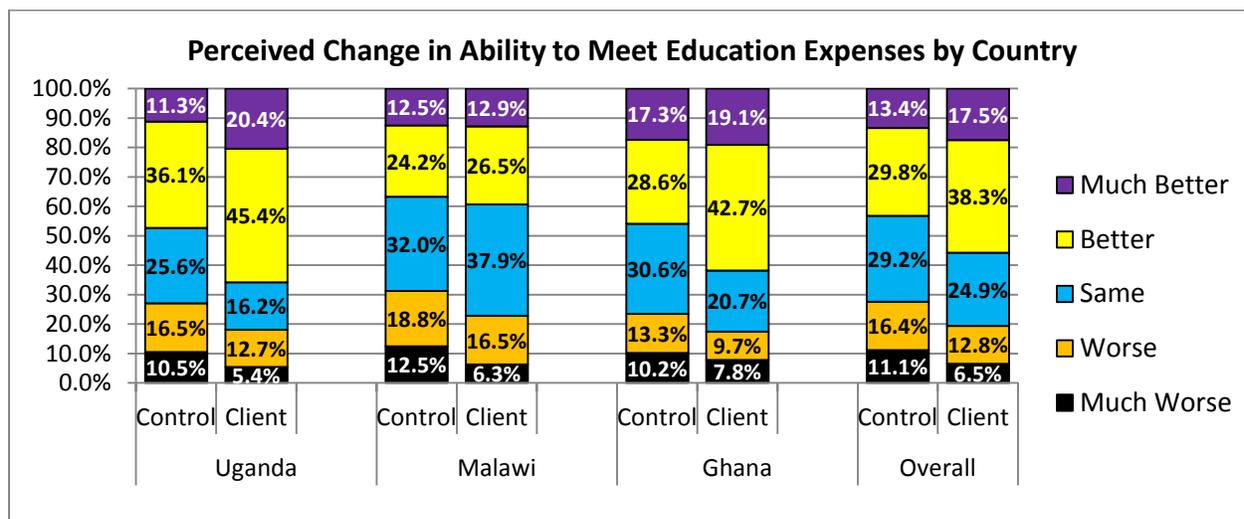
- ii. For client households, in all countries the average number of school days missed in 2012 was less than in 2009. This is in contrast to control households where there was minimal change and in the case of Malawi the number even increased. (Note: Where there is only one number indicated, it means that the average was the same in both years.)

Figure 18. Average Number of Days Missed per Household (HH) Due to Lack of Fees



- i. Overall, clients were much more likely to report an improvement in the household's ability to meet educational expenses in all countries, although the difference with control households was smallest in Malawi. The results are illustrated below:

Figure 19. Perceived Change in Ability to Meet Education Expenses by Country



Additional information on the number of children attending private and boarding schools and level of difficulty in meeting other education expenses such as scholastic materials and lunches is presented in Annex 14.

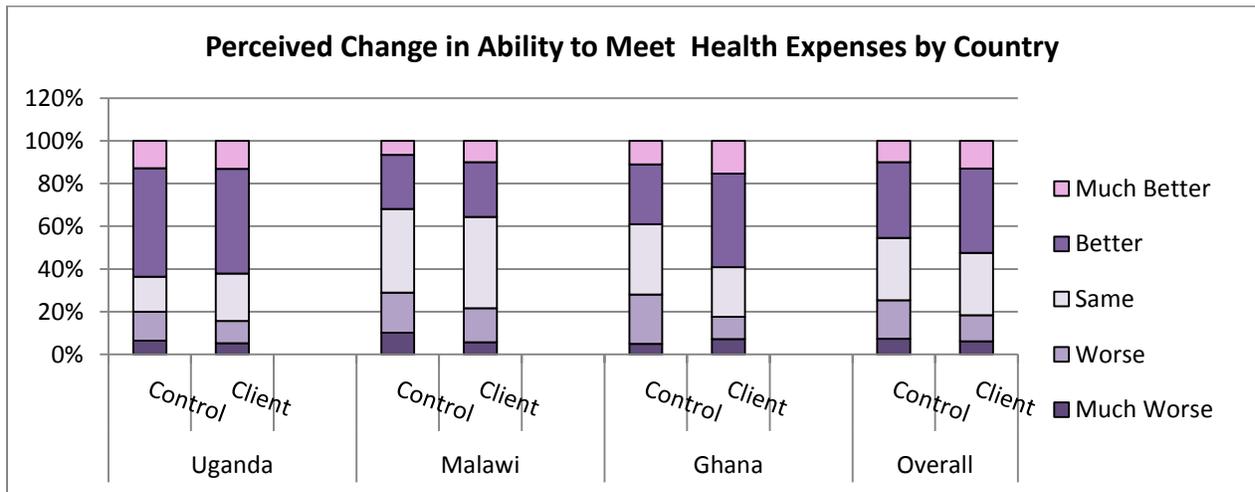
2.3.5. Changes in Access to and Use of Healthcare Services

Overall, Opportunity clients were found to be significantly more likely to report improved access to health care and greater ability to meet health care expense than were control respondents. Very significant differences were observed between countries, however, as a result of differing government policies and approaches to health care.

With regard to healthcare, the survey sought to understand the respondent's assessment of changes in access to health care services for the wider community as well as for their particular household since 2009. This was supplemented with questions about level of difficulty in meeting healthcare-related expenses such as medicine and transport and the extent to which medical-related debts was a problem for the household. Lastly, the proportion of medical services that the household obtained from private providers as compared to public hospitals and clinics and traditional medicine was ascertained for 2009 as well as 2012.

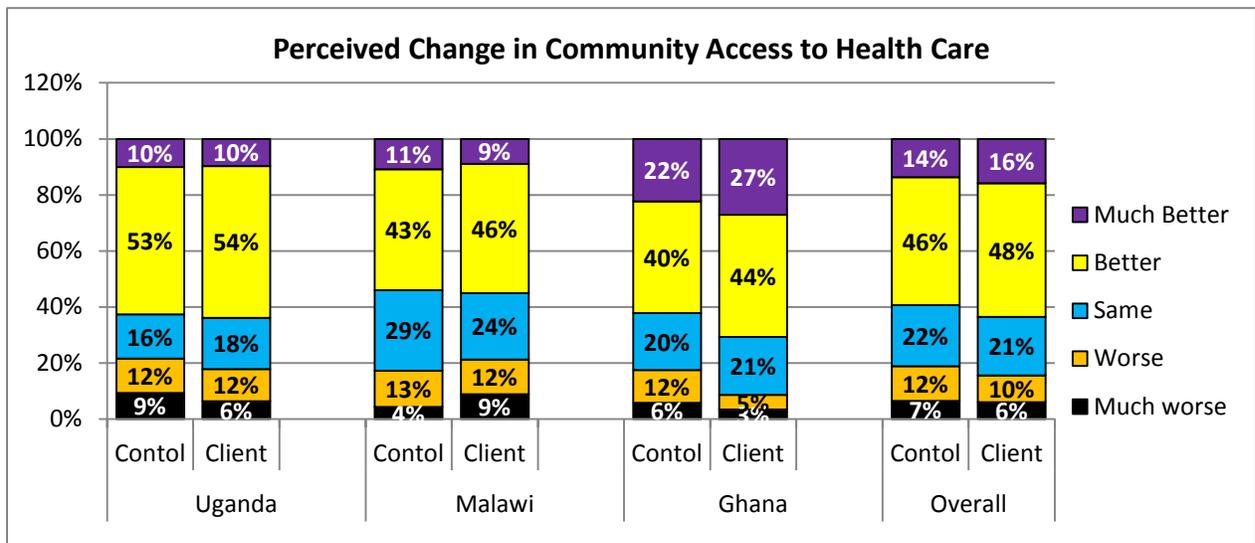
The results show that, overall, clients were more likely to indicate an improvement in ability to meet health-related expenses than control respondents, although the difference was more striking in Ghana and almost imperceptible in Uganda. Country level differences are affected by the state of national health care services.

Figure 20. Perceived Change in Ability to Meet Health Expenses by Country



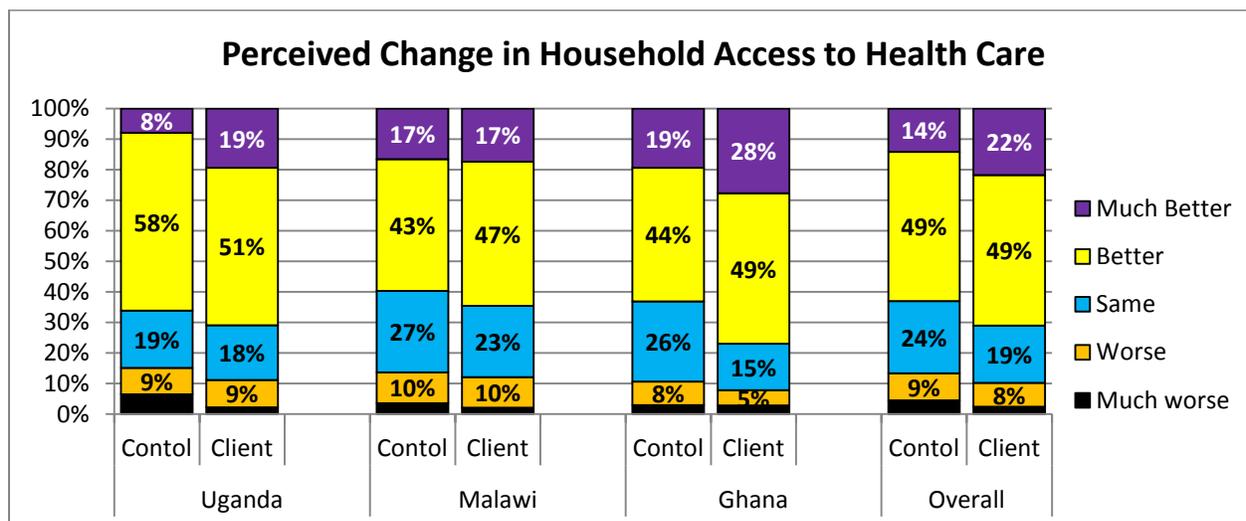
Because the ability to meet health care expenses is inextricably intertwined with both changes in government policy and provision of services, as well as potentially catastrophic and unpredictable individual household events, it was important to put this assessment into a national context. When asked to what extent the broader community's access to healthcare had changed, the vast majority (over 60%) of all respondents, client and control alike said the situation had improved since 2009 with clients having a more positive assessment in Ghana.

Figure 21. Perceived Change in Community Access to Health Care



In terms of their own household's access to healthcare, in all three countries, a larger proportion of clients than control said the situation had improved, and in all three countries the perception of change for household access was better overall than that for community access.

Figure 22. Perceived Change in Household Access to Healthcare



The same trend can be seen in terms of the level of difficulty in meeting other health-related expenses, with client households being better off than control households. There was no discernible difference in the choice of type of medical care provider used by clients and control households over the two time periods. This information is presented in Annex 15.

2.3.6. Perceived Impact on Household Food Security

The Opportunity Bank clients reported a greater reduction in the number of hungry days per year than did control households. They also reported greater improvement in their ability to meet food related expenses in 2013. The change in food security status was less obvious. In 2009, the proportion of clients who were severely to moderately food insecure was slightly higher (53%) than for control households (52%). By 2012, that proportion had fallen to 49% for clients and 51% for controls. These observed positive changes in food security are not directly related to the increased production of food crops. Rather, the loans support primarily production of cash crops which provide income to purchase the household's preferred types of foods.

Food security is defined as a state in which “all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life” (USAID, 1992). Because it is a complex, multidimensional concept, measuring food insecurity has been an ongoing challenge to researchers and practitioners alike.

For purposes of this study we used a slightly modified version of the Household Food Insecurity Access Scale (HFIAS) which was developed for USAID Food and Nutrition Technical Assistance Project (FANTA). The advantage is that this is a standard methodology for measuring the severity of food insecurity and provides a standardized index that can be compared across countries without having to engage in the elaborate process of actual consumption tracking.

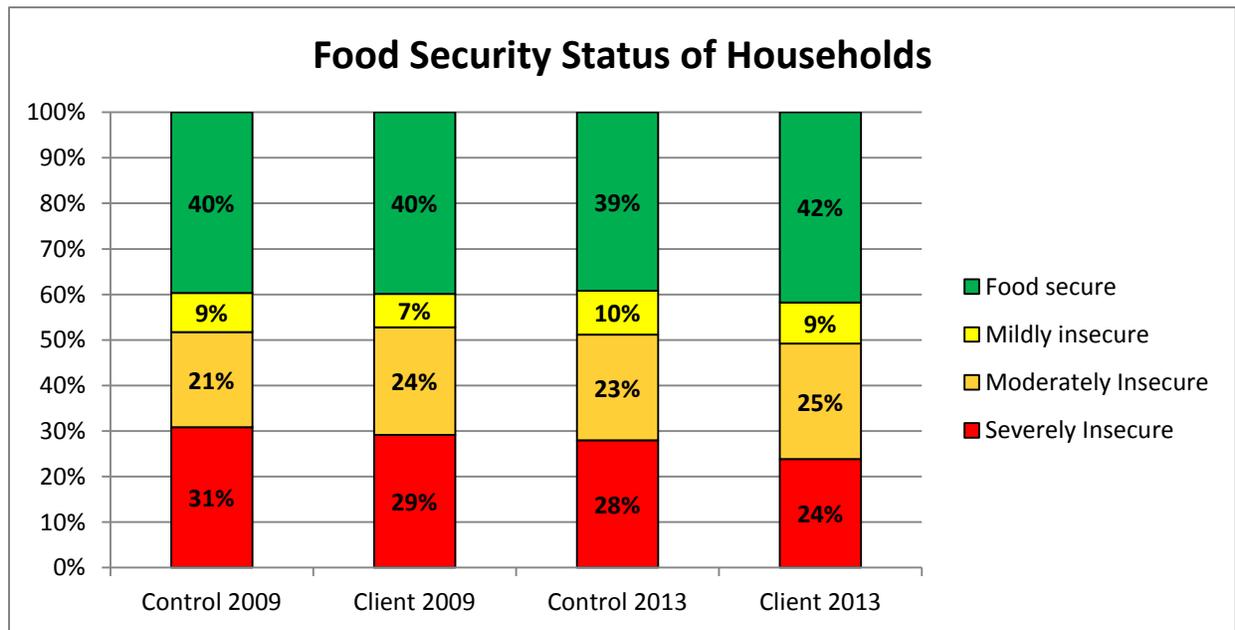
The HFIAS is a set of nine questions that represent apparently universal domains of the household food insecurity (access) experience and can be used to assign households and populations along a continuum of severity, from food secure to severely food insecure. The information generated by the HFIAS can be

used to assess the prevalence of household food insecurity (access) (e.g., for geographic targeting) and to detect changes in the household food insecurity (access) situation of a population over time (e.g., for monitoring and evaluation). An index which combines the intensity and frequency of the food insecurity experience is formulated which can then be compared across individuals, countries and time periods.

While the HFIAS is normally conducted by only asking questions about the previous one month, this approach does not take into consideration the highly seasonal nature of food insecurity in agricultural communities in Africa, where the experience of the "hungry season" just prior to the next harvest is widely documented. Given that the agricultural calendars differ from country to country based on agro-climatic conditions, it is not reasonable to assume that the data collection period for this survey will coincide with the same point in the food security cycle in all countries. It is for this reason that respondents were asked to recall the previous "hungry season." This is a widely accepted practice when dealing with agricultural communities in developing countries.

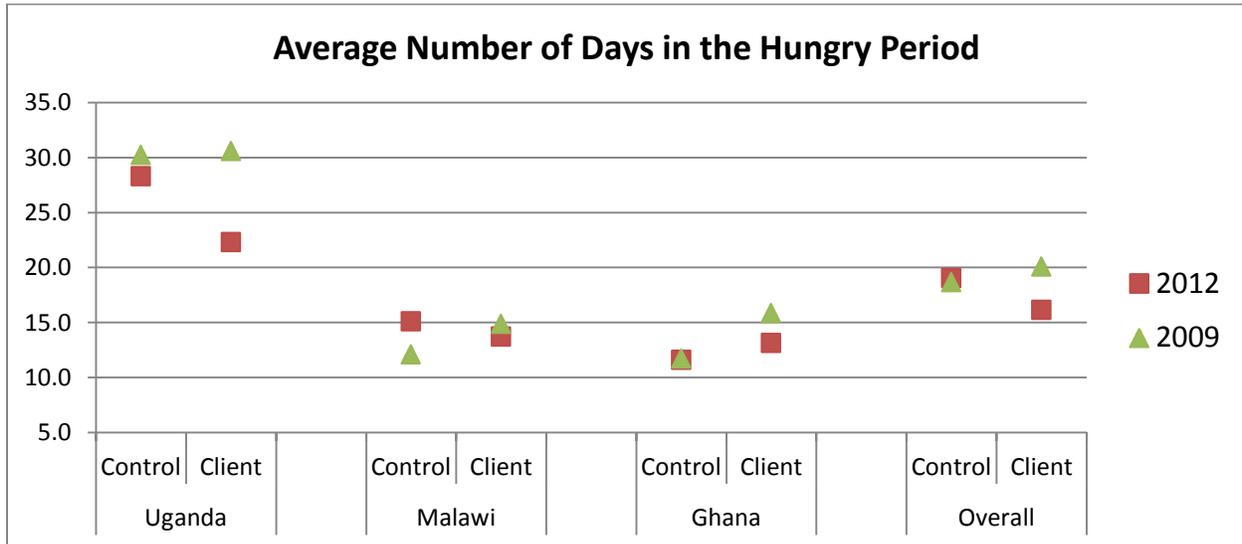
The HFIAS is used to categorize households as to their level of food insecurity. The study results found that clients were slightly more food secure than the control respondents 2012, although their distribution was almost identical in 2009. Basically, taking an agricultural loan did not affect the household's food security classification. The differences between countries are explored in more detail in Annex 16, but basically, Malawi tended to have more highly food insecure households, while Ghana had relatively more households that were food secure.

Figure 23. Food Security Status of Households



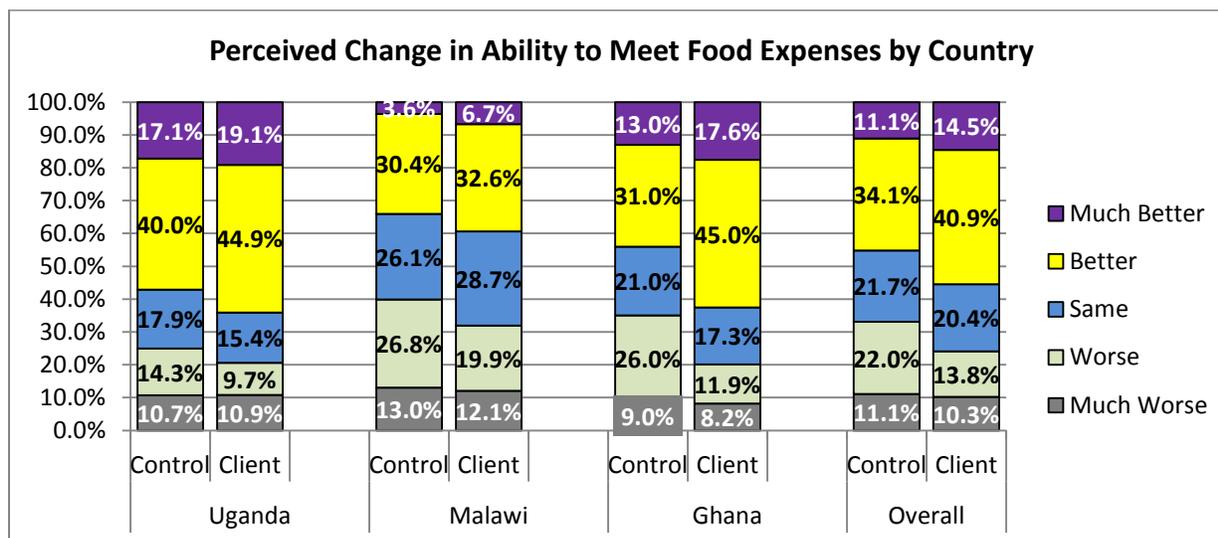
The other standard measure that was employed was self-reporting of the number of days of food shortage in the previous "hungry season." When this is compared with the recall for the 2009 period it provided us with a quantitative measure of the respondent's perception of change in food security over time. The comparison of results on the number of days in the hungry season between the control and client groups is presented below. It can be observed that on average the number of hungry days declined significantly for client households in 2012 while overall the number for control households either stayed the same or, in the case of Malawi, even increased in 2012.

Figure 24. Average Number of Days in the Hungry Period



For most households in Africa, food security is a function of the households' ability to be self-sufficient in food production. These results show that participation in the agricultural loan program, which tended to increase the household's emphasis on commercial agriculture and production for market rather than home consumption, did not have a negative impact on household food availability. The reverse of the question then, is whether increasing commercialization might even improve the households' ability to purchase food, resulting in a more varied diet and greater ability to consume preferred foods rather than simply eating what is produced. The question about perceived changes in ability to meet food expenses seeks to address this question. The results, shown below, indicate that overall a larger proportion of clients (55%) said they were better able to meet food expenses in 2012 compared to control respondents (45%). This was most significant in Ghana, but held true across all three countries. It is important to note that Malawi has had a food crisis over the last year – with over 2 million households being declared food insecure by the government out of a population of 13 million. Coupled with the huge devaluation of the currency and rising cost of food, it is not surprising that a higher proportion of both clients and control households in Malawi reported that ability to meet household expenses is more difficult in 2012, but even in this case client households are still better off.

Figure 25. Perceived Change in Ability to Meet Food Expenses by Country



During focus group discussions most clients acknowledged a positive change in food security – but the change was not directly related to the production of food crops. The loans supported primarily production of cash crops which provided income to purchase the household's preferred types of foods.

2.3.7. Changes in Household Assets

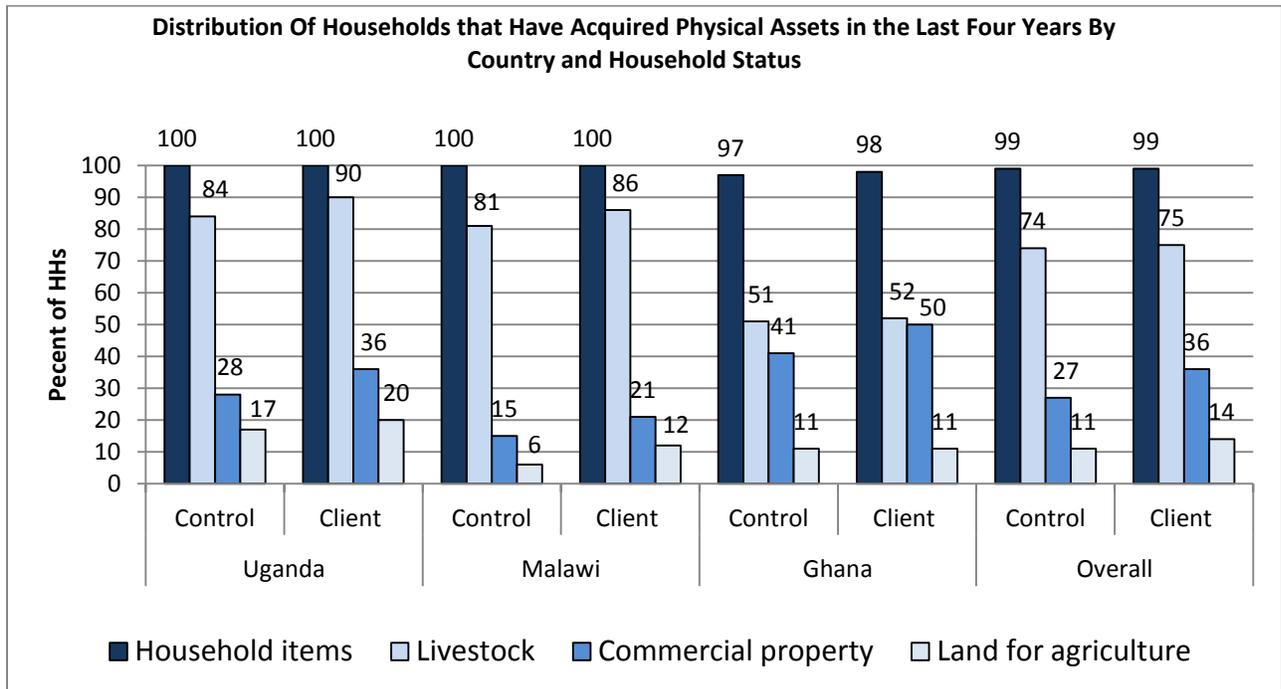
The study found that the proportion of clients who reported acquiring commercial property, and livestock over the last four years was greater than for control households. The number of livestock was also greater. The difference in household assets was less noticeable. Unfortunately, the purchase of productive assets like spray pumps, irrigation pumps, protective gear, and mist blowers that were frequently mentioned by clients during focus groups discussions was not adequately captured in the survey due to problems with enumerator interpretation of the term "household assets."

To measure changes in household assets, the survey sought information on household acquisition of commercial property (plots of land, and commercial buildings), land for agriculture, household items and livestock. The proportion of client and control households that have acquired assets and the average numbers acquired have been used to assess changes in household assets. Findings reveal that—

- Overall, relatively higher proportions of sampled client households acknowledged acquiring commercial property, land for agriculture and livestock compared to the control households (Figure 25).
- Overall, household acquisition of commercial property was strongly associated with household borrower status (Chi-square test $X^2 = 10.2$ significant at 1%) while it holds true for acquisition of livestock in Uganda (Chi-square test $X^2 = 2.9$ significant at 10%) but not in Malawi and Ghana. However acquisition of goats and pigs was skewed towards client households in Malawi, Chi-square test $X^2 = 4.1$ for goats and 3.7 for pigs both significant at 5%.
- On average, client households acquired more animals compared to the control households across the three study countries.

- There were no significant differences observed with respect to acquisition of household items. Unfortunately, productive assets like spray pumps, irrigation pumps, protective gear, and mist blowers that were frequently mentioned during focus groups discussions were not adequately captured in the survey due to problems with enumerator interpretation of the term "household assets."

Figure 26. Distribution of Households that Have Acquired Physical Assets in the Last Four Years by Country and Household Status



2.4. Age and Gender Implications

The study found that participation in agricultural lending enhanced women's empowerment over decision-making and control of resources. Women borrowers performed significantly better than women in the control group. However, their well-being status did not increase as much as it did for male clients. Female-headed households performed worse than male-headed households across most indicators, for both client and control groups, but there is clear evidence that access to agricultural finance significantly narrows the gap.

Considerations of Youth

Relatively little progress has been made in meeting the special needs of younger adults. Less than 3% of all clients fall into the category of "youth" if youth is defined as those under 25 years of age. When the more widely accepted African definition of youth as under 35 years is used, the proportion rises to 21% of male borrowers and 26.3% of female borrowers. Most of these are in quick-maturing crops. Many youth rent the land on which they cultivate, because they do not have sufficient land of their own. Focus groups identified access to land, lack of collateral, and lack of guarantors as the major constraints to access to credit for younger people. Because young people are more mobile, with fewer ties keeping them in the community, they are often excluded by the groups who fear to guarantee them.

Considerations of Gender

It is widely recognized that women face additional challenges in agriculture because they generally have fewer resources at their disposal, lack control over land, finances and decision-making, and have less access to extension support. It is for this reason that many NGO and micro-finance interventions have focused exclusively on women's economic and social empowerment.

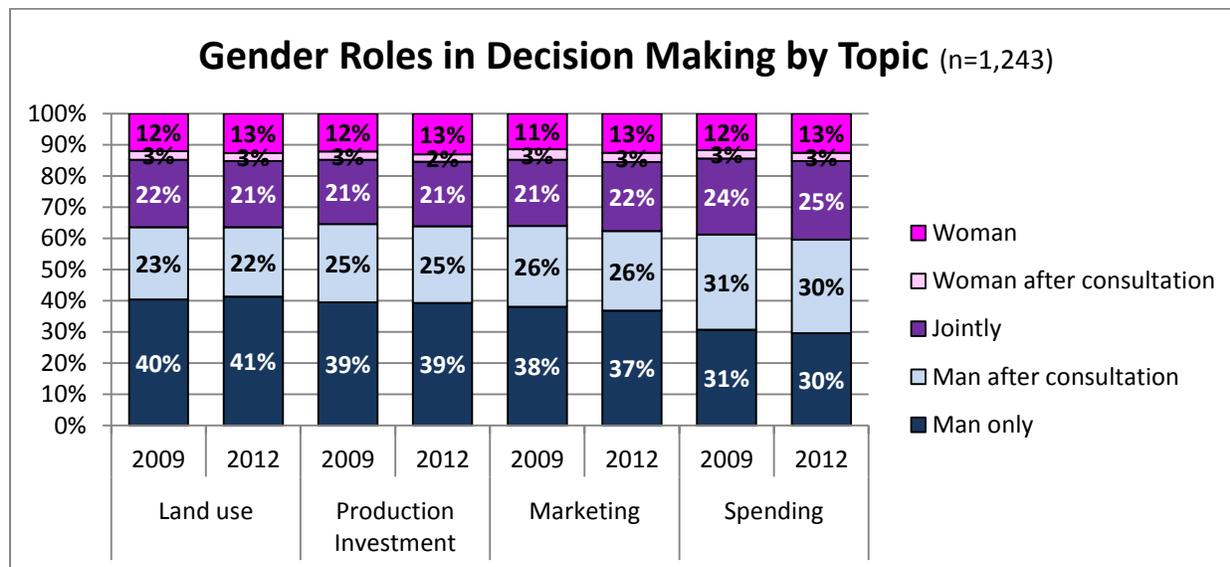
While Opportunity does not have any products exclusively targeted to women, a significant proportion of Opportunity's clients are women. Analysis of the client database of matured loans indicated that the Opportunity portfolio comprised about 32% of borrowers in Ghana, 33% in Malawi, and 22% in Uganda. A large proportion (35%) of the women borrowers tends to be female heads of households with dependents.

To assess the level of women's empowerment in decision making related to agriculture, survey respondents were asked who makes a range of decisions including, the use of land, the level of investment in inputs, how and when to market the product and how to spend the returns of produce sales. The range of options they were to choose between included the following: *1=Husband decides alone; 2=Husband ultimately decides after consultation with wife; 3=They decide Jointly; 4=Wife ultimately decides after consultation with husband; 5= Wife decides alone.*

Africa is still a bastion of male dominance in decision-making. The preliminary results, as illustrated in the graphs on the following page, reveal very little difference in the level of women's empowerment between 2009 and 2012, nor is there much difference according to the topic of the decision, although there is a slightly greater tendency to consult the woman on decisions regarding spending and less on the use of land. Over 60% of decisions are made by the man of the house, who may or may not consult his wife. By contrast, only 14 to 16% of all decisions are made by the woman. Given that the overall sample included 9.8% female-headed households, who have exclusive responsibility for their agricultural

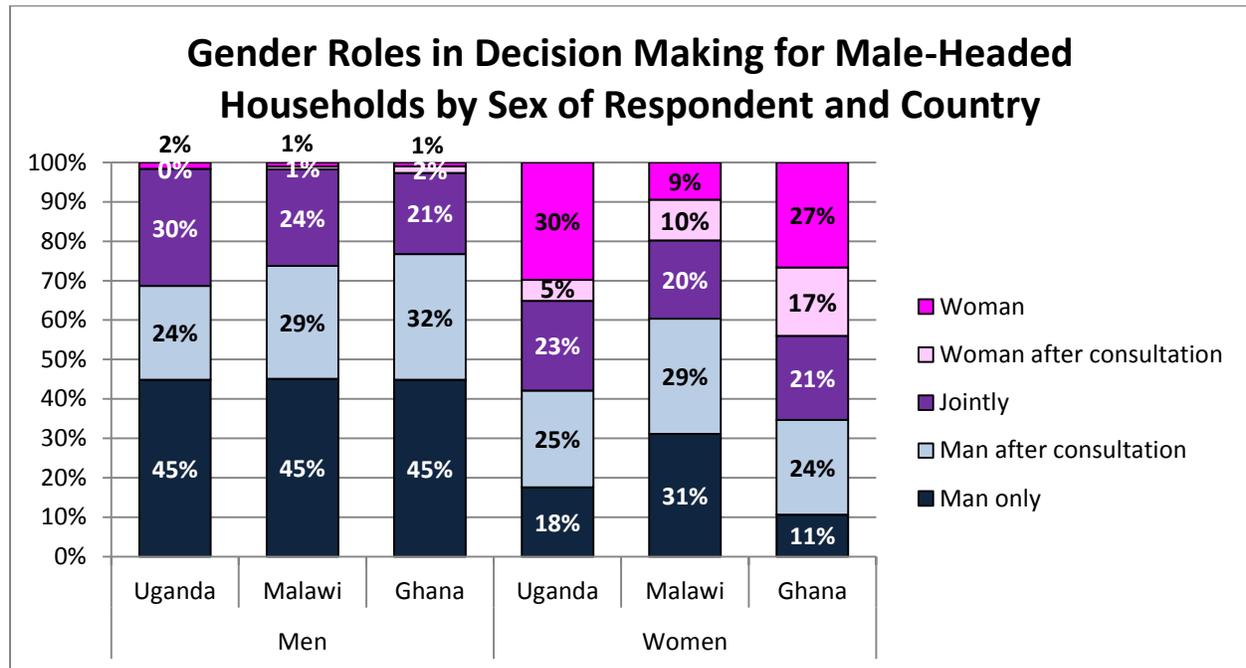
decision-making, this does not say much for the level of women's empowerment in male-headed households.

Figure 27. Gender Roles in Decision Making by Topic



Further analysis reveals, however, that there is considerable difference between the study countries. Women are much more empowered to participate in decision making in Ghana, and far less so in Malawi, with Uganda in the middle. The following graph also clearly shows that the assessment of the situation is considerably different when responses are segregated according to the sex of the respondent—even when only respondents from male-headed households are considered. Clearly women borrowers and women who are participating in agricultural activities and were identified as control respondents by Opportunity's partners feel they have a greater degree of decision making autonomy over their own agricultural production than their male counterparts report in their households. We either have a case of different interpretation of the same process depending on who is observing - or - a division of household decision making with men taking full control of their own fields, and some women controlling their own fields, while others more inclined to leave decisions to the man of the house.

Figure 28. Gender Roles in Decision Making for Male-headed Households by Sex of Respondent and Country



Further disaggregating the data to look separately at clients and control households (again including only those respondents from male-headed households) shows that women clients feel more empowered in their decision making than do women from control households. This is definitely not acknowledged by the men borrowers, who are somewhat less willing to consult their wives on agricultural decisions than are the men from the control group. One might even conclude that having a loan makes both husbands and wives less willing to consult their spouse on decision making than they might otherwise.

Figure 29. Gender Role in Decision Making for Clients in Male-headed Households by Sex of Borrower

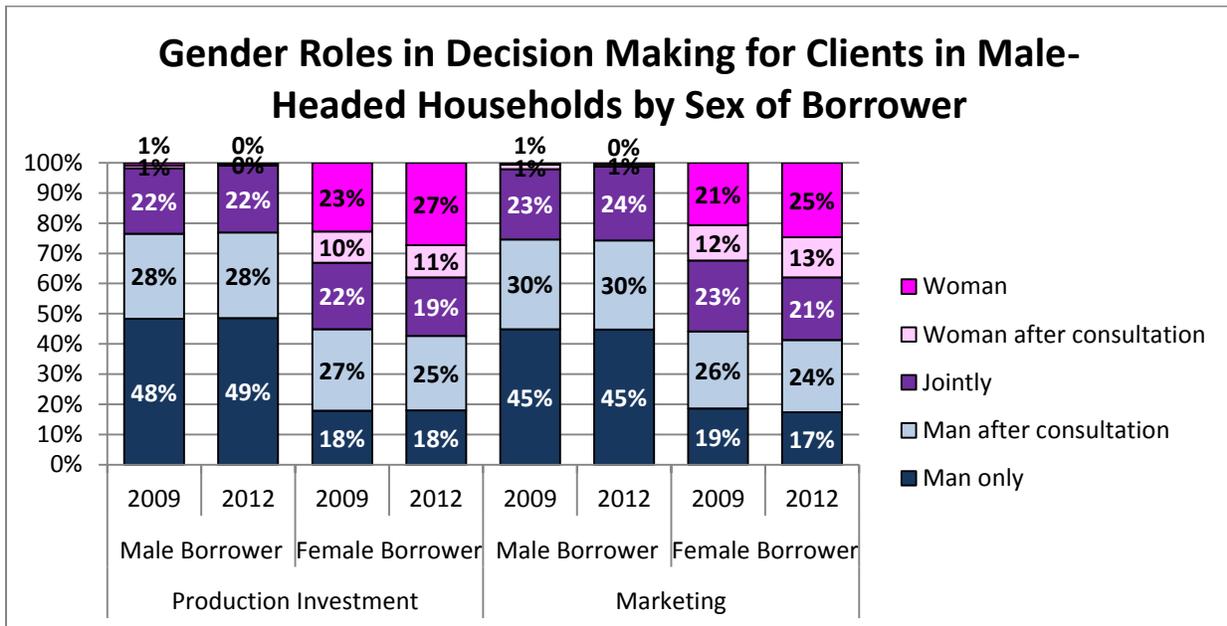
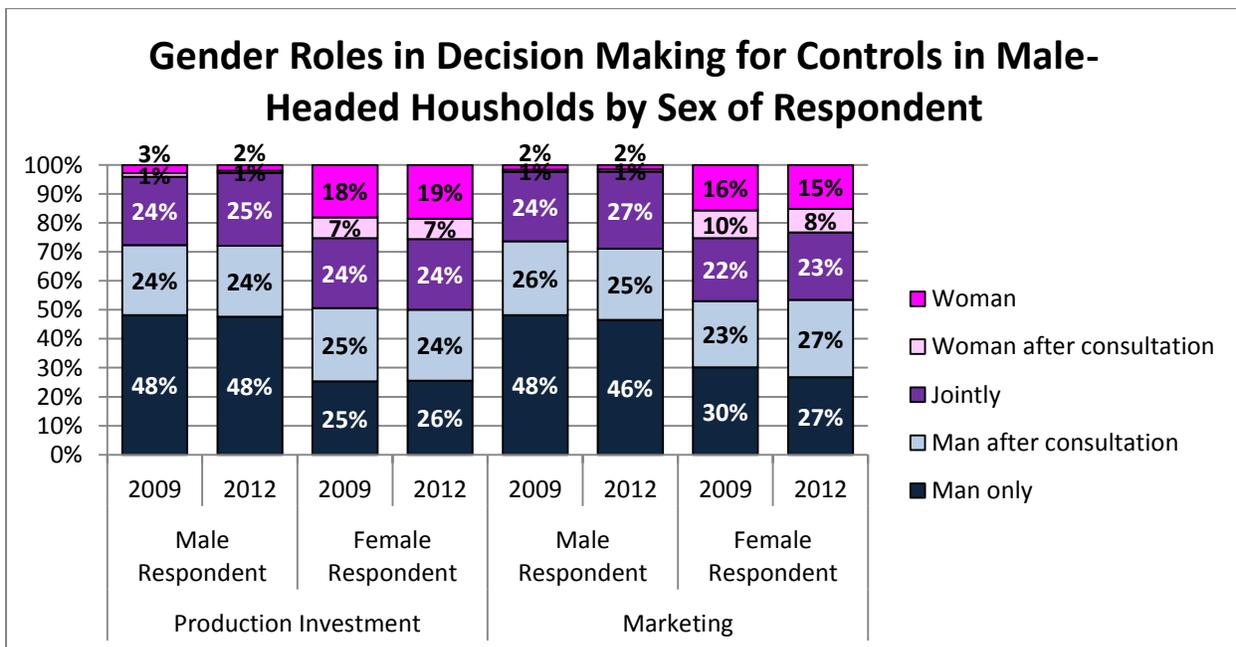
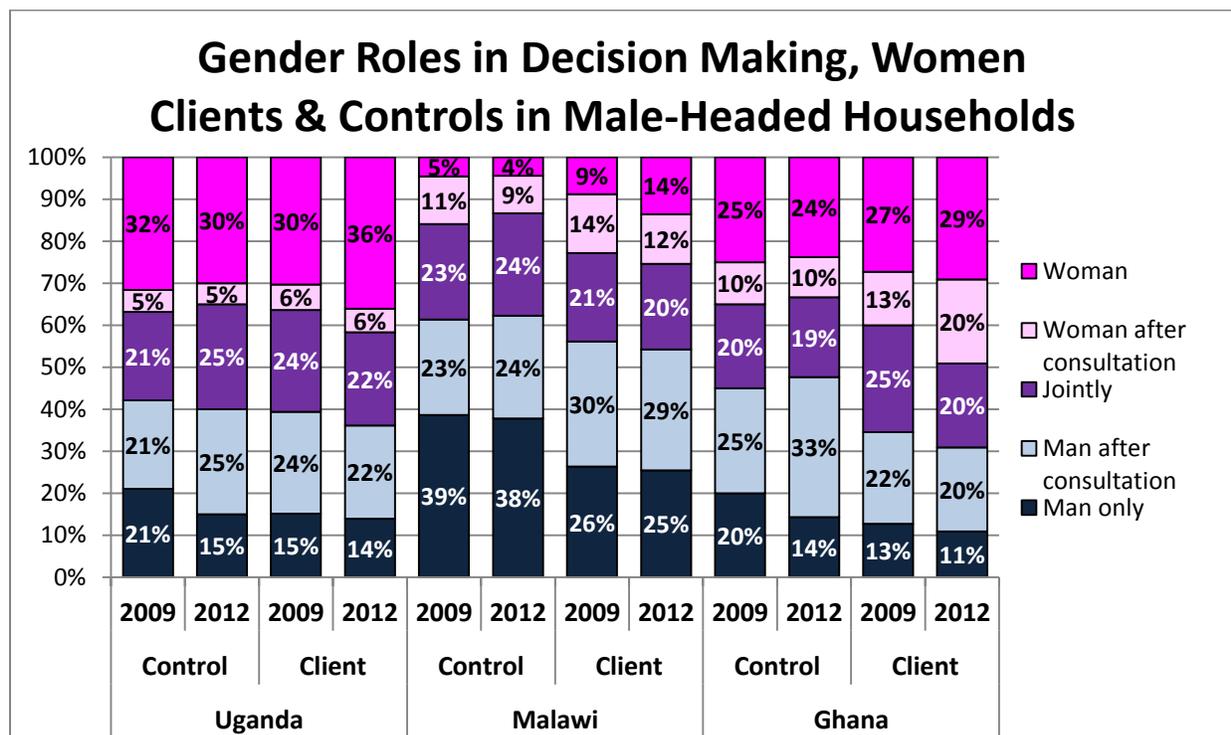


Figure 30. Gender Roles in Decision Making for Controls in Male-headed Households by Sex of Respondent



Generally, there is a clear trend of increasing empowerment since 2009 for women borrowers in all three countries, but the same is not true for women from control households where their level of decision-making control declined in both Malawi and Ghana.

Figure 31. Gender Roles in Decision Making, Women Clients and Controls in Male-headed Households



Status of Female-headed Households

Looking briefly at some of the indicators measured in the survey, it is possible to delve more into the status of the female-headed households. With the PPI, for example, in 2009 female-headed households averaged several points lower than male-headed households for both clients and controls. Even though they increased by more in the four-year interim, their scores in 2012 were still marginally lower than their male counterparts, although the gap had narrowed. Interestingly, female borrowers from male-headed households scored highest on average.

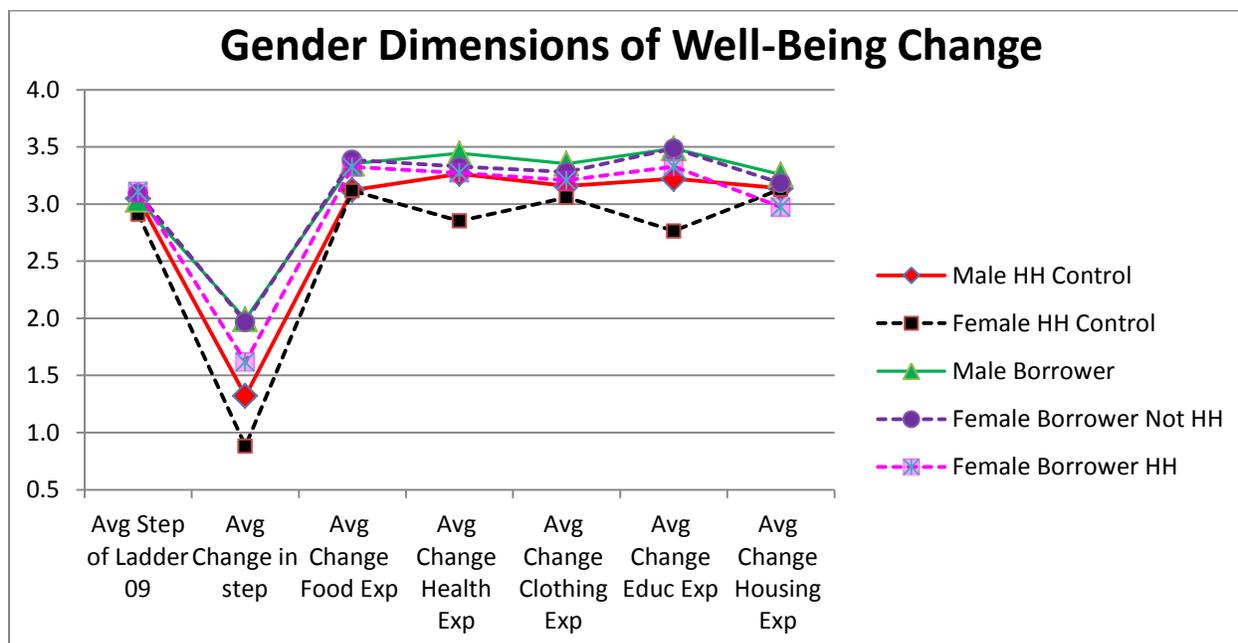
		n=	Average PPI 2009	Average PPI 2012	Average Change In PPI 2009-2012
Control	Male HH	347	49.19	49.71	0.51
	Female HH	35	46.54	48.77	2.23
Male borrower	Male HH	640	48.51	50.43	1.91
Female borrower	Male HH	151	50.14	51.21	1.07
	Female HH	77	48.81	50.79	1.99
All control		382	48.93	49.60	0.67
All Client		868	48.83	50.60	1.77

A look at the other indicators shows a similar pattern. The female-headed control household falls at the bottom of the scale, and the male control is just slightly higher than that. The male borrower has the highest score with the female borrower from a male-headed household following very closely below.

The female borrower who is the head of household does better in general than the male control, but less well than either male or female borrowers from male-headed households.

Table 23. Well-being Indicators by Borrower Status and Sex of Head of Household	Male HH Control	Female HH Control	Male Borrower	Female Borrower Not HH	Female Borrower HH
Average Step of Ladder ²⁶ 2009	3.0	2.9	3.0	3.1	3.1
Average Change ²⁷ in Step	1.3	0.9	2.0	2.0	1.6
Average Change In Ability to Meet Expenses²⁸					
Food Expenses	3.1	3.1	3.4	3.4	3.3
Health Expenses	3.3	2.9	3.4	3.3	3.3
Clothing Expenses	3.2	3.1	3.4	3.3	3.2
Education Expenses	3.2	2.8	3.5	3.5	3.3
Housing Expenses	3.1	3.1	3.3	3.2	3.0
n=	348	35	644	151	77

Figure 32. Gender Dimensions of Well-Being Change



A similar story is illustrated in the graph below. With respect to food security, we see that in 2012 female-headed households were still most likely to be categorized as severely food insecure. This is true

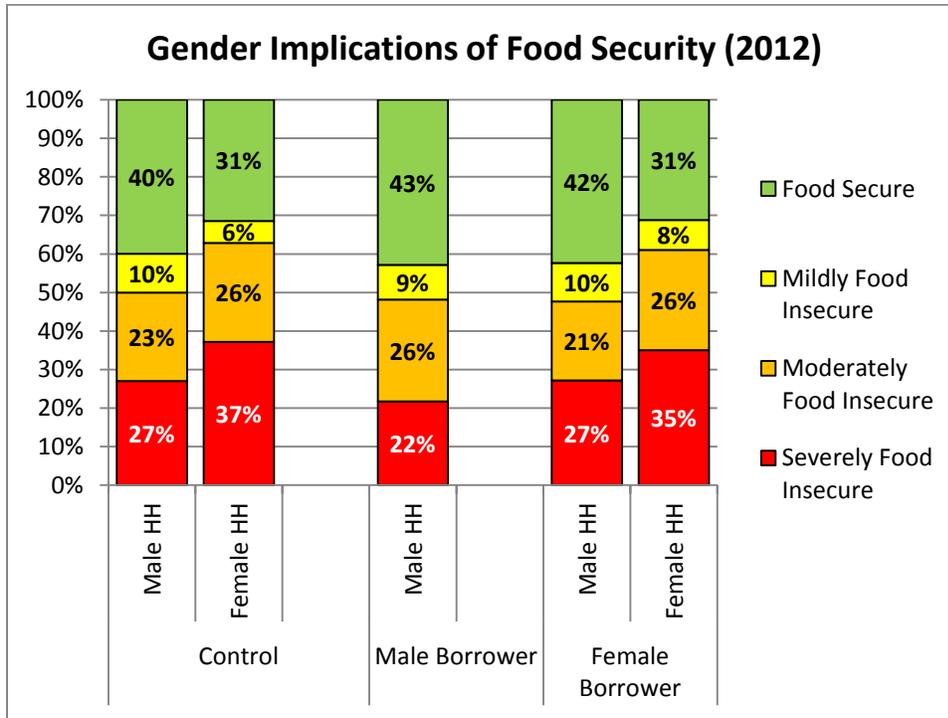
²⁶ The ladder has ten steps. The lowest step (1) represents the poorest in the community while the top step (10) represents the richest in the community. Respondents ranked their perceived household standing on the ladder in 2009.

²⁷ The Change in Step is the average number of steps up (+) or down (-) on the ladder the respondents thought their household had moved between 2009 and 2012.

²⁸ The indicators are ranked on a range from 1 to 5; 1=Much worse, 2=Worse, 3=Same, 4=Better and 5=Much Better.

when comparing among the clients or among the controls. Although, on the whole, clients performed better than controls, when it comes to female-headed households the difference is minimal.

Figure 33. Gender Implications of Food Security

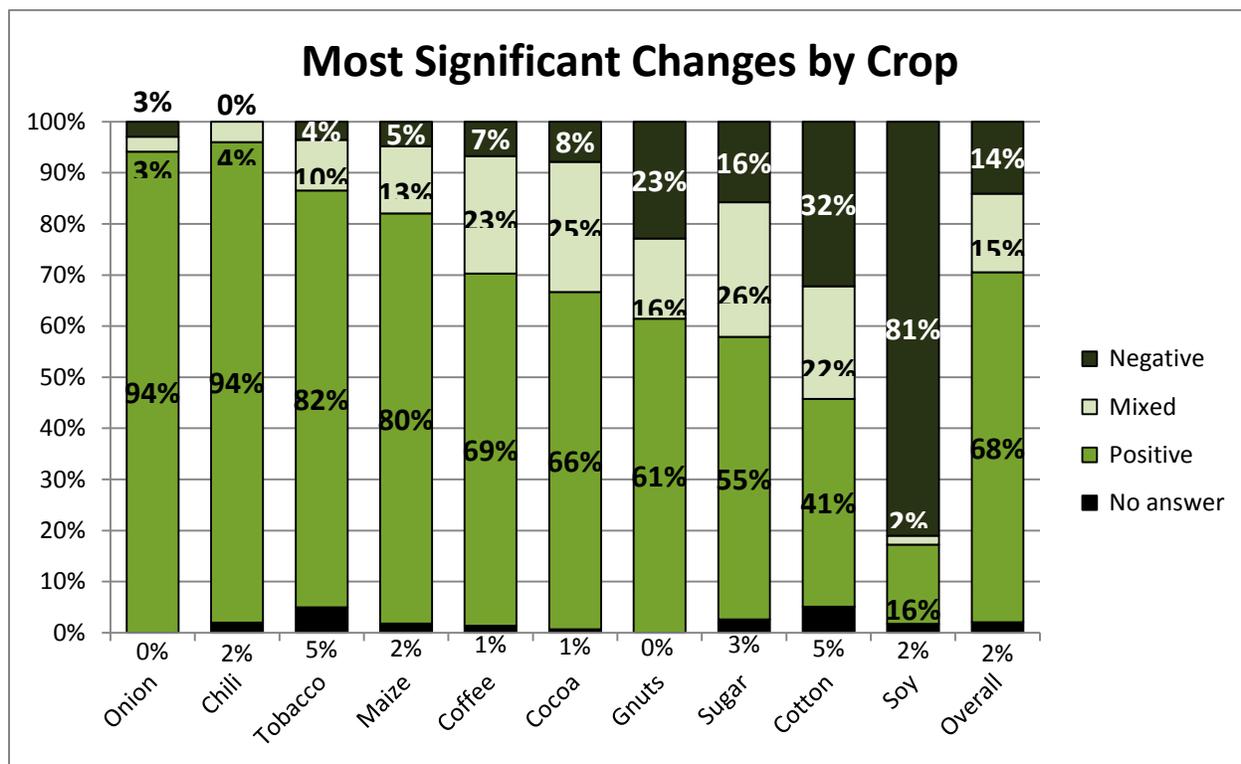


2.5. Most Significant Changes

Over 68% of client households reported only positive impacts resulting from the agricultural loan. The most commonly cited benefits included improved yield, ability to meet educational expenses, and better standard of living. If this were weighted according to the importance of the various crops in the portfolio, it might actually be much higher.

One open-ended question was included in the survey instrument asking clients to relate the most significant change that had resulted from their agricultural loan experience. They were specifically told that they could relate either positive or negative changes. The resulting responses were subjected to content analysis.

Figure 34. Most Significant Change Analysis



While experiences differed greatly by crop as illustrated above, overall, 68% of the clients reported only positive impacts. The most commonly cited benefits included improved yield, ability to meet educational expenses, and better standard of living.

Fourteen percent of the respondents reported only negative impacts. They complained of loan repayment difficulties, weather related yield loss, and forced sale of assets to repay the loan. These were dominated by soy producers from Malawi and cotton growers from Uganda. This is to be expected given that many of the soy farmers had defaulted after a bad production year caused by late delivery of seed and water stress due to late planting. Similarly, in the first year of the agricultural loan program in Uganda, cotton farmers were badly hit by a collapse in the market price.²⁹ This combined with bad

²⁹ Based on the indicative price released at the time of planting, farmers were expecting to be paid 2,500/= per kg but only received 1,000/= due to a collapse on the international market.

weather resulted in most of them taking a loss on the crop that year. While almost all of them actually repaid the loan, many had to sell assets in order to do so.

A total of 15% of clients had mixed comments to offer, including both compliments on the impact of the loan on yields, access to inputs, and children's education but at the same time complaining about problems of weather (especially for cocoa in 2012), short loan repayment period, and the delayed release of funds or inputs from the loan (soy and cocoa especially). This highlights the fact that the most recent experience strongly influences the client's perceptions. For both cocoa and maize in Ghana, 2012 was a relatively poor production year due to bad weather. Those farmers, who were on their second or third cycle, remembered that the previous year they got bumper harvests as a result of the increased fertilizer use, so they are still keen to continue with the program in the future, but the most recent difficulties in paying the loan when the season was bad color their perceptions.

The detailed breakdown of impacts identified by households that reported positive changes resulting from the loan is as follows. Note that the percent refers to the share of the 68% of households reporting positive impacts, not to the total sample of respondents.

Table 24. Positive Impacts (n= 597)				
Changes mentioned	Uganda (n= 171)	Malawi (n= 175)	Ghana (n= 251)	Overall
Yield Increases	40%	29%	47%	40%
Better access to Education	50%	21%	26%	31%
Improved Standard of living	25%	17%	32%	25%
Access to inputs	18%	18%	16%	17%
Higher Income	26%	17%	4%	14%
Increased Investment/ Business	25%	4%	14%	14%
Purchase of Productive Assets	20%	17%	12%	14%
Better Financial management	13%	11%	12%	12%
More land in Production	20%	3%	11%	11%
Improved Housing	5%	4%	17%	10%
Extension advice / better farming methods	5%	11%	6%	7%
Hired labor	9%	3%	0%	4%
Stronger group	2%	6%	0%	3%
Better Market Access/Prices	1%	3%	1%	1%

Similarly, for households that reported mixed results, including both positive and negative results of the loan, the detailed breakdown of the impacts cited is summarized below. The positive results are summarized on the left, while the negative results are presented on the right. The proportion of households giving each is shown with the most common listed first.

Table 25. Mixed Impact (n= 134)									
Positive Results	Uganda (n= 54)	Malawi (n= 28)	Ghana (n= 52)	Overall	Negative Results	Uganda (n= 54)	Malawi (n= 28)	Ghana (n= 52)	Overall
Yield	26%	32%	48%	36%	Weather disaster	17%	7%	73%	37%
Access to inputs	15%	29%	42%	28%	Short loan period	30%	36%	4%	21%
Education	22%	11%	8%	14%	Better yield 2011	13%	14%	29%	19%
Productive Assets	24%	4%	6%	13%	Late funds/ inputs	13%	4%	29%	17%
Standard of living	20%	4%	8%	12%	High interest rate	17%	11%	0%	9%
Income	17%	7%	4%	10%	Inputs not enough for land available	4%	7%	12%	7%
More land	19%	0%	4%	9%	Sale of assets to pay	19%	0%	0%	7%
Investment/ Business	9%	4%	10%	8%	Marketing problems	19%	0%	0%	7%
Extension advice / better farming	7%	11%	2%	6%	Loan payment problems	7%	18%	0%	7%
Hired labor	13%	0%	0%	5%	Personal loss /bad investment	13%	0%	0%	5%
Financial management	7%	4%	4%	5%	Low prices	4%	11%	0%	4%
Housing	6%	0%	6%	4%	Lost money covering group default	6%	4%	0%	3%
Stronger group	0%	14%	0%	3%	Loan not disbursed in one payment	2%	0%	0%	1%

The detailed breakdown of impacts identified by households that reported negative changes resulting from the loan is as follows. Note that the percentages refer to the share of the 14% of households with negative results, not to the share of the total sample of respondents.

Table 26. Negative Impacts (n=123)				
Changes mentioned	Uganda (n= 37)	Malawi (n= 71)	Ghana (n= 15)	Overall (n= 123)
Loan payment problems	24%	41%	13%	33%
Weather disaster	32%	10%	67%	24%
Sale of assets to pay	54%	7%	0%	20%
Late funds/ inputs	5%	18%	27%	15%
Lost money covering group default	14%	15%	0%	13%
Personal loss /bad invest	14%	6%	0%	7%
Low prices	19%	0%	0%	6%
Marketing problems	11%	4%	0%	6%
Inputs not enough for land	3%	3%	13%	4%
High interest rate	0%	7%	0%	4%
Short loan period	5%	1%	0%	2%
Loan not disbursed in one payment	0%	3%	0%	2%

3. Factors for Success

The study clearly shows that the Rural Model as envisaged in the original proposal to MasterCard is indeed critical to the success of agricultural financing; but that certain aspects of the partnership may be outside the direct control of Opportunity Bank. Based on the information gathered during the value chain analysis, survey, focus groups and key informant interviews, the following factors have been identified as key determinants of success for the participants in the agricultural finance program.

- Enterprise selection
- Group selection/farmer characteristics
- Intervention design
- Financial literacy
- Loan disbursement/ input linkages
- Technical advisory services
- Market linkages
- Monitoring
- Managing Repayment

The interlocking roles of farmers, key value chain partners (input suppliers, extension service providers and market off-takers), and the MFI in each are discussed below. No single commodity or partnership is going to have a perfect combination of all of these factors. Many variations and permutations are possible, but each contributes to the final impact that results.

3.1. Enterprise Selection

African farmers are highly diversified, producing a wide variety of crops, often simultaneously, perhaps even on the same field. Not every commodity grown by African farmers is a good candidate for agricultural finance. Enterprise selection is the first step in the development of an agricultural lending intervention.

Role of the Farmer

One key factor in enterprise selection is the importance of the crop to the local agricultural economy and the level of existing farmer knowledge and commitment to growing the crop. Certain crops have been grown traditionally, and will continue to be a major focus for farmers because they have a proven market and are known to do well in a certain location. Examples of this include the traditional cash crops – tobacco (Malawi), cocoa (Ghana), and coffee (Uganda). Perennial crops like coffee, cocoa, and sugar require a long-term commitment because they take long to come into full production. The local conditions in terms of availability of land and labor will set the limits on potential for expansion of production, as will the potential tradeoffs between commercial production and food self-sufficiency. Lastly, the returns to land and labor for a given crop shape the attractiveness of the enterprise to farmers. Farmers will shift out of production of even the most traditional crop if it is no longer profitable because the prices have become consistently less favorable, or productivity has fallen because of changing soil conditions or weather patterns. This is increasingly the case in Malawi where tobacco farmers are shifting into soybeans and groundnuts because prices have been low.

Role of the Value Chain Partner

The availability of strong committed partners with a vested interest in improving production of the crop is critical. This may be a well established farmer's association (like for coffee in Uganda), a donor funded NGO (Concern Universal for maize in Ghana or Technoserve for Cocoa in Ghana), a government agency (the Ghana cocoa board [Cocobod], Uganda Coffee Development Authority in Uganda), or a private sector stakeholder in need of a supply chain to fulfill its market demand (Sugar Allied Industries Ltd in Uganda, Allied Tobacco in Malawi). But in each case, the level of market potential and profitability of the crop is key. The over-riding consensus of development practitioners is increasingly that supply-led development doesn't work. The failure to consider demand factors has been a major problem with past efforts at agricultural development. Farmers need to expand production of those things that the market needs, rather than simply increasing production of what they know how to produce and then trying to develop a market for it afterwards. Location, cost of production and access to opportunities for value addition will all play a role in determining the comparative advantage of a given location in producing that commodity. This has been the rationale behind all of the crops that Opportunity Bank is offering agricultural finance for.

Role of the MFI

Market potential and profitability alone are not a reason for investing in the provision of agricultural finance. They are necessary but not sufficient. In addition, there must be a potential technical alternative that can increase production or profitability, and a financial constraint to the adoption or expansion of that technical intervention that can be ameliorated with loan financing. Opportunity has succeeded because it selected enterprises where there was a potential to build strategic alliances with strong partners that had technical solutions to offer in response to existing production constraints. The challenge then is to understand and leverage partner interests to provide poor clients with profitable investment opportunities.

3.2. Group Selection/Farmer Characteristics

Once the commodity or enterprise has been identified, the question of farmer group selection comes into play.

Role of the Farmer

The level of pre-existing farmer organization for this crop greatly affects success. Agricultural financing is easier where farmers are already organized into functioning groups with a high level of cohesion and trust. Formation of new farmer groups, takes a great deal of time and effort. The group lending approach is fundamental to Opportunity's success in extended agricultural finance to smaller producers, but for this to succeed, it is critical that the farmers be empowered to exercise a real say in who becomes a member of the group. Unless the group has the ability to exclude people who are not trustworthy from participation, their willingness to demand accountability from their members will be greatly compromised. Where groups lack cohesion and defaults impose costs on the rest of the group members, farmers get discouraged and disband after just the first loan cycle. This has been a problem with some of the cocoa groups in Ghana, and the soy groups in Malawi.

Factors of commonality are often important in group formation. Language, culture, family and religious ties can all be of significance. The high level of group cohesion among horticulture producers in Ghana constitutes an important factor in their high repayment rates.

Generally the poorest and most marginal members of the community will not be included as early adopters because they lack the resources to be able to take a risk. This can be seen from the results of the PPI analysis that shows that most client farmers are not from the poorest quartile.

Role of the Value Chain Partner

The level of prior investment in group mobilization and the duration, frequency and consistency of contact with the group will greatly determine the contribution of the value chain partner to the successful implementation of the loan program. Partners that offer only one-off training services, or spot market sales of inputs or purchases of product, make a limited contribution to group performance. This was a problem for soybeans in Malawi and maize in Uganda.

Role of the MFI

Flexibility is important when setting the criteria for group selection. Rigidity in setting the criteria for groups can be counter-productive. For example, insisting on a specific number of members in the group can lead groups to take inappropriate actions to either include people who are really not known or trusted, or exclude potentially valuable members because the number is fixed. When the group does not feel empowered to select its own members, then its commitment to enforcing agreements becomes seriously compromised. An example of this was found in Uganda, where rigidly enforced criteria on group size, led groups to add members hastily in order to qualify for participation. When these members who were added at the last minute later defaulted, the groups blamed the bank for their resulting losses – saying they had been forced to accept people they didn't know. (This issue can apply to criteria set by value chain partners as well.)

From the perspective of the bank, the distance from the nearest bank branch, availability of transport, and density of potential clients in a given area all greatly affect the cost of financial service provision. In Uganda for example, we heard that many potential coffee clients were excluded from consideration because they lived outside the 25km radius for service provision set by the local branch. A phased approach has been the most common model for successful expansion—developing and testing relationships initially in the easier to access communities, and then investing in service delivery through establishment of financial access points once the viability of the intervention has been verified. The transient and time bound nature of NGO projects is a challenge in this respect, because continuity of technical assistance is not guaranteed. NGOs can act as an important entry point, however, given the presence of established private sector market players who can offer continuity of supply and demand after the project takes off. For example, it remains to be seen whether the private sector off-takers will be able to keep the maize groups in Ghana going once the Concern Universal project support ends.

Branch decisions to grow slowly in line with capacity to implement and proved demand for the commodity have also been important. A prime example of this is the gradual growth of the horticulture (onion and chili) portfolio in Ashaiman, Ghana.

3.3. Loan Product Design

The loan packages offered by Opportunity Bank vary from location to location as described earlier. The best approach depends on a number of location and crop specific factors.

Role of the Farmer

Identification of the most critical constraint is central to the design of the intervention. It is important to involve farmers in identification of these critical constraints, to ensure that the loan package addresses a real need. In most cases it is assumed that access to inputs is the most critical constraint, but that is not always the case. Cash for tractor hire, hiring of agricultural labor and to meet cash flow constraints at the time of marketing have also been identified depending on the nature of the production arrangements. What is critical is that the additional investments have a real potential to make a difference in the level of production or the profitability of the market that can be captured. Inputs given in kind are less easily diverted to other uses, but inputs alone may not achieve the desired objective if cash constraints at a later stage of production (for example weeding) negatively affect productivity.

Role of the Value Chain Partner

The design of the relationship, and the most appropriate financial package is greatly affected by the roles and rational/motivation for the intervention on the part of the key value chain actor. In Malawi, the wholesaler's interest in accessing groundnuts, led to design of a loan product where repayment was made in kind in the form of produce.

The potential for conflict of interest must be recognized as well. For example, some Cooperatives in Uganda who were providing extension support and market outlets to coffee producers, opted not to participate in the loan program because they had a vested interest in steering their members to borrow money from their own in-house savings and credit cooperative (SACCO), even though the cost of finance was higher. Interestingly, it was the leaders in the cooperative who were benefitting from the Opportunity loans, while advising their members to borrow from the SACCO.

Role of the MFI

Opportunity has been very innovative and successful in designing agricultural financing products that peg disbursement and repayment of the loan to production and marketing cycles. The loan repayment period covered the entire production cycle and an extra period, usually one to two months, was given for selling the produce in order to fully pay up the loan. Getting the timing right is very important. The packages have differed from commodity to commodity in terms of the form in which loans are given - including a mixture of physical inputs and cash. (For details of the loan packages for each commodity see the tables in Annex 4.)

The other appropriate complimentary financial services, such as targeted savings packages, mobile money services, individual financing for key value chain actors (input dealers, traders and processors), and lending for equipment purchase (tractors, lorries) offered by Opportunity have all contributed to the success of the selected value chains.

There are instances where the limitation in the size of the loan package is seriously constraining the potential impact of the intervention. For example, in Ghana the current loan packages limit the size of

the loan to 3 acres (maize) or 4 acres (cocoa) even in the third and fourth loan cycle. While this is more than adequate for some farmers, data from earlier pilot mapping exercises indicates that about 46% of the current cocoa farmers might qualify for larger loans – possibly up to double the size of the current 4 acre limit set on cycle 3 loans. The inputs limitation means that farmers are using far less fertilizer than they should be, and so productivity is constrained. For several years, Opportunity has been talking about developing a system for mapping and profiling farmers to verify their capacity to handle and productively absorb larger loans. The non-availability of low cost, and efficient technology to accomplish the task has been a constraint. Currently, two alternative approaches are being tested. One uses a hand-held computer tablet with an inbuilt GPS. The other uses mobile phones with GPS software in collaboration with Grameen AppLabs Community Knowledge Worker-based system.³⁰ The smart phones also include data capture technology that can record socioeconomic information collected during the application process. Both approaches have faced some challenges, but there is unanimous agreement on the importance of finding a cost effective solution so that loan sizes can be increased for qualifying clients.

3.4. Financial Literacy

Improved financial literacy is one benefit that was widely appreciated by interviewed clients. (83.76% of clients had received financial literacy training from Opportunity Bank.)

Role of the Farmer

The past history of financial management training and exposure of groups to savings mobilization interventions was cited as contributing positively to group seriousness and commitment, and to the group's ability to manage and repay loans on time. Previous village savings and loan experience was noted to be especially helpful because it built the groups confidence in the financial management of their leaders. Many of the maize groups in Uganda were originally formed for VSLA.³¹

Role of the Value Chain Partner

Value chain partners play an important part in the financial management skills of groups and individual borrowers. The level of transparency in communication - regarding the terms and conditions of the loan, the prices of inputs supplied and the prices paid for produce sold - is critical in building trust between the clients and the private sector partners. Failure to communicate clearly on these matters, as noted for example with the case of the groundnut wholesaler in Malawi, can result in high levels of mistrust and dissatisfaction on the part of clients.

³⁰ The Community Knowledge Worker is usually a "lead" farmer in a community who delivers agricultural knowledge to farmers by using a database of information on the phone and a farmer hotline.

³¹ VSLA (village savings and loan association) is an approach developed by CARE International and promoted widely around Africa. It involves mobilizing savings from within the group that is then lent to other members for small-scale income generating activities and social emergencies. Borrowers often pay interest rates of up to 10% per month on these loans. The revenues generated go to the group.

Role of the MFI

The services offered by Opportunity in providing training in financial literacy have already been noted. Interviewed clients stressed the importance of regular loan statements, and passbooks for savings accounts, to assure borrowers that their money is safe and that the loan payments have been correctly credited. Such transparency builds confidence. The recently filmed videos in all three countries have been translated into local languages. These have been identified as an innovative and entertaining way to educate borrowers. Its use in training sessions in Ghana was more appreciated than just running it in the bank lobby, because members would take the time to comprehend the full message.

3.5. Loan Disbursement/ Input Linkages

The previous chapter on changes in production clearly highlighted the extreme importance of timely disbursement of loans/inputs and the linkage to quality suppliers. Late planting can result in severe reductions in productivity, while inadequate input quantities, especially seed, can lead farmers to waste time and effort preparing fields that never get planted. Soy and groundnut producers in Malawi are prime examples.

Role of the Farmer

In order for loans to be available on time, the farmers themselves bear primary responsibility for getting their application submitted early and submitting the required security deposit. Late payment of deposits, and delayed repayment of the previous loan cycle by clients is a major problem contributing to late release of inputs. This was especially noted in Ghana where the time gap between the minor season cocoa harvest and the onset of fertilizer application for the coming year is relatively short. In theory, the farmers are supposed to complete repayment after the first harvest, so there is plenty of time to prepare for the coming season, but in years like 2012, when the first season is negatively affected by bad weather, many farmers only complete payment after the minor harvest. Failure to repay by a single individual can hold up the loan disbursement for the entire group.

Role of the Value Chain Partner

There have been examples, however, of inputs distribution being unduly delayed by the value chain partner, whether as a result of inefficiency or of technical problems in the availability of inputs. Adequate prior planning and procurement, and transparency in communication are essential to minimize the negative implications of such delays.

Quality assurance for inputs supplied is also critical, although the number of complaints regarding substandard inputs was surprisingly minimal.

Role of the MFI

While both the farmers and the input suppliers bear primary responsibility in assuring the timeliness of loan disbursements, the Bank must also continue to ensure efficiency of the application and approval process. Computerization of the profiling and application data into the bank's main management information system should help to speed the process.

There are particular challenges when the bank has to deal with distorted input markets—the case of government fertilizer subsidies for cocoa in Ghana being a prime example. Supplies of government subsidized fertilizer are inevitably released late, and even the announcement of the fertilizer price for the coming year is often delayed, creating opportunities for price manipulation by the licensed input dealers. The new prices are not announced until May, but cocoa farmers have to apply for their loans and start depositing money into the group reserve account already at the end of the year. In 2013, the fertilizer subsidy was greatly reduced so prices jumped significantly. In order to still get fertilizer to farmers on time, it was necessary for the bank to make a special provision to adjust the value of the loans upward and to release loans even though the farmers had not increased their deposits to cover the new higher loan amount. Opportunity may need to consider stocking fertilizer in advance of the season in order to lock down prices and ensure timely delivery to farmers. Otherwise, the entire cocoa credit program could be jeopardized. This matter needs thorough investigation.

3.6. Technical Advisory Services

The introduction of improved production practices requires both access to timely improved inputs, and technical advisory services to optimize their use. The traditional dilemma of agricultural development projects was the limited impact of training without access to inputs. But the reverse is also a problem. Either one without the other has substantially less impact.

Role of the Farmer

For crops that farmers have grown all their lives, there is sometimes a tendency to assume that they only need inputs and to undervalue training. Farmer willingness to attend training and adopt improved production practices is therefore a pre-requisite for success.

Role of the Value Chain Partner

The provision of practical training and on the spot technical advice and problem solving is an important role of the value chain partners. Generally speaking, the farmers interviewed valued the extension training provided and cited adoption of new skills as an important reason for increased production. Examples include better nursery management (vegetables in Ghana and tobacco in Malawi), soil fertility management (all crops in Ghana, coffee and maize in Uganda as well as tobacco in Malawi), improved post harvest handling and marketing (maize in Ghana and tobacco in Malawi). Farm visits for on the spot advice by field officers of the ESPs (maize and cocoa), government extension (maize), and Opportunity agricultural officers (onions and chilies) were also greatly appreciated.

Concern with the theoretical classroom nature of some of the training, and the absence of practical demonstrations was, however, noted in many locations. The distance that farmers have to travel to attend training or visit demonstrations was also mentioned as a constraint. Not all of the value chain partners provide training. Some simply deliver the inputs and assume the farmers know how to use them. The results generally show the deficiency of this approach. The lack of training proved a serious drawback for soybeans in Malawi.

Role of the MFI

In light of the absence of strong extension partners in some locations Opportunity is exploring a number of creative alternatives. In some cases, the Opportunity loan officers end up playing an important support role in the provision of agricultural extension advice (as observed with chili farmers in Ghana). In the case of cocoa in Ghana, Opportunity has experimented with an innovative option of including contracted private extension support paid for by the farmers themselves (Entrepidpro). Opportunity is also exploring the adoption of the Community Knowledge Worker approach, which uses trained community members to provide extension advice from an online database accessed using smart phones.³²

3.7. Market Linkages

One of the biggest constraints African farmers face is the small scale of their production and the high transactions costs involved in getting their produce to market. Markets are generally thin, demand and prices can fluctuate wildly leading to a bust and boom cycle in production. One of the most important contributions agricultural finance can offer is its link to contract farming or better-organized relations with established markets.

Role of the Farmer

It is very difficult for large buyers and processors to deal with individual, small-scale farmers. Isolated farmers are almost always served by itinerant middlemen who carry out the tasks of bulking and transportation, but at a considerable cost. Such traders have also traditionally provided short-term financing to help farmers meet emergency cash needs, by pre-financing future procurement – but again at a high cost to the farmer who receives a much lower price than on the open market.

Farmers can play an important role in market development by organizing themselves for collective action, but this has rarely been accomplished without outside assistance (either NGOs or private sector supported) or government byelaws in favor of cooperatives linked to marketing boards.

When farmers are linked with better markets through value chain actors collaborating with the agricultural finance program, they still play an important role in sharing market information, managing the collection centers, and monitoring each other to ensure against side selling and diversion of produce to reduce the exploitation by money lenders.

Role of the Value Chain Partner

Linkage to an assured private sector market for the produce is a necessary condition for successful implementation of the agricultural finance program; and in this, the value chain actors play a critical role. This may be through contracted production for the specified company (tobacco in Malawi, sugar and cotton in Uganda), market information and links to competing off-takers (maize in Ghana), direct collective marketing through a cooperative to high value fair trade exporters (coffee in Uganda), or building trusted business linkages with individual traders (horticulture in Ghana). Ultimately the success

³² This approach was developed by the Grameen Bank's Applab project in Uganda.

of the relationship depends on the level of trust and transparency in the relationship and the market price trends resulting from supply and demand dynamics.

NGOs like Concern Universal (maize in Ghana) can play an important role as a trusted arbitrator, promoting independent links to market information, and supporting the existence of collection centers where farmers can store their produce, verify weights and produce quality, offer post harvest handling services such as shelling, and promote competition between trusted off-takers.

Role of the MFI

The loan itself is an important contribution to improved marketing. By relieving cash flow constraints and not demanding repayment until a couple of months after harvest, Opportunity effectively gives farmers some breathing room to be able to negotiate better with buyers. Farmers can now wait for the better price rather than being forced to sell for low prices at harvest (or even before).

Coffee farmers in Uganda noted that because of the loan, they can wait until the coffee is ready and harvested—and get a better price. Members no longer sell fresh coffee cherries but rather wait to dry the crop so as to get better prices—thereby getting increased revenue which enables them to repay the loan and get profits. The proportion of farmers selling coffee to money-lenders while it is still on the tree is also reducing significantly.

Opportunity's partnerships with value chain partners linked to higher value markets who repay the loans directly from the sale of produce is appreciated.

3.8. Monitoring

Role of the Farmer

Given that the Opportunity loans are disbursed using a group methodology, the most successful groups are those that closely monitor members to ensure that inputs are properly applied, good agricultural practices are followed and there is no diversion of resources that might jeopardize timely repayment.

It is recognized that early reporting of problems with respect to input quality, disease or weather related production problems, and marketing challenges is also the responsibility of the groups.

Role of the Value Chain Partner

Value chain partners also have a responsibility to monitor production, in order to prepare for collection and processing, and to curtail side-selling. Those that work through local buying agents need to also monitor to ensure that their agents are following fair business practices in dealing with the farmers – including fair weights and measures, transparent prices and timely payment.

Input suppliers that want to stay in business for the long term need to monitor farmer satisfaction with input quality including germination rates, disease susceptibility, and effectiveness. This is difficult for input suppliers who work with farmers on an individual level, such as in Uganda.

Role of the MFI

Similarly, Opportunity needs to maintain regular contact with the groups, and develop early warning systems to alert it of potential problems in the making. Direct contact with the clients is important. When the bank relies entirely on the private sector player, as in Malawi, there are possibilities for abuse. Even when loans have all been paid, it doesn't necessarily mean that clients are satisfied. Cotton farmers in Uganda complained bitterly about the pressure exerted by bank staff to collect on loans the year the price collapsed. Most of them only participated for that one loan cycle.

Another important role for the bank is monitoring the demand and supply trends in order to coordinate program expansion with demand and thus avoid stimulating over production that can lead to the collapse of the market. Perishables such as chilies and onions that are difficult to preserve, cannot expand indiscriminately. The cautious approach Opportunity has taken in the expansion of that loan program is appreciated by current producers.

3.9. Managing Repayment

Role of the Farmer

First and foremost, timely repayment is the responsibility of the farmer, and the group of which he/she is a member. Results of the study show that farmers that have alternative sources of income are most likely to be in a position to repay the loan even in a bad agricultural year. Gold mining and salt production were cited as being very important to borrowers in Ghana, for example. Continuous screening and monitoring by group members also helps to ensure farmer performance and prevent defaults. Maize farmers in Uganda took that responsibility very seriously, because the danger of default would hurt them badly.

The groups themselves need to be advised to engage in contingency planning and develop their plan of action for how to deal with defaulting members. The options open to them are highly location specific depending on local land tenure systems, local courts, and so on. In Ghana and Malawi, the security deposits are held in a special locked account controlled by the group. In Uganda, the security deposits are in individual savings accounts, but physical assets, like land titles, are held by the bank on behalf of the group in some cases.

Role of the Value Chain Partner

The value chain partners, especially private sector firms involved in marketing, play an important role in repayment. Timely payment for produce delivered to the buyer is one important element. When the buyer takes the goods on credit and then delays to pay either the bank or the farmers they are effectively getting free finance. This has been a problem in some instances (one off-taker for maize in Ghana for example was using this method to finance expansion of his processing).

Some value chain partners have addressed the repayment issue by taking repayment in kind at a fixed rate and then leaving farmers free to sell off the remainder on the open market (groundnuts in Malawi). Enforcement faces its challenges, however. Transparent communication about weights, prices and amounts paid to the bank are critical to building trust and long-term relationships.

Role of the MFI

The design of the Opportunity agricultural loan products, with smaller first loan cycles, timing of repayment deadlines to the marketing cycle, group guarantee of loans, and linkages to market off-takers all help to alleviate repayment problems and reduce risk. In addition, continuous screening of the group's progress by loan officers during periodic meetings helps to ensure farmer performance. In cases where the commodity in question does not have an organized market (maize in Uganda), groups were encouraged to make of monthly installment payments to reduce the risk from side selling.

The establishment of low cost points of service closer to the rural clients (mobile vans in Ghana and Kiosks in Malawi) has helped to minimize transaction costs in both application and repayment. Opportunity has greatly increased its branch network to improve service to farmers. While the development of Mobile Money as an option has not expanded as quickly as originally hoped, efforts are currently underway to develop a standalone mobile technology product that can interface across all telecommunications providers, and not be dependent on any one of them. To be successfully implemented, there will need to be an adequate network of licensed agents capable of not only accepting deposits but also advancing cash from withdrawals. To achieve this, one concept that is being floated is that local Extension Service Providers would be trained and provided with smart phones that could not only handle mobile money transactions, but could also link to the Grameen Community Knowledge Worker agricultural data base in order to provide extension advisory services to client. Such an innovation will make a significant contribution to agricultural development generally and to the loan recipients in particular. Of the countries in the Opportunity family, Uganda seems most likely to be able to implement this in the shortest time frame, especially given that mobile money is more widely known and accessed there at present.

While group guarantees serve an important function of reducing risk to the bank, as mentioned above, there is the related problem that one or two defaulters in the group can effectively hold the entire group at ransom, jeopardizing their ability to qualify for the next loan cycle, and/or delaying their access to inputs for the next season. There is a clear trade-off here that has no easy solution. Early warning systems are needed to alert the bank in the event of unavoidable external circumstances that may make payment difficult (weather or market related risks). In the absence of weather-indexed crop insurance, which is only available for tobacco farmers within 30km of a government weather station, there may still be possibilities to identify creative methods for rescheduling loans under legitimate circumstances that will not send the wrong incentive signals, and yet protect the interests of responsible group members.

3.10. Summary

The factors for success and the respective roles of the farmers, value chain partners and the MFI are summarized in the following table.

Table 27. Summary of Factors for Success

Category	Farmer Roles	Value Chain Partner Roles	MFI Roles
Enterprise Selection	<ul style="list-style-type: none"> • Level of farmer knowledge and interest • Availability of land and labor • Returns to land and labor 	<ul style="list-style-type: none"> • Availability of strong committed partners with a vested interest • Market potential and profitability 	<ul style="list-style-type: none"> • Market potential, profitability • Availability of technical alternatives to increase profitability • Building strategic alliances with strong partners • Understanding and managing partner interests
Group Selection/ Farmer Characteristics	<ul style="list-style-type: none"> • Level of mobilization • Willingness of farmers to take a risk • Commitment of farmer and continuity of enterprise • Group cohesion and trust • Ability to exclude 	<ul style="list-style-type: none"> • Level of mobilization • Investment in group formation and consistency of contact with the group • Flexibility in group selection criteria 	<ul style="list-style-type: none"> • Distance availability of transport • Group size • Access to financial services/cost of service provision • Flexibility in group selection criteria
Intervention Design	<ul style="list-style-type: none"> • What farmers need most • Involve farmers in identification of critical constraints 	<ul style="list-style-type: none"> • Roles and rational/ motivation for the intervention on the part of the ESP. • Potential conflict of interest • Form in which loans are given 	<ul style="list-style-type: none"> • Pegging repayment of loan to production and marketing cycles • Form in which loans are given • Provision of complimentary products • Growing slowing in line with capacity to implement • Increasing Loan Coverage – profiling/mapping
Financial Literacy	<ul style="list-style-type: none"> • Past history of training and savings 	<ul style="list-style-type: none"> • Transparent communication on terms and conditions 	<ul style="list-style-type: none"> • Training in financial literacy • Transparent communication • Innovations in communication
Loan Disbursement/ Input Linkages	<ul style="list-style-type: none"> • Timely registration, payment of deposits, and repayment of previous loan cycle. 	<ul style="list-style-type: none"> • Timeliness of loan disbursements • Quality assurance 	<ul style="list-style-type: none"> • Timeliness of loan disbursements • Dealing with distorted markets • Locking in input supply in advance • Problems of holding entire group ransom

Category	Farmer Roles	Value Chain Partner Roles	MFI Roles
Technical Advisory Services	<ul style="list-style-type: none"> • Willingness to adopt improved production practices • Understanding importance of training 	<ul style="list-style-type: none"> • Access to advisory services • Practical training • Location of demos and training 	<ul style="list-style-type: none"> • Identifying creative options for extension advisory services
Market Linkages	<ul style="list-style-type: none"> • Organizing for collective action • Reduced exploitation by money lenders • Management of side selling 	<ul style="list-style-type: none"> • Improved access to higher value markets • Promoting collection centers and links to offtakers • Encouraging competition • Transparency in pricing and weights • Contract farming • Market information linkages 	<ul style="list-style-type: none"> • Promoting links to higher value markets • Reduced exploitation by money lenders • Cash flow options to promote capture of higher value markets • Monitoring demand and coordinating program expansion with demand and capacity to manage
Monitoring	<ul style="list-style-type: none"> • Groups monitor members to ensure no diversion of resources • Early reporting of problems in input quality, production or markets 	<ul style="list-style-type: none"> • Monitor production to curtail side selling. • Control buying agents. • Monitor satisfaction with inputs and production levels. 	<ul style="list-style-type: none"> • Regular monitoring • Promote independent links to market information • Develop early warning systems • Not rely entirely on the ESP. Maintain adequate links to groups to know what is happening.
Managing Repayment	<ul style="list-style-type: none"> • Having alternative sources of income • Continuous screening by group to ensure farmer performance and prevent default • Strong contingency planning and development of action alternatives for the group in case a member defaults 	<ul style="list-style-type: none"> • Provide payment alternatives. • Timely disbursement to the bank and farmers • Transparent communication about how much has been paid to the bank. 	<ul style="list-style-type: none"> • Favorable package design with timing of repayment after harvest • Continuous screening to ensure farmer performances • Not hold entire group ransom • Develop creative methods for rescheduling loans under legitimate circumstances

Based on information gathered during the key informant interviews the following are the most important issues for each of the stakeholders to address to ensure continued success of the agricultural lending program.

Table 28. Key Challenges for Stakeholders to Address		
For Farmers	For Key Value Chain Partners	For Opportunity
<ul style="list-style-type: none"> • Build Group Leadership capacity 	<ul style="list-style-type: none"> • Carefully screen farmer groups 	<ul style="list-style-type: none"> • Build strategic alliances with strong partners, and monitor performance of those partners
<ul style="list-style-type: none"> • Empower themselves to carefully screen members, and have a contingency plan for default 	<ul style="list-style-type: none"> • Stay on top of recommended best production practices • Field test recommendations. 	<ul style="list-style-type: none"> • Lock in input supply in advance, especially in Ghana where government's role in fertilizer supply is a complicating factor
<ul style="list-style-type: none"> • Timely payment of security deposit and loan repayment to ensure early approval of application 	<ul style="list-style-type: none"> • Ensure timely procurement and delivery of quality inputs. 	<ul style="list-style-type: none"> • Ensure timeliness of Loan approval and disbursal
<ul style="list-style-type: none"> • Monitor member use of loans to ensure good agricultural practices. 	<ul style="list-style-type: none"> • Include practical experience and demonstrations in the training curriculum 	<ul style="list-style-type: none"> • Identify creative options for provision of cost effective extension advisory services
<ul style="list-style-type: none"> • Promote savings mobilization and better record keeping and financial management 	<ul style="list-style-type: none"> • Transparency and honesty in communication of loan terms and conditions • Promote trust in the marketing and repayment arrangements 	<ul style="list-style-type: none"> • Promote partnerships with links to higher value markets - fair trade, value addition and collective marketing arrangements
<ul style="list-style-type: none"> • Ensure proper application of the inputs. Avoid temptation to spread inputs over too large an area 	<ul style="list-style-type: none"> • GPS Mapping of fields and residence for Members 	<ul style="list-style-type: none"> • Increase Loan Coverage³³ based on a uniformly implemented system of client profiling and mapping

³³ In Ghana, the limited coverage of the cocoa and maize loans in terms of the number of acres worth of inputs supplied, especially in the first cycle, constrained the impact on production levels and consequently magnitude of livelihood outcomes in beneficiary households.

4. Conclusions

4.1. Limitations of the Study

The challenges of measuring the impact of an intervention as wide-ranging as this one are considerable. Not only has the program lent money to nearly 100,000 clients producing 50 commodities in five countries, but the highly variable nature of agricultural production, which vacillates from year to year as a result of local weather conditions, is a further complicating factor. The study faced a number of specific challenges as outlined below.

- i. No initial baseline was conducted, which is not surprising given that the bank had no way to know in advance who might be borrowing under the agricultural finance program in the future. The absence of a quantitative baseline against which current performance could be measured was therefore a challenge. In addition, borrowers come and go in the program; some leaving after a single loan, others participating for four or more cycles.
- ii. This study was designed as a retrospective study of producers of 11 commodities in three countries, making before and after comparisons, for both clients and a sample of control farmers. The obvious problem with retrospective studies is the limitations of the accuracy of recall data based on memories that may fade or get distorted over time.
- iii. This is compounded by the fact that farmers have only the vaguest ideas about the size of their land holdings and fields.
- iv. As much as possible, statistically valid random samples of clients were drawn from the existing database of loan clients. Unfortunately, a comparable sample frame for control farmers did not exist. As a result, a much more informal method of identification of control farmers who are affiliated to or identified by the implementing partners in the respective locations was used to invite participation of a group of comparable farmers who had not yet harvested a crop financed with an Opportunity agriculture loan. About 11.5% of the control clients who responded had just received their first agriculture loan from Opportunity a few months prior. Others (10.9%) had borrowed money from other sources in the preceding four years. Statistical analysis found that the client and control populations were largely comparable on wellbeing measures in 2009 before the loan. At best, this method is non-systematic, but any bias introduced by the identification process cannot be measured.
- v. Ideally, if the cumulative number and value of loans issued were known on a crop by crop basis, then it would be possible to weight the findings according to the proportion of the portfolio that they represent. This would have allowed the less positive performance of a relatively minor crop like soybeans to be seen in its proper perspective. Unfortunately, such cumulative crop by crop data was not available.
- vi. While some branches were collecting socio-economic data on clients, this information was not available in any central database, nor was it standardized across locations and clients. To respond to this, available secondary information on yields and production was collected where it was available, and groups who kept records were interviewed to collate that information. This information is indicative, but difficult to analyze in a systematic manner.

4.2. Recommendations for Future Research

The limitations of the study indicated above, tend to strongly reinforce the importance of a number of initiatives that are currently under development within Opportunity.

- i. Opportunity is currently in the process of upgrading and standardizing the management information system that will be used across all partner banks. This will greatly help with the problem of comprehensive cumulative loan information by location and crop. That will allow proper weighting of the impact data that is collected in order to reflect a valid estimate of impact for the entire intervention.
- ii. Opportunity is testing two alternative approaches to the cost efficient collection of additional standardized socio-economic data at the point of application using tablet or smart phone technology. Ensuring that this system collects area, production, yield and marketing data from the season prior to the loan, will act as an important baseline against which performance of all new customers can be measured going forward. Comparable information can then be collected at the end of each season. Data analysis plans should be drawn in advance to ensure that the information collected is adequate to measure progress on the desired indicators.
- iii. The move to also map customer fields using GPS technology connected to either the tablet or smart phone, will make an important contribution to improved accuracy of area estimates as well as verification so that larger farmers can qualify for loans that are sufficient to meet their actual input needs.

The following recommendations related to identification of a control sample can be added to those above that are already in process.

- iv. If Opportunity wants to actually measure the impact of profiling and land measurement in the future, it will be important that as that initiative is rolled out, conscious thought is given to identifying and monitoring production for a suitably designed control sample that is not included in the mapping exercise and therefore does not have access to the larger loan sizes.
- v. Similarly, if a future impact assessment is planned, adequate thought should be given to clearly defining the desired characteristics of the control population, and providing for the time and effort that will be required to identify and appropriate sample frame from which a statistically valid random sample can be drawn for comparison.

4.3. Summary of Conclusions

It is clear that Opportunity Bank has made significant progress in establishing itself as a pioneer in agricultural lending in Africa and that this program has positively impacted on thousands of small scale farmers.

The fact that 68%³⁴ of all clients surveyed reported an entirely positive experience with their agricultural loans attests to the positive impact of the program. As discussed in detail in the previous sections, this study has shown that as a result of the availability of agricultural loans farmers have:

³⁴ A total of 83% of client made positive comments, but of these 15% also raised certain constraint.

- Been exposed to extension support and training to learn good agricultural practices, and obtained vital access to agricultural inputs in order to actually increase adoption of the good agricultural practices they have been taught.
- Been able to expand production as a result of purchases or rental of land and hiring of additional agricultural labor during times of critical labor constraint.
- Been linked to more reliable and less exploitative marketing channels with greater transparency of pricing and sale of produce by weight rather than the bag.
- Been able to purchase household assets, livestock and commercial properties, and invest in non-agricultural income generating activities such as transportation, petty trade, produce buying, livestock rearing, and salt mining to spread out their cash flow and diversify their risk.
- Increased their production as well as the quantities marketed of the target crops.
- Improved their household cash flow which has made it easier for clients to educate their children, pay for health care and improve food security.
- Improved their economic standing in the community, and ability to meet basic needs.

A key aspect of Opportunity's strategy is a clear understanding that microfinance providers are just one of the key stakeholders. Coordination between all stakeholders in the rural model: farmers groups, extension service providers, input suppliers, and output markets, is essential to the success of rural lending. The majority of clients have positive impressions of Opportunity's services and the impact that the agricultural loans have had on their livelihoods.

- An assessment of the partnership arrangements for each of the 11 commodities across 9 locations highlights the importance of value chain partnerships on the ultimate impact of the loan on household well-being. This requires an in-depth understanding of the local economic environment as well as the dynamics of production and marketing between value chain actors.
- There were farmers of certain key crops that did not experience positive yield, productivity, and income changes due to a number of external and internal factors that were discussed in detail in the report (i.e. cotton in Uganda and soybeans in Malawi).
- A careful review of the factors involved in these less positive contexts highlights both the exogenous risks from factors like weather and international prices which are outside the bank's control as well as the importance of all of the value chain players (Opportunity Bank, but also strategic partners offering extension advice, input supply and market linkages) fulfilling their roles in a timely and optimal manner.

Thanks to the interventions of the agricultural credit program, in collaboration with the key value chain partners, client households were able to increase their production as well as the quantities marketed of the target crops. In most cases this was as a result of increased yields, but expansion of area under cultivation was also noted. For most crops, especially those where the loan was given specifically in the form of inputs, use of the appropriate inputs for the crop increased more for clients than for control households. Similarly, in almost all crops, average production and quantities marketed exceeded those for controls and increased significantly in 2012 compared to 2009. However, there were exceptions — these being: soybeans in Malawi, groundnuts in Malawi and coffee in Uganda. The factors contributing to the observed results are explored in depth in the report.

While the main focus of the agricultural credit program is on increasing production, the underlying purpose behind the desire to boost production is actually to increase incomes and improve the standard of living and quality of life for African rural smallholders. The study, therefore, investigated the indirect impact of the agricultural credit program on indicators such as economic standing, ability to meet basic needs, access to education and health care, food security, purchase of assets and employment creation.

In each of these respects, client households were found to be better situated than control households as a result of the improved cash flow resulting from the access to credit. Money is fungible. Access to credit not only generates more income from agriculture, but it also relieves cash flow constraints. This effectively frees up resources when they are needed at critical times to address household emergencies, meet school fee payment deadlines, or invest in small-scale income generating activities. Non-farm activities are important to smooth out family income throughout the year and create an important safety net that can mean the difference between food security and going to bed hungry.

The study has shown that these secondary impacts on household well-being are significant, with clients scoring higher than control households in the same locations on almost every indicator. The increased agricultural production generated income which improved household cash flow, making it easier for clients to educate their children, pay for health care and improve food security. This, in turn, improved their economic standing in the community, and ability to meet basic needs. Gender analysis does reveal, however, that female-headed households are relatively disadvantaged, even among clients, because of their more limited labor and resource base.

The agricultural finance program has also resulted in improved visibility for the bank. Farmers are now aware of Opportunity and talk about Opportunity Bank as the bank that gives loans with favorable maturity periods and conditions. The increased visibility has contributed to Opportunity Bank capturing market share. Increasing the exposure of rural clients to the bank has enabled it to market other products notably saving accounts, individual value chain actor lending and equipment purchase loans. In summary, the agricultural lending program has made a major contribution to the achievement of the bank's mission to transform the lives of poor people.

The study reaffirms the importance of Opportunity Bank's approach of nurturing the necessary partnerships with other key stakeholders that will benefit farmers within the structure of their particular value chain. To manage risk for both the farmers and the bank, Opportunity recognizes that the loan products and implementation arrangements need to be carefully tailored to local conditions and actively foster critical value chain partnerships ensuring access to extension support, input supply, and profitable markets. Furthermore, they need to adjust and evolve in response to changing market conditions and technical opportunities. These were found to be the keys to Opportunity Bank's continued success.

Clearly there are significant challenges in providing agricultural financing in Africa, but the overall results testify to the value of the effort. The overwhelmingly positive assessment of the loan program by surveyed clients attests to both the desperate need of smallholder farmers, and to the care and effort that Opportunity has invested in tailoring the product to local conditions and responding proactively to the difficult situation on the ground.

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6. Annexes

Annex 1. Terms of Reference for Study

Terms of Reference for a Client Impact Review, External Team Lead for the MasterCard/Gates/Opportunity

Financial Services for Rural Communities and Smallholder Farmers in Africa Project

1. Introduction

The Financial Services for Rural Communities and Smallholder Farmers in Africa project is jointly funded by the MasterCard Foundation and the Bill & Melinda Gates Foundation. The implementation of the project started in 2009 and is estimated to cost \$16 million over four years. Under the project, Opportunity International and its partner institutions are offering comprehensive financial services to rural communities and smallholder farmers in Ghana, Malawi, Mozambique, Rwanda, and Uganda. The term of the current project is due to end in September 2013.

With the project winding down this year, Opportunity International plans to implement a final learning initiative under the fourth objective of the project to “work with the Foundations to design and implement a comprehensive learning initiative.” The study, a rural household impact review spanning project areas in Uganda, Ghana, and Malawi, will identify economic and social changes that farmer households have experienced with the help of Opportunity’s agricultural finance services. The review will be completed between April 2013 and June 2013.

2. Research Objectives, Methodology, and Team

Key topics

This research seeks to measure the impact of Opportunity’s agricultural loans on the lives of farmer households. More specifically, the research is expected to produce data regarding the following topics:

1. Basic household profiles (sex and marital status of borrower, family size, family member ages, earning status of members, plots worked/land ownership, financial services used, etc.);
2. Information on how the loan was used and resulting changes in the production practices;
3. Estimated trends in farmer incomes and livelihoods;
4. Trends in crop yields, total production and quantity marketed;
5. Explanations for the perceived changes in crop yields, production and incomes;
6. Estimations of new jobs created by/for farmer clients;
7. Changes in school attendance for children;
8. Changes in usage of healthcare services;
9. Data on changes in household assets;
10. Perceived impact on household food security;
11. Farmer factors for success (appreciative inquiry); and
12. Effectiveness of household profiling and/or land mapping in increasing productivity of farms and improving Opportunity’s services in Ghana.

Methodology

Multiple methodologies will be used in this study in order to gather quantitative and qualitative information to gauge the program's impact, triangulate the data and provide meaningful findings. The approaches used will include, but will not be limited to, the following:

7. A client survey to analyze the experience, perceptions and attitudes regarding the impact and effectiveness of the intervention;
8. Gathering any quantitative data available from bank and ESP³⁵ records – including transactional and farmer tracking data – to gain insights into farm productivity and farmer income changes;
9. Key informant interviews with farmer clients, bank staff, and market stakeholders;
10. Focus group discussions with clients;
11. The use of appreciative inquiry methods to identify the characteristics of farmers who successfully repay loans as compared to those who do not.

One of the challenges facing this study is that baseline data was not collected during the course of the project. In this context, this study must seek – as much as is possible – to retroactively reconstruct a baseline using multiple approaches. The client perception survey will be the key approach used for the study, supported by key-informant interviews and other creative approaches where possible (e.g. use of loan application data, credit review data, bank transactions data or data that could be gained from ESPs if applicable).

Opportunity's internal discussions have suggested using a survey instrument for gathering data from approximately 350 respondents covering at least three major crops in the bank portfolios of each of the three countries (approximately 1050 respondents across three countries). The respondents will belong to client and control sample groups. In all three countries, the sample will be drawn from the pool of farmers growing the specified crops and using Opportunity's agricultural loans.

Survey Research Parameters

- Across the range of farmers cultivating different crops, efforts will be made to use a sample size sufficient to provide results with a 95% confidence level that is within a +/- 10% margin of error.
- The questionnaire is intended to be comprehensive enough for drawing inferences on a broad set of economic and social changes. This may result in an interview lasting up to 45 minutes.
- Both quantitative and qualitative questions will be applied, but given the challenges, attempts will be made to see what can be brought out quantitatively.
- Quantitative questions on, but not limited to, crop yields, harvest volumes and sale prices, and asset ownership will be included to infer changes about the economic well-being of farmers.
- Sex-disaggregated findings and inferences about the effects of the program on youth will be drawn where possible.
- Stratified random sampling will be applied in collecting data from a representative sample group, while clustering for efficiency.
- Control farmers will be identified from non-recipient farmers in the same vicinity as the sample of borrowers, although their availability will vary significantly between locations.

³⁵ Opportunity Banks in countries have partnered with NGO and private sector Extension Service Providers (ESP) to train farmer clients on Good Agricultural Practices (GAP).

3. Key Activities

A mixed method approach requires that the methods used match the answers needed. For example, while ascertaining changes in farmer yields and incomes may involve client surveys seeking to establish a baseline retroactively, key informant interviews, focus group discussions, and farmer tracking/transactional data may also be useful. Understanding changes in farmer households may have to rely primarily on surveys—enabling respondents to provide feedback about perceptible changes that they might have experienced in their economic and social well-being over the course of being served by the project. Key informant interviews, focus group discussions and transactional data will meanwhile enable triangulating the information and adding additional analyses. As this suggests, this project welcomes any new and alternative approaches that would aid in producing answers to the key questions.

The External Team Lead (Lead Researcher) is responsible to fulfill the following activities:

1. Review Literature and Project Scope: Review project reports, identify the scope, geographical areas, and types of Agricultural Finance services offered in Uganda, Ghana and Malawi.
2. Prepare agriculture sector value-chain briefs: A local consultant for each crop will support the Lead Researcher in preparing a brief background summary on the agricultural sector highlighting the key issues in the structure, conduct and performance of the commodity value chain in question including main constraints and opportunities in input supply, production, post-harvest handling, processing/value addition and marketing.
3. Engage survey enumerators: Train and lead a team of enumerators to complete interviews in each country. Enumeration staff will be engaged with the help of country point-persons and Opportunity's Knowledge Management team. In Uganda, the lead researcher will engage the enumerator staff. Opportunity will provide an operational expense advance for this purpose.
4. Implement field surveys and data entry: Make any final edits to the survey instrument as deemed necessary through discussion with Opportunity International-U.S./Knowledge Management (OI-US/KM). Conduct primary survey research. The logistics and locations of interviews will be determined in consultation with the banks' staff. The designated bank coordinator in each country will be responsible for making all arrangements for the interviews. Data entry staff will be provided computers to log the survey responses. Field supervisors will ensure that the right respondents are interviewed, and verify quality of data.
5. Access relevant farmer tracking and transaction data: Any records that are relevant to providing a better understanding of the farmer's productivity and cash flow conditions will be considered. Additionally, any transaction or other data will be used for analyzing usage trends. Inferences will be drawn to triangulate information gathered through the survey and add other findings.
6. Interview project staff, sampling and coordination: Interview Opportunity's AgFinance Manager/Officers in each of the three countries to seek the staff's perspectives on performance, obtain farmer lists for sampling, identify control groups, and get help with survey testing, enumerator training and logistics.
7. Conduct Key Informant Interviews: Interview market agents, clients, project staff and other stakeholders using an appreciative inquiry approach. The scope of interviews will be guided by the overall scope of the study as outlined in the Purpose and Objectives section.
8. Produce early notes from research in each country: Within 6 working days following the last day of field research, deliver notes for each country (transcribed in a word documents) from the field surveys, key informant interviews, case studies and focus group discussions. The notes need not be perfectly formatted, but should document the minutes of interviews, and to a reasonable degree, the results.

9. Clean, tabulate, and consolidate data; produce first draft report: All collected data will be compiled, backed-up, cleaned and tabulated. Findings will be synthesized overall, and also compared across crops, countries and genders. The Team Lead will produce the report, per an agreed outline and submit the first draft of the report to OI-US/KM.
10. Incorporating Comments: OI-US/KM will compile comments and suggestions from key stakeholders following the draft. The team leader must produce a response document that reviews/responds to each suggestion. The team leader need not incorporate all suggestions in the report, but must consider such suggestions in finalizing the Report.
11. Final presentation: The Consultant will make a presentation on the findings of the study as organized by OI-US/KM, at which stage the assignment will be completed. Opportunity-US will schedule the presentation within 2 weeks of the final report being submitted.

4. Expected Outputs

1. Prior to research in the first country, the researchers will produce—
 - a. A filled in Data Source Matrix that lists the key questions, the answers that need to be found, and where, and through what method, such data is to be found.
 - b. A set of preliminary interview protocols for use for a variety of research questions in any key informant interviews on project questions.
 - c. A set of preliminary focus group discussion protocols for us on any research question that may require a focus group discussion approach.
 - d. A set of questionnaires for client and control surveys, prepared in electronic format for data entry, complete with guidelines for compilation and data handling.
2. During research in the field, the researchers will produce—
 - a. The client and control sample list and the sampling methodology used for each country.
 - b. The full set of completed questionnaires, with client information and legible responses in electronic format.
 - c. Updates and communications with OI-US/KM regarding progress and challenges as jointly agreed.
3. Following research, the researchers will produce—
 - a. The completed notes taken from key informant interviews, case studies and focus group discussions in word processing format. (Within 6 working days following the last day of field research)
 - b. First draft of the study report based on an agreed outline. (See Report Production and Format below.)
 - c. A presentation to Opportunity-U.S. through a communication medium yet to be determined.
 - d. A response to the comments from stakeholders collected by OI-US/KM.
 - e. **Rural Households Impact Review Report:** A publishable, final report that will produce evidence and conclusions about the project’s impact on agricultural productivity (yields, cropped area, marketed production), incomes and households in the three countries. The report will provide direct insights into the perceptions of farmers about the usefulness and weaknesses of the financial services delivered to them by the project.

Report Production and Format

The report must be of publishable quality and must—

1. distinguish clearly between findings, conclusions (based on findings);

2. include a Table of Contents, a list of acronyms, and Executive Summary of no more than 3 pages; a section describing the project and the research; a section on the methodology employed; sections discussing findings and conclusions;
3. include Annexes: Vital source documents consulted and any other relevant materials that cannot be part of the body of the report.

The team leader is responsible for the final report. Members of the research team will be asked to provide the team leader with all notes transcribed into an electronic file (Microsoft Word) upon completion of their research in each country before the team disbands.

5. Logistics

Opportunity International will take care of travel and transport arrangements, fund in-country travel-related costs, and facilitate meetings for the team providing office and meeting space as needed. It will also help facilitate key aspects of logistical arrangements. It will provide guidance and feedback on the study, and will facilitate field and enumerator logistics including organizing interviews, the translation of the survey, and will seek to partner in the interpreting of data. The AgFinance Managers will seek to work closely with the research consultant(s) and Opportunity's research team and provide necessary support.

6. Projected Level of Effort (LOE) and Timeframe

Tasks	Workdays	Timeline for Completion
Mission Planning; Desk Review; Logistical Preparations Literature review; Informational interview calls with AgFinance Managers in three countries; Draw-up Mission plan; Identify country point-persons; draw-up logistics plans ³⁶ for all countries.	7 days (Lead)	April 17-25
Engage enumeration staff; Coordinate Survey Logistics <ul style="list-style-type: none"> - Work with country point-persons to engage enumeration staff. - In-country researchers prepare value chain briefing papers for crops and lists of Key Informant Interviews. - Work with AgFinance Manager to finalize sample sets. - Work with Bank coordinators to arrange meet-ups with clients and agree on method for sampling control group. - Deliver the list of appreciative inquiry questions (Output a). - Deliver the list of sources of data (Output b). - Deliver the tool for focus group discussions (Output c). - Work with country point persons to finalize questionnaire translation and identify field interpreters where needed. 	8 days (Lead) 8 days (External) 6 days x 2 (Local)	April 26-May 7

³⁶ The logistics plan will include details about survey and training locations, transport arrangements, travel times, communication and food arrangements and the plan for preparation of survey materials.

Tasks	Workdays	Timeline for Completion
<p>Conduct research in three countries.</p> <ul style="list-style-type: none"> - <u>Uganda (11 days [Lead], 11 days [External])</u> <ul style="list-style-type: none"> ○ Train enumerators: (May 8-9) ○ Discuss approach with Bank personnel, finalize logistics, conduct key informant interviews. Travel to field. (May 10) ○ Test Questionnaire. (May 11) - <u>Two teams research four crops simultaneously:</u> <ul style="list-style-type: none"> ○ Conduct Surveys, FGDs and KIIs³⁷ (May 13-18) ○ Travel back from the field. ○ Verify and tabulate results. Debrief. Depart for Malawi and Ghana. (May 20-21) - <u>Ghana (14 days [Lead] 14 days [Local])</u> <ul style="list-style-type: none"> ○ Team arrives in Ghana (Kumasi). (May 21) ○ Train enumerators (Kumasi). (May 22-23) ○ Discuss approach with Bank personnel, finalize logistics, conduct key informant interviews (Kumasi). (May 24) - <u>Two teams research three crops simultaneously:</u> <ul style="list-style-type: none"> ○ Travel to the field. (May 27) ○ Conduct Surveys, FGDs and KIIs³⁸ (Techiman and Kejetia). (May 27-30) ○ Profiling component survey. (May 31-June 1) ○ Travel to Accra. (June 1 or 3) ○ Conduct Surveys, FGDs and KIIs (Ashaiman). (June 3-4) ○ Verify and tabulate results. Debrief. Return to Uganda. (June 5-6) - <u>Malawi (13 days [External], 13 days [Local])</u> <ul style="list-style-type: none"> ○ Team arrives in Malawi. (May 21) ○ Train enumerators: (May 22-23) ○ Discuss approach with Bank personnel, finalize logistics, conduct key informant interviews. (May 24) - <u>Two team researches three crops simultaneously:</u> 	<p>25 days (Lead) 24 days (External) 14 days (Local Ghana) 13 days (Local Malawi)</p> <p>(Enums.) 11 x 15 (U) 14 x 15 (G) 11 x 15 (M)</p> <p>(Supervisors) 11 x 2 (U) 14 x 2 (G) 11 x 2 (M)</p> <p>(Data Entry) 10 x 3 (U) 13 x 3 (G) 10 x 3 (M)</p> <p>Total pssgrs 24 (U) 24 (G) 24 (M)</p> <p>(Drivers) 2 x 10 (U) 2 x 12 (G) 3 x 10 (M)</p>	<p>May 8 - June 6</p>

³⁷Assumes 5-6 days of interviews, FGDs and KIIs in each country. Each enumerator will complete 5 interviews per day; 15-16 enumerators will complete 300-350 interviews in five days. The field researchers will conduct the KIIs and FGDs while the enumeration is in process. Farmer clients will assemble at a pre-determined meeting point for the day where interviews will take place. This suggested arrangement is directional, and may vary based on ground realities in different countries. Opportunity Banks will be consulted for determining the best arrangement for each country.

Tasks	Workdays	Timeline for Completion
<ul style="list-style-type: none"> ○ Travel to the field. (May 25) ○ Conduct Surveys, FGDs and KIIs³⁹ (Dowa-Mponera, Kasungu, and Ntchisi) (May 27-June 1) ○ Travel back from the field. (June 1 or 3) ○ Verify and tabulate results. Debrief. Return to Uganda. (June 3-4) <p>- Field surveys end (All fieldwork done by June 6)</p>		
<p>Data consolidation and draft report writing</p> <ul style="list-style-type: none"> - Review and consolidate data - Statistical analysis - Write report - Residual inquiries with the field - Submit first draft report OI-US by June 28, 2013 	<p>15 days (Lead) 15 days (External) 2 day x 2 (Local)</p>	<p>June 7-27</p>
<p>Final Report Preparation*</p> <ul style="list-style-type: none"> - Consultant receives comments from OI-US by July 5, 2013 - Consultant creates a response sheet to comments by July 12 - Consultant makes a presentation sometime the week of July 14. - Consultant incorporates comments and submits the final report by July 19, 2013. 	<p>12 days (Lead) 6 days (External)</p>	<p>June 8-21</p>
<p>TOTAL</p>	<p>67 days (Lead) 53 days (External) 22 days (Local Ghana) 21 days (Local Malawi)</p>	

Annex 2. Data Source Matrix – MasterCard Africa Review

Table 28. Data Source Matrix

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>Preliminary issues for research</p>	<p>Strategy:</p> <p>Multiple methodologies will be used in this study in order to gather quantitative and qualitative information to gauge the program’s impact, triangulate the data and provide meaningful findings. The approaches used will include:</p> <ul style="list-style-type: none"> • A client survey to analyze the experience, perceptions and attitudes regarding the impact and effectiveness of the intervention; • Gathering any quantitative data available from bank and ESP⁴⁰ records – including transactional and farmer tracking data – to gain insights into farm productivity and farmer income changes; • Key informant interviews with bank staff, and market stakeholders; • Focus group discussions with clients; • The use of appreciative inquiry methods to identify the characteristics of farmers who successfully repay loans as compared to those who do not and to understand the most significant changes resulting from the loan program. 	<p>To prepare for research:</p> <ul style="list-style-type: none"> • Prepare the questionnaire, design sampling methodology, develop the sample frame, draw sample, inform clients to be interviewed, set up logistics, and identify method for selecting and contacting control group. • Discuss with the bank and review available bank records • Identify a list of key informants for interview. Develop interview schedules for key informants of different categories. • Develop and agree on methodology and purpose of focus groups. Prepare the schedule of indicative questions for focus groups. Agree on form of output to be collected and means of analysis. • Develop the tools of appreciative inquiry, agree on expected outputs and method of analysis.

⁴⁰ Opportunity Banks in countries have partnered with NGO and private sector Extension Service Providers (ESP) to train farmer clients on Good Agricultural Practices (GAP).

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>1. Estimated trends in farmer incomes and livelihoods</p>	<p>Strategy: <u>Quantitative.</u> The primary data for answering this question will be quantitative. Questionnaire survey of client and control households from the 3 countries will provide data for generating indices on proxy measures of income and household well-being:- housing conditions; asset ownership and ownership of productive assets which help HHs to generate wealth. Cross-tabulations with Chi Square tests will help to establish the situation in 2013 and before the program in 2009 client and control HHs. This will enable comparisons of before and after project to see if there changes; while comparisons between client and control HHs will show where the changes are mainly associated with clients or they are just general to all HHs irrespective of their participation in the project. Information on changes in ability of HHs to meet their food needs; access education and health services will also be used to determine trends in livelihoods. PPI will be computed and compared with the national statistics in the three countries</p> <p><u>Qualitative</u> Information on responses from most significant changes</p> <p><u>Data sources</u> HH impact questionnaire survey FGDs with farmers Key informant interviews</p>	<p>Data Needed:</p> <p>HH questionnaire</p> <ul style="list-style-type: none"> • Question A5⁴¹; I2, and I3 will be used for generating indices on housing conditions, physical asset ownership and productive assets • I1 will provide information on acquisition of property. Average numbers before and after program will be compared for control and client HHs. Tests whether the means are statistically different • G1 and G2, will provide information for establishing changes in contribution of the target crop in to HH incomes • H1-H5 will be used to establish changes in HH ability to meet their needs (food security, clothing, housing, education, health care, which is a proxy for income and wellbeing • H 1 and H2 will provide information for computing the averages to establish well-being levels in 2013 and 2009, as well as average changes between the years for client and control HHs • The PPI questions will help to generate an index for comparison <p>Analysis needed</p> <ul style="list-style-type: none"> • Compute PPI and compare between client and control HHs • Comparison before and after the project • Compare client and control HHs • Content analysis of the Most significant change responses from section K in the household questionnaire and key informant interviews

⁴¹ Letter number combinations (i.e. A5) refer to questions in the survey instrument.

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>2. Trends in crop yields, total production and quantity marketed;</p>	<p>Strategy: <u>Quantitative</u> Quantitative information on acreage under the crop, quantity produced and quantity marketed will be used to answer this question.</p> <p><u>Qualitative</u> Discussions with produce key informants and group members during FGDs will also provide perceptions on trends and reasons for these trends</p> <p><u>Data sources</u></p> <ul style="list-style-type: none"> • Questionnaire survey • Key informant interviews and • FGDs 	<p>Data Needed:</p> <ul style="list-style-type: none"> • Question E.1 in the HH question will provide information for establishing averages on quantity produced, and quantity marketed for a particular priority crop in 2009 and 2012. • B 1.8 and D.1.1 will provide information on average acreage under the crop in 2009 and 2012. This information will be used for computing average yields in 2009 and 2012 • Content analysis of responses from key informant interviews and FGDs <p><u>Analysis needed</u></p> <ul style="list-style-type: none"> • Compare whether the means for 2009 and 2012 are statistically different for client and control HHs • Compare proportional change in the mean yields, quantity marketed and production for client and control households

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>3. Explanations for the perceived changes in crop yields, production and incomes;</p>	<p>Strategy: <u>Quantitative</u> Quantitative information generated from the questionnaire on use of purchased inputs, production practices, labor use, changes in area under the crop, and reasons for observed change in total production will primarily be used to answer this question with regards to changes in crop yields and production.</p> <p>Changes in number of incomes sources and relative importance of the various sources will generate information on the livelihood strategies employed by the household in 2009 and 2013</p> <p><u>Qualitative</u> The focus group discussions and key informants will provide qualitative information on general trends in crop production, yields and incomes. They will also provide reasons to explain the changes</p> <p><u>Data sources</u></p> <ul style="list-style-type: none"> • Questionnaire survey • Key informant interviews and • FGDs 	<p>Data Needed:</p> <ul style="list-style-type: none"> • A4 will provide information on sources of income and their relative importance in 2009 and 2013 which will help explain changes in incomes • D.1.1 and B.1.8 will provide data on average areas under the crop to explain changes in production and enable comparison between 2009 and 2012 • D.1.2 to D.1.5 will provide data on use of purchased inputs to help explain changes in production and yields • D.1.6 and 1.7 will provide information on use of hired labor for field production activities which will explain production trends • D.1.8 will provide data on marketing arrangements used by the farmer which will help pointers to explain the trends in incomes. • E.2 will provide information to explain the changes in production and hence yields • E.3 will provided information on the factors that influenced performance of the various crops <p><u>Analysis needed</u></p> <ul style="list-style-type: none"> • Cross tabulations to compare the proportions using purchased inputs, hiring services and using hired labor in 2012 and in 2009. Chi-square tests to establish extent association between these variables and status of the HH (client or control) • Compare whether the averages for quantities of improved seed, fertilizer, value of herbicides, crop protection chemicals are statistically different in 2009 and 2012 and between client and control HH • Compare proportional change in the average quantities for client and control households <p>Interviews</p> <ul style="list-style-type: none"> • Household interviews • Agric loans officers • Extension Service providers • Produce buyers linked to the project • Input supplier linked to the project

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>4. Estimations of new jobs created by/for farmer clients;</p>	<p>Strategy: <u>Quantitative</u> The household surveys will provide information for establishing the average number of man days of hired labor used in production of priority crops in 2009 and 2013. Likewise information on average number of people employed to work on off/non-farm activities will help to generate answers to this question</p> <p><u>Data sources</u></p> <ul style="list-style-type: none"> • Questionnaire survey 	<p>Data Needed: D.1.6 and D.1.7 will provide information on use of hired labor in production of priority crops in 2009 and 2012. The difference between the two years will help to estimate new jobs created F.5.2 and F.5.3 will also provide information on average number of people working in other business activities in 2009 and 2013</p> <p><u>Analysis need</u></p> <ul style="list-style-type: none"> • Compare whether the average man days of hired labor and number of people employed in 2009 and 2013 are statistically different • Compare proportional change in the average man-days of hired labor in production of priority crop and number of people employed in other business activities for client and control households
<p>5. Basic household profiles (sex and marital status of borrower, family size, family member ages, earning status of members, plots worked/land ownership, financial services used, etc.);</p>	<p>Strategy: <u>Quantitative</u> Quantitative information from the questionnaire survey on sex of respondent, household head and wife, household size and composition, year of birth of household members and primary occupation of the household member will provide answers to this question. HH survey questions on land ownership and utilization as well as access to financial services will answer the question.</p> <p><u>Qualitative</u> The focus group discussions and key informants will provide qualitative information on general trends in financial services access, constraints, and challenges. They will also provide reasons to explain the changes</p> <p><u>Data sources</u></p> <ul style="list-style-type: none"> • Questionnaire survey • Key informant interviews and • FGDs • Secondary bank data on repayment rates, loan terms, gender and age of borrowers. 	<p>Data Needed:</p> <ul style="list-style-type: none"> • A.2 and A.3 will provide data on sex and marital status of borrower, family size, family member ages and earning status of members • B.1 will provide information on average land owned and land under cultivation. • C.1-17 will provide information on awareness, access to and utilization of financial services <p><u>Analysis needed</u></p> <ul style="list-style-type: none"> • Descriptive statistics (percentage and means) on sex and marital status of borrower, family size family member ages and earning status. Cross tabulations to enable comparison between client and control households • Compare average land owned, cultivated and under priority crop in 2009 and 2013. Test for statistical significance of the difference in the means • Compare proportional change in the means for client and control households • Cross tabulations to compare awareness, access and utilization of financial services between clients and control as well as before and after the program <p>Key informant Interviews</p> <ul style="list-style-type: none"> • Agric loans officers • Extension Service providers • Produce buyers linked to the project • Input supplier linked to the project

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>6. Information on how the loan was used and resulting changes in the production practices;</p>	<p>Strategy <u>Quantitative</u> The household survey will provide information for understanding the crop and other purposes for which the loan funds were used. The questionnaire will also help provide information on the specific type of service, or inputs on which loan funds were used. Comparison of averages in quantities/value of the inputs services used in 2009 and 2013 will help to delineate effect of the loan on production</p> <p><u>Qualitative</u> Information from focus group discussions on how the loan funds are used, changes in practices and effect of those changes on production and household well-being</p>	<p>Data Needed: C..7 will provide data on purpose for which the loan was used D.1 will provide data on how the loan was use E.1 will provide data on resulting changes on production E.4 will provide data on how the loan affected intra household decision making with regards to production of the priority crop F1 to F.5 will provide information on resulting changes to household well-being</p>

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>7. Changes in school attendance for children;</p>	<p>Strategy</p> <ul style="list-style-type: none"> • The results of this analysis should show whether there is any significant educational benefit from the MasterCard financed agricultural credit. • The test will be for significant differences in proportion of school age children attending school as a result of the credit. • Both a before and after analysis and a with and without comparison against control households will be done. 	<p>Strategy</p> <ul style="list-style-type: none"> • The primary variable is the proportion of school age children attending school will be calculated from the data in table A 3. The proportion in 2009 will be compared with the proportion now. • The proportion of children in private school and the proportion of children in Boarding School will be used as additional indicators of quality of education and compared over time/ against control group. • In section F2. respondents are asked to compare the number of days students missed school as a result of late payment of fees between 2009 and now. • There will also be an index of the severity of educational problems caused by lack of funds. The ratings of the four questions F2.2 to 2.5 will be added together and the average total compared between years and against control group. • Additional comparisons by country, crop, and gender using cross tabs will be informative in understanding the determinants of the change. • Lastly, there is a question (H5) on ability to pay for education. The average starting score in 2009 on ability to meet household education needs will be compared between clients and control. Then the average rating score for extent of change in ability to meet education expenses will also be compared. This information will be used to triangulate the findings on change in access to education.

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
8. Changes in usage of healthcare services;	<p>Strategy</p> <ul style="list-style-type: none"> • The results of this analysis should show whether there is any significant health care benefit from the MasterCard financed agricultural credit. • The test will be for significant differences in access to health care services as a result of the credit. • Both a before and after analysis and a with and without comparison against control households will be done. 	<p>Strategy</p> <ul style="list-style-type: none"> • The primary variable is the household rating of the change in access to health care services since 2009 as rated in Question F.3. The average rating for loan clients will be compared with the control group and against their perception of general trends in health care for the community at large. • The proportion of health care from private vs. public sources will be used as additional indicator of quality of education and compared over time and against the control group. • There will also be an index of the severity of problems related to health care access caused by lack of funds. The ratings of the three questions F3.4 to 3.6 will be added together and the average total compared between years and against control group. • Additional comparisons by country, crop, and gender using cross tabs will be informative in understanding the determinants of the change. • Lastly, there is a question (H4) on ability to pay for health care. The average starting score in 2009 on ability to meet household health care needs will be compared between clients and control. Then the average rating score for extent of change in ability to meet health care expenses will also be compared. This information will be used to triangulate the findings on change in access to health.
9. Data on changes in household assets;	<p>Strategy</p> <ul style="list-style-type: none"> • The results of this study should show us whether access to agricultural credit has resulted in greater availability of assets in the client households. • The test will be for significant differences in asset acquisition since 2009 between beneficiaries and the control group. 	<p>Strategy</p> <ul style="list-style-type: none"> • Asset acquisition is determined in section I of the questionnaire. There are 5 key variables. Commercial land, Commercial Buildings, Acres of land for agricultural production, Household/production assets (a weighted index derived from table I.2 and Livestock (a weighted index derived from table I.3) • They primary comparison is average scores for clients compared to control group. • Additional comparisons by country, crop, and gender using cross tabs will be informative in further understanding the dynamics of the change.

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
10. Perceived impact on household food security;	<p>Strategy</p> <ul style="list-style-type: none"> The results of this study should show us whether access to agricultural credit has resulted in a significant improvement in household food security for client households. The test will be for significant change in the food security index between 2009 and now compared to the control group. <p><u>Qualitative</u> Content analysis of information from FGDs and KII will enrich understanding of the changes in food security and the reasons for those changes.</p>	<p>Strategy</p> <ul style="list-style-type: none"> The food security index is calculated from data collected in table F4. Households will be categorized as 1. food secure, 2. Mildly food insecure, 3. moderately food insecure or 4 severely food insecure using the USAID methodology for scoring the Household Food Security Assessment Index. The average current food security rating will be compared against the control group to test for significant differences in proportion. Furthermore, the table will be scored in relationship to severity of food security on a point scale from 0 to 135 (question number times frequency rating) in 2009 compared to the same score in 2013. The average change between the two scores will be compared between client and control groups. Additional comparisons by country, crop, and gender using cross tabs will be informative in further understanding the dynamics of the change. In addition there is a question (H1) on ability to pay for food. The average starting score in 2009 on ability to meet household food expenditure needs will be compared between clients and control. Then the average rating score for extent of change in ability to meet food expenses will also be compared. This information will be used to triangulate the findings on food security.

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>11. Farmer factors for success (appreciative inquiry); and</p>	<p>Strategy</p> <ul style="list-style-type: none"> • The study should help Opportunity Bank to identify those characteristics that lend themselves to significant impact as a result of agricultural credit. • This information will be useful in targeting agricultural credit investments in the future. • Comparisons between crops, countries and gender as well as by age, and educational status of the borrower will be informative. <p><u>Qualitative</u></p> <ul style="list-style-type: none"> • Content analysis of information from FGDs and KII will enrich understanding of the farmer factors for success. 	<p>Strategy</p> <ul style="list-style-type: none"> • All of the cross tab analysis assessing the impact of crop, gender, country on the change in standard of living, income, education, health care and food security will contribute to this analysis. • Additional analysis of impact of age and education of borrower may be useful. • The survey results will be supplemented by the value chain analysis which should inform our understanding of the challenges in a given crop value chain that impact on the potential impact of credit access. • Understanding the dynamics of the relationship between borrowers and the bank, the input suppliers, the produce buyers, and the extension service providers will be provided by the key informant interviews. The focus group discussions with farmers will also highlight the nature of the challenges and changes in these relationships and the way they affect the impact of credit on the household. • Lastly, an assessment of the most significant changes experienced by the different categories of players will be used to highlight ways in which the program suffered from unexpected challenges, or benefitted from serendipitous synergies, and to highlight ways to adjust future interactions to maximize the positive impact of credit and control for negative consequences. Content analysis will be used to summarize the lessons from these qualitative stories. The findings can then be used to inform problem solving strategic planning sessions going forward.

Review Topic	Data Sources, Next Strategies	Further Data Needed, Data Sources (How will we answer it?)
<p>12. Effectiveness of household profiling and/or land mapping in increasing productivity of farms and improving Opportunity's services in Ghana.</p>	<p>Strategy The Citibank Study itself has a number of objectives to test the impact of profiling both as a with and without and as a before and after study. The MasterCard Survey will act as the baseline position against which future impact will be assessed in one year's time.</p> <ul style="list-style-type: none"> a) Assess the effectiveness of using household profiling and mapping as a predictable indicator of repayment for lending to farmers in Ghana. b) Document the contextual opportunities/challenges. c) Assess to what extent the system can be easily transferred and replicated and in what areas modifications are necessary when expanding to new countries. d) Analyze increases in productivity of farms supported using the new system (compared to those who are not part of the program). 	<p>Strategy The strategies used to respond to each of these objectives will differ.</p> <p>Data sources will be both quantitative and qualitative.</p> <ul style="list-style-type: none"> a) Statistical comparison of current repayment rates for profiled clients compared to non-profiled clients. This will depend on the available information from which such repayment rates can be calculated. b) Analysis based on analysis of key informant interviews of key bank staff in Ghana. Critical to what difference the use of profiling actually makes in bank operations. What are the costs and benefits derived from profiling from the bank's perspective. How could profiling be managed differently to achieve greater optimization of effort and greater impact. c) Discuss with bank staff in Ghana to understand what institutional factors are critical to the successful utilization of profiling. Discussion with bank staff in Uganda and Malawi of what institutional constraints might exist to impede adoption of profiling in their respective bank operations. d) Use of the MasterCard impact survey to document the baseline situation in terms of yield, income, standard of living and food security for bank clients as discussed above. Compare profiled against non-profiled clients in Ghana to the extent currently possible at this point in time. Repeat the data collection in Ghana after 12 months to assess the change in wellbeing indicators and whether that change is greater for profiled clients compared to the control group that was not profiled. Critical challenge will be to design the appropriate counterfactual for testing these differences. This will require additional information from the management in Ghana to understand the way in which profiling will be conducted going forward.

Annex 3. List of Key Informant Respondents Interviewed by Country

Contact information of respondents is confidential; please contact Opportunity International to request this information.

Annex 4. Summary of Opportunity Bank Agricultural Loan Arrangements by Country and Crop⁴²

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
Uganda							
Coffee Masaka	Started mid 2011. 1st cycle 500,000/= 2nd cycle up to 1million. Usually 8-10 months Interest rate 24%. (3% for 8 months). Repay interest monthly and then principle for the last 3 months. Deposit required is 15% of loan - was 20% at first. Collateral like land held for groups by the bank. The Group members guarantee each other.	Combination of inputs and cash. Varies by group.	Varies. No standard Package. Input supplier identified by the group not the bank. Some groups buy inputs collectively. Others individually. Some get from their cooperative or ESP.	A wide range of extension providers involved. USAID LEAD Project biggest but closing. VI Agro-forestry closing. Lutheran World Relief, UCA, Nucafe, UCDA, Cooperatives, NAADS. Level of cooperation with Opportunity varies greatly. Most don't have MOUs. No standard training package. Not all clients trained.	Coffee Market Highly Competitive. Many buyers. Some groups affiliated with strong cooperative marketing. Some sell collectively. A few have fair trade registration. Most sell for cash and then pay Bank.	Opportunity perceived as a more trusted financial partner. Other established banks not lending to smaller farmers. Interest rate from Opportunity is lower than at SACCOs.	Kibinge Cooperative has their own SACCO. Clear conflict of interest as would prefer members to borrow internally. 2012 was a bad year in terms of weather. The main season crop failed and loans had to be extended until after the fly crop. Many farmers forced to pay from other sources. Centenary Bank very entrenched in Masaka. It is well known and lending individually to larger farmers. 50km radius limit restricts potential access for most of the Societies belonging to the Masaka Cooperative Union who would really like to join in.

⁴² Our understanding of the partnership arrangements is based on input provided by the ESPs, input dealers, off takers, bank staff and clients, so it sees the configuration from a multi-dimensional perspective as at the time of the study.

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
<p>Maize/ Irish Potatoes Kyenjojo</p>	<p>Started mid 2011. 1st cycle 4 months 500,000/= (Irish). 2nd cycle 6 months up to 1million (Maize). 3rd Cycle 9 months 1.5million max. Interest rate 2.5%/month. Groups encouraged to pay every month. Some pay only interest monthly and then principle at once at harvest. Deposit required is 15% of loan but also required to save every month. Group members guarantee each other. Minimum group size set at 20. 50km radius limit on distance from Opportunity branch.</p>	<p>Cash deposited into member account.</p>	<p>Each farmer buys own inputs. Many farmers not buying any improved inputs. No recommended package</p>	<p>Extension training very limited. Most groups not getting any agronomic training. Only financial management training from Opportunity. No formal relationship between Opportunity and the DFA or NAADS.</p>	<p>Market highly competitive. Many buyers. Each farmer sells individually. No group contracts. No collective marketing</p>	<p>There are no other financial providers offering agricultural loans. Agriculture has increased loan portfolio dramatically.</p>	<p>Very competitive market. Farmers not selling in an organized way. This makes collecting repayment difficult. This is reason groups encouraged to pay monthly to reduce risk of default.</p>

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
Cotton Iganga	Started 2011. Average loan size is 400,000/acre. 7 month loan period. Interest rate 3%/month. Pay interest monthly then principle at once at harvest. Deposit required is 15% of loan. Group members guarantee each other. Groups used physical collateral to collect from defaulting members.	Loan broken into two, cash after inputs once they verify that you planted. Inputs takes about 45% of the loan.	Some inputs supplied by Ginnery at prices subsidized by Uganda Ginners and Exporters Assoc. Others from identified input supplier. Opportunity pays input supplier directly. Ginnery offers tractor hire services also, or available from private sector. Farmers pay cash.	Ginnery has own field extension staff who advise farmers on cotton production. Four trainings per year to cover the crop cycle, but extension staff also visit to monitor and advise. UCDA has demonstrations. Formerly supported by USAID through APEP and TechnoServe, but project ended.	Farmers contracted to sell to Mutuma Commercial Agencies. Price set by the Ginners Association. Indicative price announced but actual price at harvest based on world market conditions.	In Iganga Centenary loans to individual farmers. But Opportunity was the first to offer agricultural package to small farmer groups with repayment at harvest. Now Tropical Bank offers ag. loans paid at harvest. Post bank payment after 6 months.	Price collapsed in 2011 following two previous years of very high prices. This combined with poor harvest due to weather conditions. Farmers made losses. Farmers forced to pay but very unhappy. Recovery rate 95%. More than half of farmers dropped out and did not grow cotton the following year. Number slowly increasing.
Maize Iganga	6 month loan period. Loan amounts ??? Interest 2.5% per month. Pay interest monthly then principle at once at harvest. Deposit required is 15% of loan. Group members guarantee each other.	Initially was inputs plus cash but now all cash	Farmers identify own input supplier. Input dealers paid directly in 2011 but not in 2012. Now farmers buy own inputs.	No fixed ESP. Africa 2000 supposed to be involved but seems to be only handling soybeans. Not working with NAADS.	Had a contracted buyer in 2011 but not in 2012. Some groups had good experience selling collectively. Others sell individually.	See above.	Competitive market with many buyers. Not possible to pre-contract price. Problems of side selling. But prices have generally been good.

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
<p>Sugar</p> <p>Iganga</p>	<p>20 month loan. Lending 1million per acre. Minimum 2 acres, maximum 20. Interest rate started at 3% but lowered to 2.5% after Oct 2011. Interest paid quarterly. Principal paid at once at harvest. Deposit required is 15%. Group members guarantee each other. (Manager says rate is 2.25% on group loans larger than 2 million.)</p>	<p>Cash released in tranches. First for seed cane and tractor hire. Money for labor released after planting confirmed. Seed cane alone takes about half the loan. Some farmers use borrowing for land rental as well.</p>	<p>Seed cane from Sugar factory or other farmers. Tractor hire may be from Sugar company or open market.</p> <p>SAIL does have some "aided" farmers it assists with inputs and tractor service directly, but could not manage all the farmers needed.</p>	<p>Sugar factory has its own extension staff to monitor and ensure best practices. Not currently recommending fertilizer because land still virgin.</p>	<p>In Mayuge the farmers belong to an independent association that is not yet contracted to one sugar factory so still independent. Once SAIL goes online they will have to decide who to contract with.</p> <p>The others contracted with SAIL. Must register to get cutting permit.</p>	<p>Promoted rapid expansion in sugar cane acreage for the new factory. Cane can be cut four times over 6 years. Most of the production costs incurred during establishment. Minimal costs for later cuttings. Repaying the loan takes almost all the returns from the first cutting, but high profits in subsequent seasons.</p>	<p>The new factory was not online yet when first loans came due in December 2012. Still not operational, so most farmers have not sold their cane and cannot pay loans. Those in Mayuge could sell to the other company, but some were not registered and did not have cutting permits. Cane quality still good for another couple of months.</p> <p>Ideally farmers should be staggering their planting by adding some acreage each season to smooth out their household revenue flows. But farmers not allowed to take a second loan until first loan paid in full. This is not best practice.</p>

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
Ghana							
<p>Cocoa Kejetia</p>	<p>Perennial crop. . Inputs applied during the main production season (once a year) but there are two harvest seasons - the main crop and the fly crop from that one loan. Loan Amount depends on acres and cost of inputs. First cycle limited to 2 acres. . 2nd cycle 3 acres. . Third cycle is limited to 4 acres. Interest is 3%/month for 9 months (27% total). . Supposed to pay in 4 monthly instalments from Oct to Jan. 1% insurance. Pay interest monthly. Deposit required is 10% of the loan value. Group guarantees the members. Difficult to sell off collateral. Rely on member deposits to cover for defaulters.</p>	<p>Fertilizer (50 kg NPK/acre and 100kg/acre of Sulphate of ammonia), Insecticide (fungicide Kocide = copper sulphide), Pre and post emergent herbicides. Some farmers take backpack sprayers and personal protection equipment (PPEs). Some groups get a mist blower at the group level.</p>	<p>Opportunity negotiates and buys inputs directly from input suppliers. Orders based on number of farmers who have paid deposit. Fertilizer prices set by government, but supplies always delivered late and prices often change after OISL has already announced loan package to farmers. OISL might have to consider stocking own inputs to get early at official prices and ensure timely delivery.</p>	<p>A number of ESPs have been involved including ENTREPID, , Technoserve (works with government extension agents), Millennium Villages Project, and ACDI/VOCA. ACDI/VOCA has farmer education center. Others provide direct farmer training. Some buyers like Armajaro also training farmers on improved production practices. Farmer Field School approach only used by MVP. Most do not do demonstrations. Maybe 30% of all cocoa farmers actually trained.</p>	<p>Government Cocoa Board sets prices and licenses buyers. Bag sizes standard. Buyers keep passbooks to record sales. Armajaro buys for the Certified Fair Trade market - pays a bonus of about 8 cedi per bag, but not until the end of the entire marketing season. None of the off-takers pay into client bank accounts. Off-takers fear to lose customers if they pay the bank. This leaves OISL to collect from the groups. Main incentive to pay is the desire to get the next round of credit.</p>	<p>Input companies and some buyers used to offer credit, but stopped because of problems with side selling. There is no other agricultural credit available to cocoa farmers.</p>	<p>2012 was a bad year for weather. Much of the main crop failed so farmers had to pay from their fly crop. This delayed ability to pay the deposit on time, and limited ability to qualify for their next cycle loan. Even for those who register, inputs will be late for the season. Fertilizer price for this year not yet announced by government, and price has risen sharply due to competition for available stocks. Seems part of government plan to reduce the level of subsidy.</p>

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
<p>Maize Techiman</p>	<p>Deposit is 10% of the loan. Loan period is 6 months. 2 seasons per year. Group size 10-20. Loan amount depends on area in the crop and cost of inputs package. First Cycle 1-3 acres. May add in second cycle but maximum is still 3 acres. 1% insurance fee. 18% interest (3%/month for 6 months). Interest is paid monthly. 50% is principal is paid in Month 3. The balance is paid at time of harvest. Groups Guarantee members.</p>	<p>Seeds, Fertilizer (DAP and Sulphate of Ammonia), pre-emergent Weedicide and Post emergent Weedicide.</p>	<p>Inputs bought directly by OISL and delivered to the groups. Standard input package.</p>	<p>Concern is the main ESP. Offers training, monitoring, collection centers for collective marketing, and trains in post harvest handling. Links to off-takers. Provided stores, weigh scales, moisture meters, and shellers.</p>	<p>There are several off-takers who buy from farmers once a lorry load is ready at the collection center. But not all communities have collection centers. Off-taker claims prices better because he weighs a bag at 130 kg compared to 180kg/bag when selling to the market women. Farmers agree price is better. Off-taker not following agreement to pay into the bank. Farmers complain of problems with weights, and lack of transparency on part of off-taker.</p>	<p>Most farmers have other income sources. Part payment of principal half way through the season helps limit defaults.</p>	<p>There was a problem with rainfall in the main season in 2012. Most crops failed and farmers has to pay after the minor season. 60% paid late, but eventually default fell to about 10% by end of minor season.</p>

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
Onions Ashaiman	6 month loans. Two seasons/year. Interest 3%/month (18% in total). Pay half after 3 months. Pay interest monthly. Mandatory 10% deposit before qualifies for loan. Group guarantees members. Difficult to collect on collateral. Depend on deposit to cover defaulters.	Cash. . Many borrowers used loans to purchase irrigation pumps or rented land to expand production. . Also buy seeds, fertilizer and chemicals.	Each farmer identifies own input supplier and purchases inputs with cash.	There is no ESP. Some extension support from government extension staff, but have to go to them. They rarely come to train.	Lots of small produce buyers. Private buyers collect the produce from their "customers" at farm gate and take to sell wholesale in ACCRA. Prices set by forces of supply and demand. Most can't pay cash, they collect produce, sell and pay the farmers after sold - but within just a few days.	Group solidarity is high. Most farmers have alternative income sources from which they pay off loans.	No major challenges noted. Default rate low because people want the next loan.
Chilies Ashaiman	6 month loans. Two seasons/year. Interest 3%/month (18% in total). Pay half after 3 months. Pay interest monthly. Mandatory 10% deposit before qualifies for loan. Group guarantees members. Difficult to collect on collateral. Depend on deposit to cover defaulters.	Cash. Buy seeds, fertilizer and chemicals. Many farmers rented land to expand production. Others used cash to expand local salt extraction business.	Each farmer identifies own input supplier and purchases inputs with cash.	There is no ESP. No extension support from government extension staff. OISL Agric Officer is providing training on agronomy and production best practices..	Lots of small produce buyers. Private buyers collect the produce from their "customers" at farm gate and take to sell wholesale in ACCRA. Prices set by forces of supply and demand. Most can't pay cash, they collect produce, sell and pay the farmers after sold - but within just a few days.	Group solidarity is high. Most farmers have alternative income sources from which they pay off loans. Many are doing local salt extraction, which is also a seasonal source of income.	No major challenges noted. Default rate low because people want the next loan.

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
Malawi							
<p>Tobacco</p> <p>Dowa and Kasungu</p>	<p>Loan given to clubs and not individual farmers. Clubs have to open accounts in the bank. OIBM assess the feasibility of the loans (acres, inputs required etc) and give the loan. Bank demands for loan security fund for each hectare which is 30,000 Kwacha (USD 100) about 15% in case of JTI and up to 50% in case of Alliance One. OIBM charges an interest of 42%. Upon selling the tobacco, funds are deposited into the club account in the bank. Then the bank deducts the loan amount.</p>	<p>Composition depends on the company linking farmers to the bank. JTI only provides inputs while Alliance One also provided cash of USD 150 paid in monthly instalments of \$50 in addition to the inputs (nyonga seed pack, fertilizer, tree seedlings, polythene roll, nyonga land field)</p>	<p>The tobacco company (JTI & Alliance One) identifies input suppliers. The ESP Field Leaf Officers establish the input needs of each club at the start of the season. The suppliers deliver to the ESP which distributes to each club. Club counter signs a delivery note on receipt. Club leaders distribute to members according to Ha. 5 clubs form a zone. Zone has an elected committee of 3. Zone leaders help in monitoring to ensure fairness in the distribution of inputs to individual members. The delivery notes are compiled and sent to the bank to pay the supplier.</p>	<p>It's the field officer of the company (ESP) which links farmers to particular banks. The ESP guarantees the loans given to the clubs. ESP provides training to farmers on:-</p> <p>Nursery management; Field cultural practices (pudding, spacing; planting depth, fertilizer application; Weed control</p> <p>Topping and de-suckering</p> <p>Curing, offloading from barns, sticking and storage; grading baling and dispatching to the auction floors</p>	<p>ESPs do ensure the market for farmers. The tobacco is sold through government run Auction Floors but each company which engages farmer clubs to grow tobacco on a forward contract arrangement is allocated a day on the floor for them to formally buy the tobacco from farmers. Payment is made directly to the club accounts in the bank. The bank then deducts the loan and interest</p>	<p>Other banks notably National Bank of Malawi and Malawi Savings Bank also provide alternative financing options to the farmer clubs. The ESP field officers by and large influence the farmers as to which bank they go for loan services</p>	<p>Weather is main production constraint facing farmers.</p> <p>Low prices. Tobacco production is affected by international market price volatility. Farmers respond by reducing acreage under the crop.</p> <p>Information gap in case of the farmers with regards to cost of the inputs, interest and how it charged</p>

Table 30. Agricultural Loan Arrangements by Country and Crop

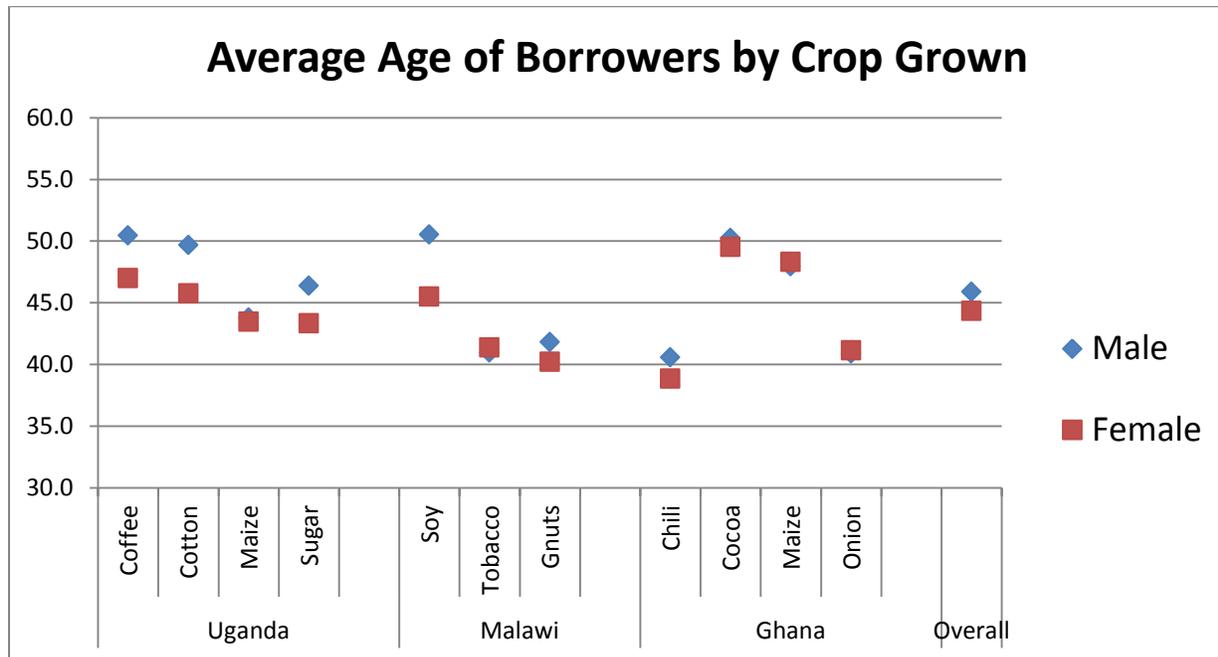
Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
<p>Ground-nuts</p> <p>Dowa</p>	<p>Bank gave the loan to an individual wholesaler (Chitsosa Trading) who then engages the farmers on his own terms. Farmers were given 10 kg of seed and had to pay back 20 kg of groundnuts after harvest</p>	<p>The loan received by farmers consisted only 10 kg of seed</p>	<p>The seed was supplied by Chitsosa Trading which was agency administering loans to farmers</p>	<p>Chitsosa organized some demonstrations but these were distant. Hence limited participation in the training. Chitsosa Trading also engages lead farmers to provide extension advice to the others but these people have no formal training in agriculture, neither have they been given skills in this area</p>	<p>Chitsosa trading also buys the produce from farmers. However the farmers are also at liberty to sell to any other farmers</p>	<p>The small farmers basically have no alternatives to access credit</p> <p>Loans provide access to a high yielding variety</p> <p>Farmers willing to borrow to again.</p>	<p>Unfavorable weather limited the yields.</p> <p>Limited quantity of seed provided to farmers did limit the impact on livelihoods</p> <p>Lack of direct contact/ relationship between the bank and the farmer groups</p>

Table 30. Agricultural Loan Arrangements by Country and Crop

Crop / Location	Terms and conditions:	Loan composition	Relationship to Input Supplier	Extension & Training	Relationship to Buyer/ Marketing	Key contributions:	Key challenges
<p>Ntchisi</p> <p>Soya</p>	<p>Bank gave the loan to an individual wholesaler (GALA) who then engages the farmers on his own terms. Farmers were given inputs (10 kg of seed, 1 litre of fertilizer and fungicide) and they had to pay back in kind using soy produce after harvest. Pay back 3 times quantity of seed received; for 1 quib of chemical expected 30 kg, for each empty gunny bag expected 560 grams of soya.</p>	<p>Soy seed, fertilizer and pesticide</p>	<p>GALA was also the input supplier</p>	<p>Farmers did not receive any training on how best to grow the crop to increase production.</p>	<p>No relationship with a particular buyer. Farmers sell to middle men</p>	<p>No clear alternatives unless OIBM bank directly engages with these groups</p>	<p>Late delivery of seed led to late planting hence crop suffered water stress at critical periods of plant growth</p> <p>GALA was not transparent with the farmers as he did not provide all information regarding repayment terms at the outset.</p> <p>Lack of direct contact between the bank and the farmer groups, this allowed GALA to take advantage of the farmers</p> <p>Lack of ready market for the farmers produce .</p>

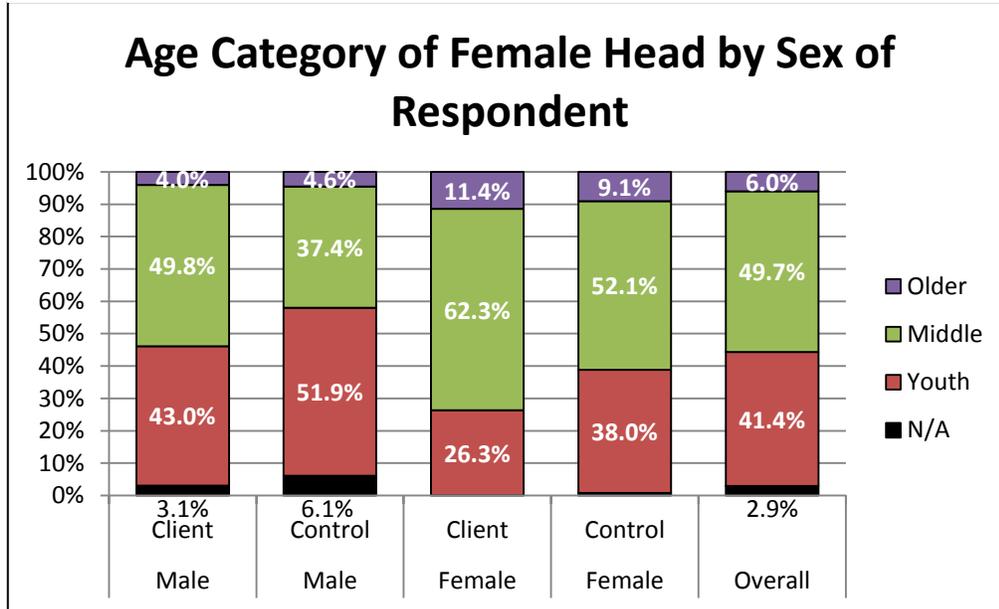
Annex 5. Descriptive Statistics

Figure 35. Average Age of Borrowers by Crop Grown



Observation: Average age is highest for coffee, cocoa, soy and cotton and lowest for chili, groundnuts, and onion. As expected, male farmers are generally older than female farmers.

Figure 36. Age Category of Female Head by Sex of Respondent

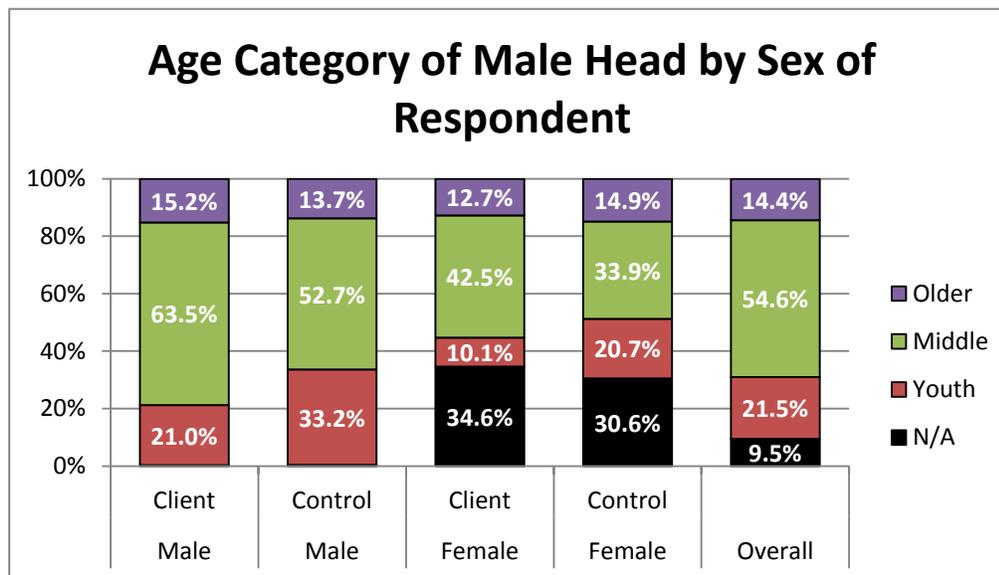


Note: Youth is defined as 35 years or younger. Middle age is 36 to 60, while over 60 is defined as older.

Not Applicable refers to those households where the respondent is single and therefore has no wife whose age can be reported.

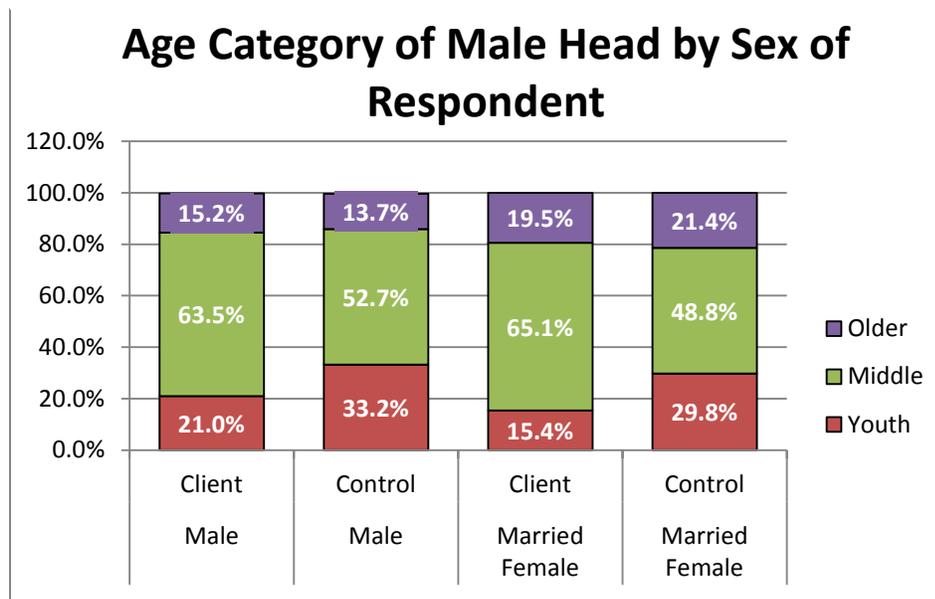
Observation: Among clients the proportion of youth is much smaller for both men (21%) and women (26.3%). While the wives of male borrowers tend to be younger, the women who borrow on their own behalf, or who are members of groups with an interest to borrow in the future, tend to be much more likely to be middle aged or older. In turn, the married women farmers who borrow or are interested in borrowing on their own behalf, tend to have husbands who are significantly older. Very few husbands of female respondents fall into the youth category.

Figure 37. Age Category of Male Head by Sex of Respondent



Note: The large number of not applicable, with respect to Female Clients and Control Females represents those women who are female heads of households with no male head whose age can be reported. Age of Male Head is not applicable because there is no Male head of household.

Figure 38. Age Category of Male Head by Sex of Respondent



Note: When the analysis looks only at the married female client respondents the considerably older age of their husbands can clearly be seen, while the profile for female control respondents has a larger proportion of both youth and older.

Marital Status of Respondents

Figure 39. Marital Status of Client

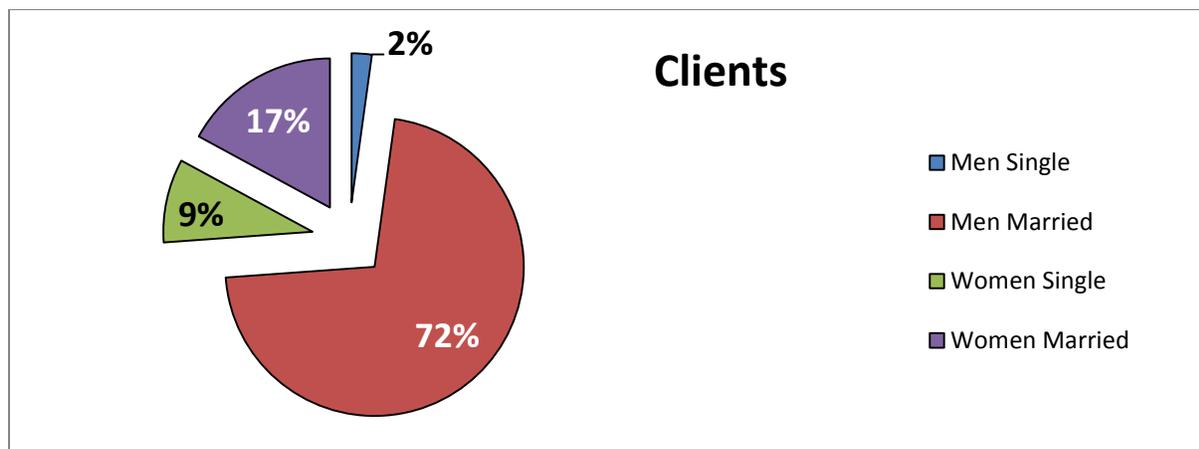


Figure 40. Marital Status of Control Group

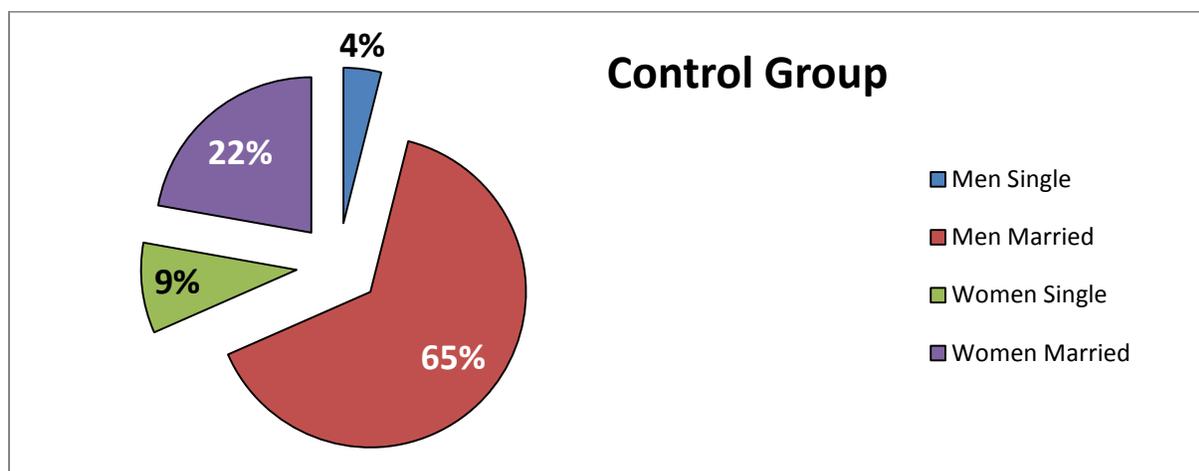
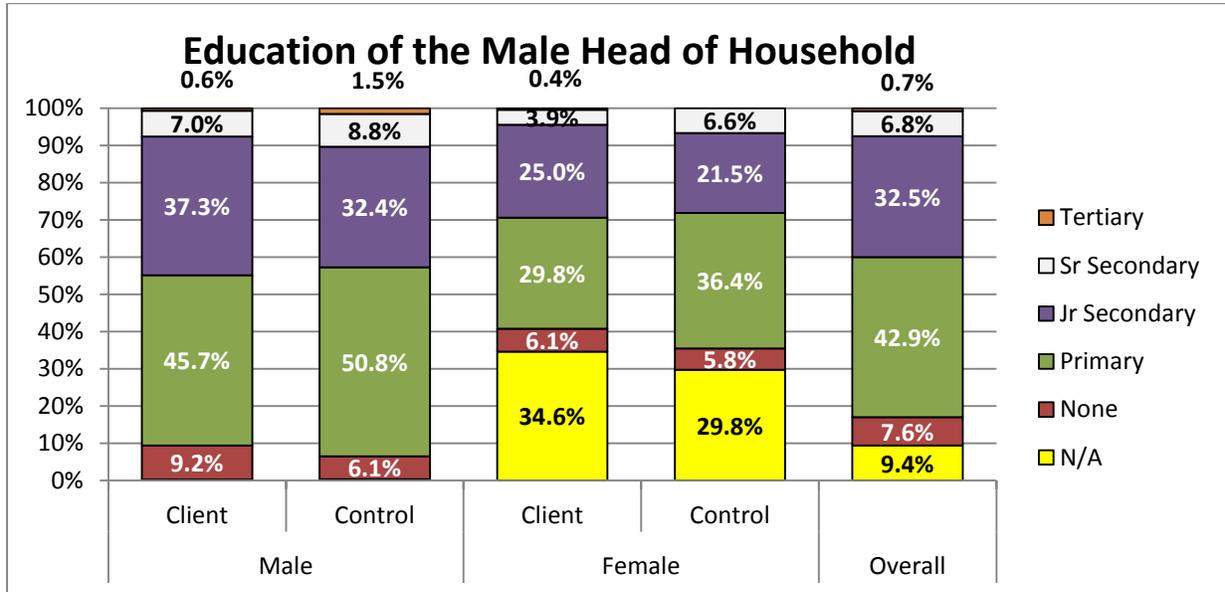


		Table 31. Gender and Marital Status of Respondents				Grand Total n= % women	
		Men		Women			
		Single	Married	Single	Married		
Uganda	Client	2.0%	98.0%	45.7%	54.3%	269	26.0%
	Control	8.9%	91.1%	31.0%	69.0%	141	20.6%
	Total	4.5%	95.5%	41.4%	58.6%	410	24.1%
Malawi	Client	0.5%	99.5%	16.4%	83.6%	282	25.9%
	Control	2.5%	97.5%	25.4%	74.6%	139	42.4%
	Total	1.0%	99.0%	20.5%	79.5%	421	31.4%
Ghana	Client	6.8%	93.2%	37.9%	62.1%	321	27.1%
	Control	4.3%	95.7%	36.4%	63.6%	103	32.0%
	Total	6.3%	93.8%	37.5%	62.5%	424	28.3%
Overall	Client	3.3%	96.7%	33.5%	66.5%	872	26.4%
	Control	5.7%	94.3%	29.8%	70.2%	383	31.6%
	Total	4.0%	96.0%	32.2%	67.8%	1255	28.0%

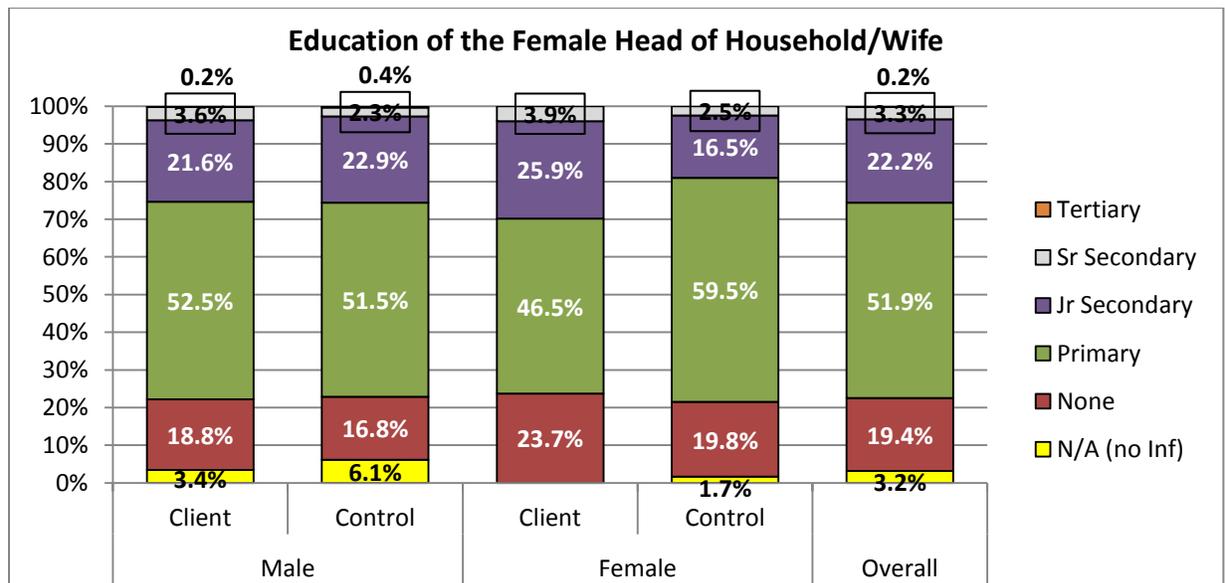
Education:

Figure 41. Education of the Male Head of Household



Not Applicable refers to those female-headed households where there is no male head whose level of education can be reported.

Figure 42. Education of the Female Head of Household/Wife



Observation: Female education levels appreciably lower than for males. Generally clients (male and female) somewhat better educated than the control respondents (i.e. higher proportion with senior secondary or tertiary education). This confirms the expectation that early adopters tend to be more educated.

Comparison of Clients and Controls With and Without Loans

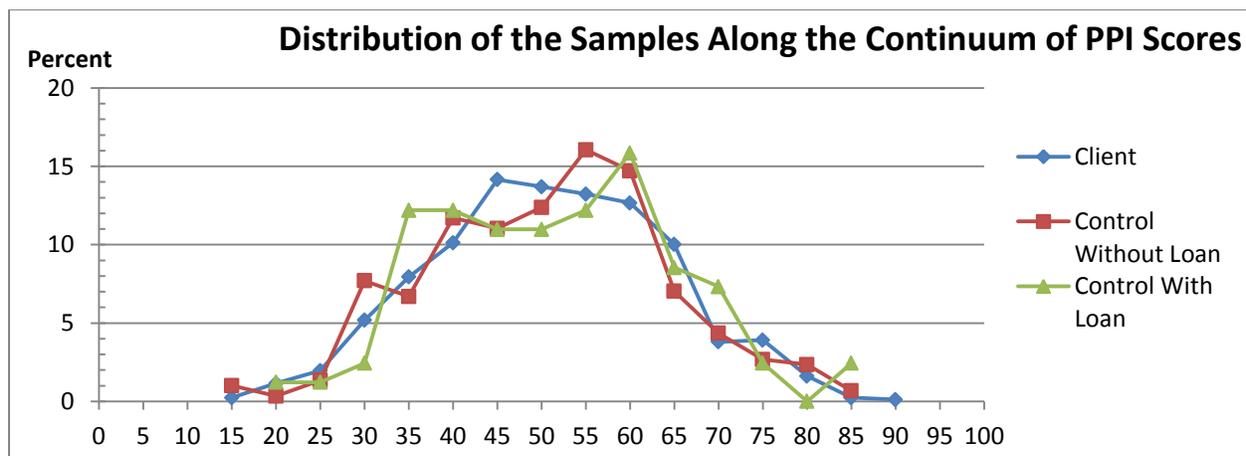
In light of the fact that about 20% of the control households were observed to have obtained loans since 2009, a comparison of populations was undertaken to ascertain whether these represented, in effect, a different population from the rest of the clients and controls. Comparison of clients and control respondents who either did or did not get a loan from any source tended to verify that the control respondents were comparable to the clients in 2009 and therefore a valid basis for comparison and assessment of the impact of the Opportunity loans on wellbeing as at 2012.

Table 32. Starting Position On the Social Standing Ladder by Status of Respondents	n=	Average Step on Ladder 2009	Standard Deviation
Clients	869	3.06	1.66
Control without loan	302	3.06	1.79
Control with loan	82	2.96	1.56
Grand Total	1254	3.05	1.68

Respondents were asked to position themselves on a social standing ladder for which step 1 was the poorest people in their community and step 10 the richest. They were then asked where they thought they had stood in 2009. Analysis of the mean and standard deviation of the 2009 step placement reveals no significant difference between clients and controls either with or without loans. Similar analysis was done for the PPI scores in 2009.

Table 33. Mean PPI Score by Household Status			
Recoded Status	n=	Mean PPI Score 2009	Standard Deviation PPI Score 2009
Client	872.00	48.83	13.03
Control Without Loan	301.00	48.75	13.27
Control With Loan	82.00	49.59	13.02
Grand Total	1,255.00	48.86	13.08

Figure 43. Distribution of the Samples Along the Continuum of PPI Scores



The above graph displays the distribution of households across PPI scores. All three samples demonstrate basically a normal distribution with an almost identical mean score as seen in the previous table.

Annex 6. Utilization of Financial Services

Figure 44. Action Taken by Opportunity to Recover

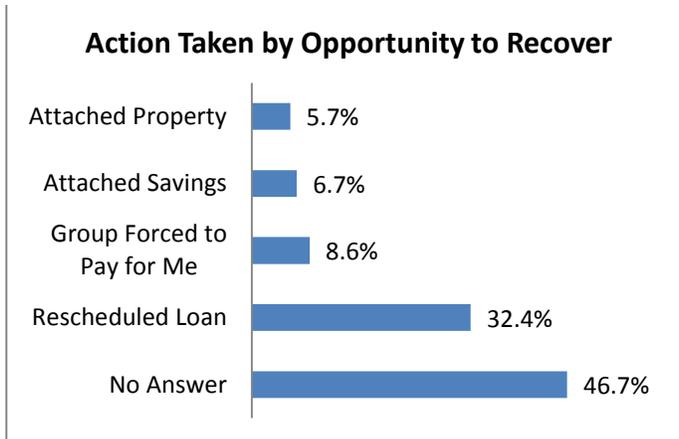


Figure 45. How Late Loan was Eventually Paid

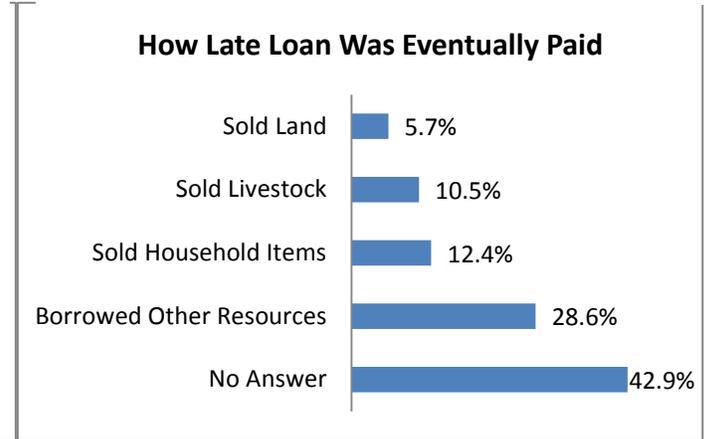


Table 34. Sources of all Loans

	Not specified	Opportunity	SACCO	MFI	Other Bank	Money Lender	n=
Client	0.1%	95.8%	0.7%	1.0%	2.0%	0.4%	1,395
Control	2.4%	45.2%	9.7%	16.9%	24.2%	1.6%	124
Overall	0.3%	91.7%	1.4%	2.3%	3.8%	0.5%	1,519
n=	4	1393	22	35	58	7	1,519

Observation: Nearly half of the loans to control farmers are from Opportunity in 2013. Loans to control farmers from other banks or MFIs combined can't equal the number from Opportunity. Rural Savings and Credit Cooperatives, which should be the most accessible in terms of location only constituted less than 10% of loans to control households and less than 1% of loans to clients.

Figure 46. Sources of Loans for Clients and Controls

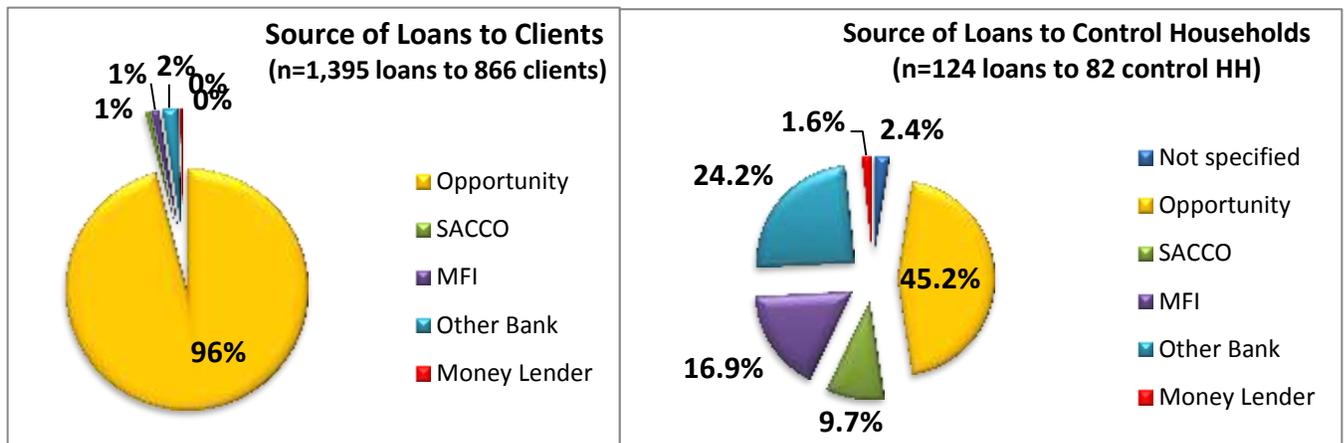
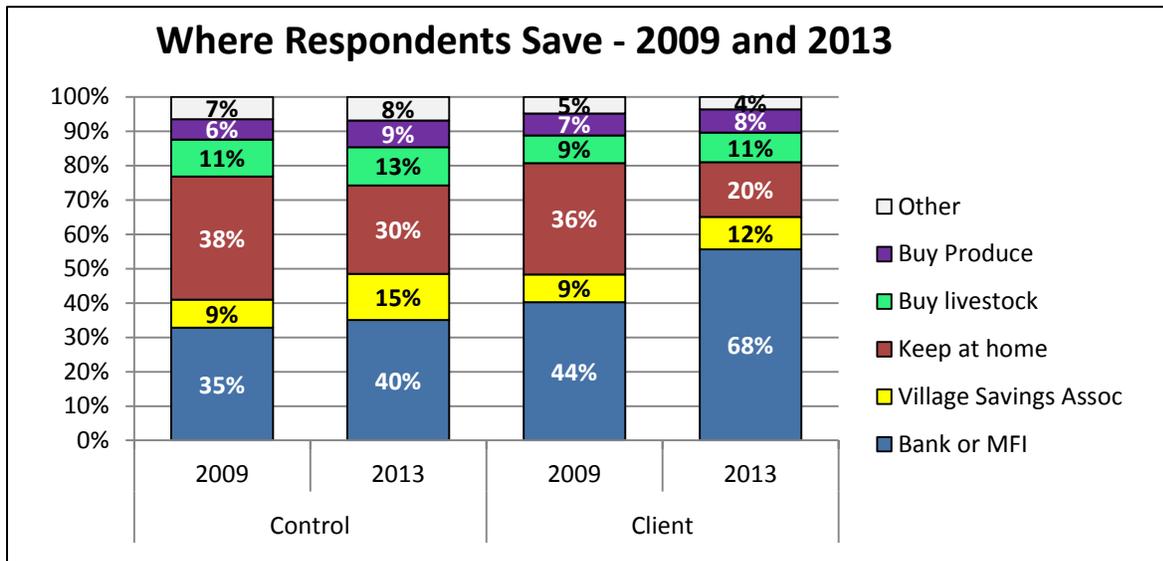


Figure 47. Where Respondents Save - 2009 and 2013



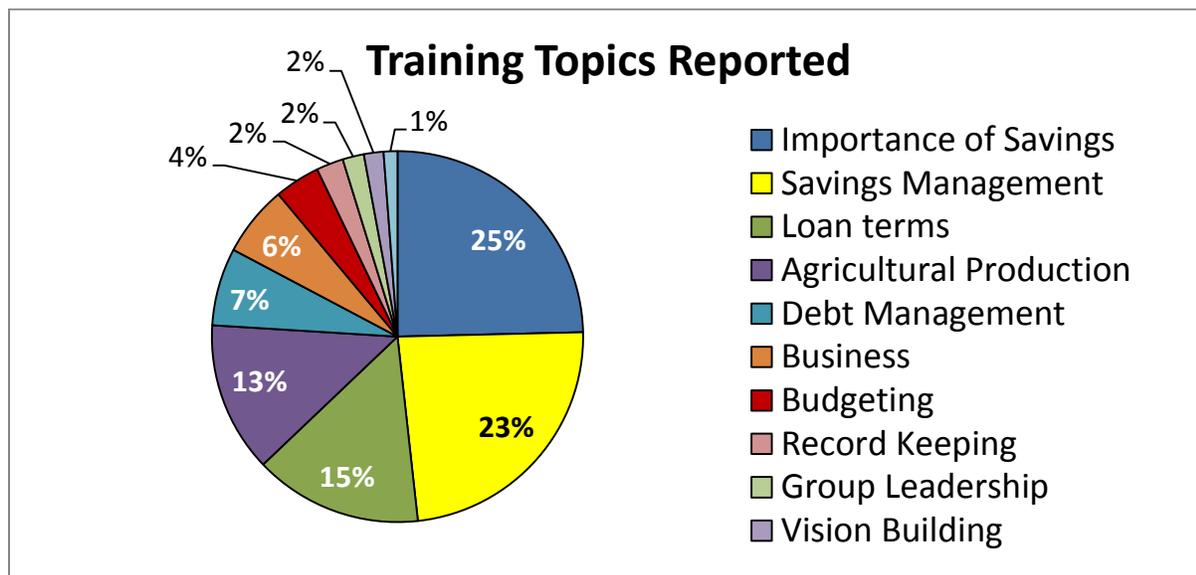
Financial Services	Uganda	Malawi	Ghana	Overall
Clients/country	271	282	320	873
Prop using ATM	22.9%	35.1%	5.0%	20.3%
Prop used Mobile Van Bank	1.1%	12.8%	11.6%	8.7%
Used Agent Based Banking	12.5%	3.2%	30.0%	15.9%
Prop used Mobile Phone Banking	29.2%	6.7%	5.3%	13.2%
Used Crop Insurance	9.2%	32.3%	9.4%	16.7%
Used Other Insurance	19.6%	6.4%	21.3%	15.9%

Table 36. Proportion of Clients Receiving Financial Training by Gender

	Trained	Not Trained	Source of Training					n=
			OI	NGO	MFI	Bank	Other	
Uganda	97.8%	2.2%	96.2%	5.0%	5.0%	5.0%		268
Men	97.5%	2.5%	95.9%	5.2%	4.1%	5.2%		199
Women	98.6%	1.4%	97.1%	4.4%	7.4%	4.4%		69
Malawi	61.9%	38.1%	80.5%	4.6%	5.2%	2.9%	6.9%	281
Men	66.7%	33.3%	85.0%	5.0%	5.7%	2.9%	1.4%	210
Women	47.9%	52.1%	61.8%	2.9%	2.9%	2.9%	29.4%	71
Ghana	91.2%	8.8%	97.3%	4.1%	2.4%	1.7%		319
Men	90.5%	9.5%	97.6%	5.2%	2.4%	1.4%		232
Women	93.1%	6.9%	96.3%	1.2%	2.5%	2.5%		87
Overall	83.8%	16.2%	92.8%	4.5%	4.0%	3.2%	1.4%	868
Men	84.9%	15.1%	93.8%	5.1%	3.9%	3.1%	0.3%	641
Women	80.6%	19.4%	90.2%	2.7%	4.4%	3.3%	4.4%	227
Grand Total	727	141	675	33	29	23	33	868

Observation: While nearly all of the clients have received financial literacy training in Uganda and Ghana, the situation is significantly different in Malawi, where less than 62% of the clients were trained, and the rate is even lower for women at less than 48%. The handing over of loan management responsibility to private sector ESPs in Malawi clearly results in less training for clients.

Figure 48. Training Topics Reported



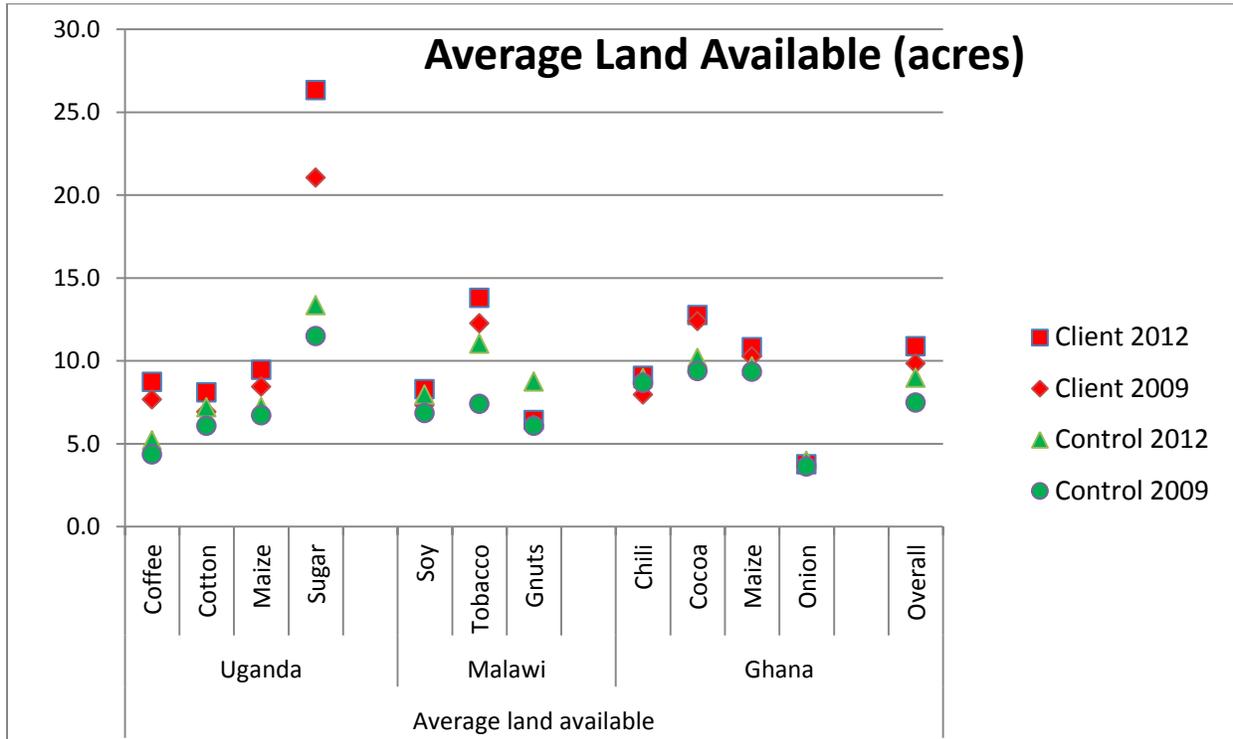
Opportunity has prepared a training video on financial literacy in each of the countries. The survey sought to investigate how many of the respondents had seen the video. Overall, we found that 32% of the clients and 15% of the control farmers had seen the video. The largest proportion (60%) had seen it during a training session by Opportunity, the rest saw it on TV (or showing on the monitors in the bank lobby). The numbers are significantly inflated by the high number of respondents who saw the Ghana video during trainings organized by the bank. See table below. Numbers for Ghana are highlighted in yellow.

Table 37. Training Video

Group	Saw Video	%	Where saw Video			n=
			TV	Training	Other	
Uganda	98	24%	53%	44%	15%	410
Client	82	30%	55%	40%	18%	271
Control	16	12%	44%	63%	0%	139
Malawi	75	18%	52%	13%	41%	421
Client	67	24%	54%	13%	40%	282
Control	8	6%	38%	13%	50%	139
Ghana	159	38%	11%	91%	4%	424
Client	127	40%	12%	90%	5%	320
Control	32	31%	6%	97%	3%	104
Overall	332	26%	33%	60%	16%	1255
Client	276	32%	35%	57%	17%	873
Control	56	15%	21%	75%	9%	382

Annex 7. Land Availability and Utilization

Figure 49. Average Land Available



Observation: Land available is the net total of all owned and rented land. The proportion of this planted to the priority crop varies according to the agricultural system. In Ghana, most of the available land was planted to the priority crop. In Uganda, only a small proportion of the total land is in the priority crop while a large number of other crops are also grown for food security. Overall, clients tended to have more land available in both 2009 and 2013, compared to control farmers, but this is highly skewed by the much larger size of farms under sugar in Uganda. With the exception of groundnuts and onions, the area of land available to the client respondents tended to increase more between 2009 and 2012, compared to control farmers. This implies that they were more likely to either purchase or rent additional land.

Note: Two large individual sugar borrowers have been removed from analysis because they biased the averages significantly. Not all of the land grown in the priority crop is supported by the loan. In Ghana the average cocoa loan covers no more than 4 acres, even though the average under cocoa is 9.5 acres. The maximum limit for group sugar loans is set at 20 acres, although some farmers grow much more sugar than that.

Figure 50. Land Rental Trends by Country

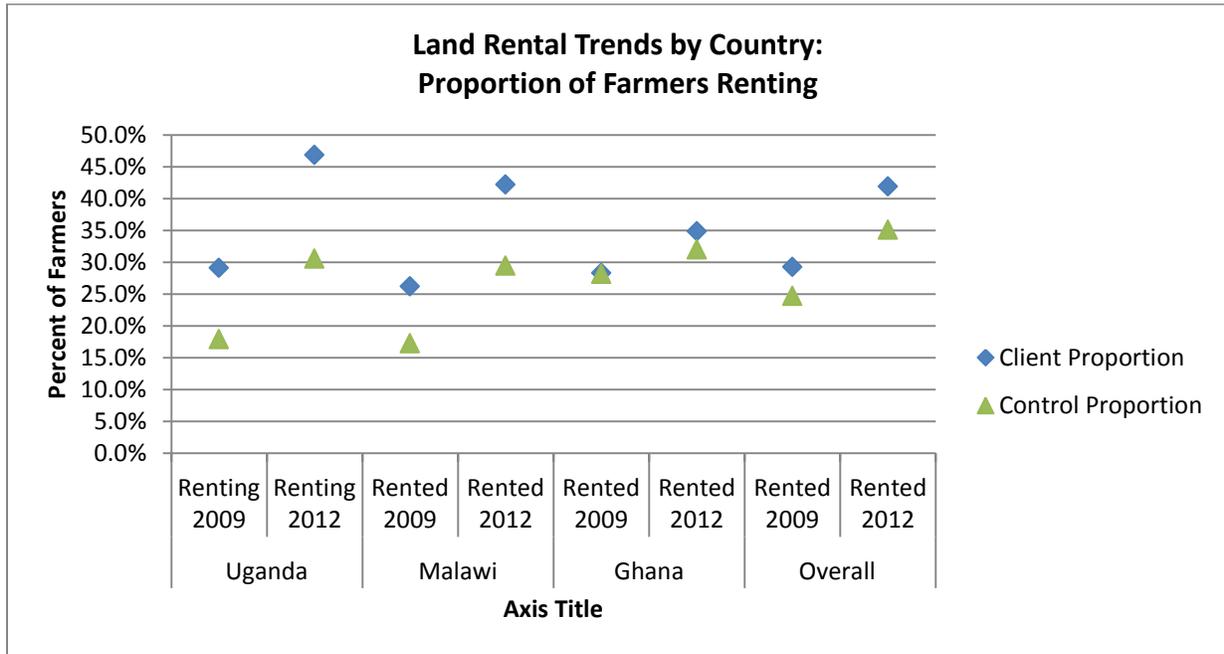
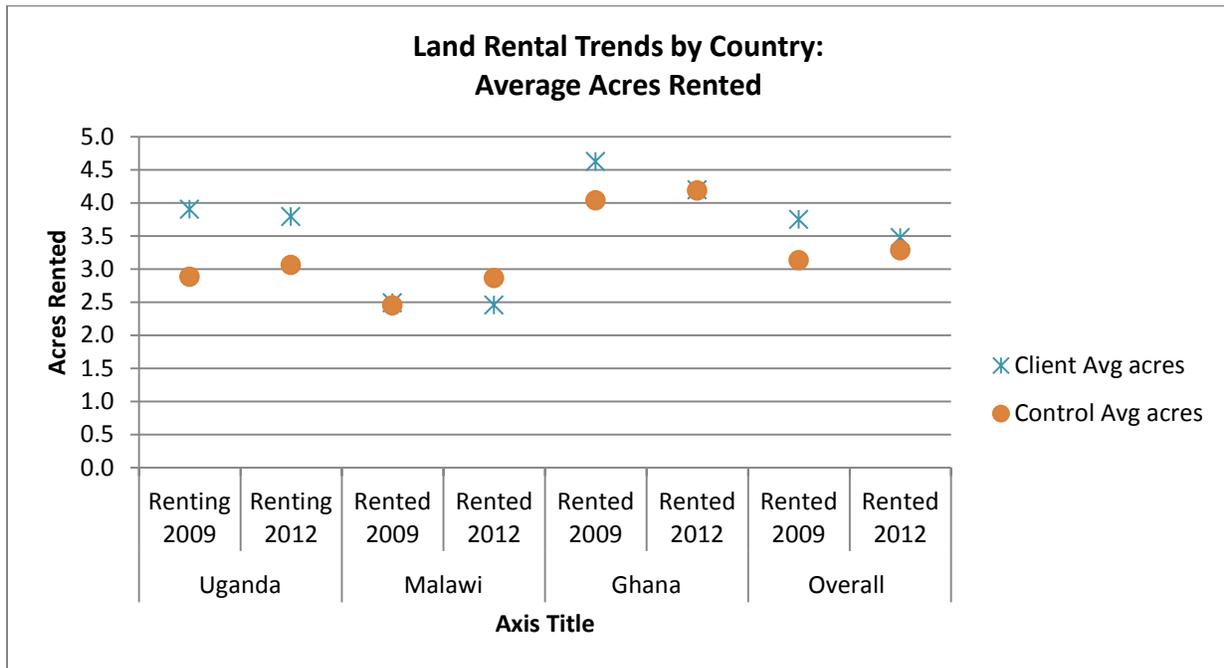


Figure 51. Land Rental Trends by Country - Average Acres Rented



Observation: Whereas there is no discernible trend in the change in average size of land rented from 2009 to 2013, when one compares clients and control, the changes in proportion of the respondents renting land in 2013 is much clearer. In all cases, the increase in the proportion of clients renting land is much higher than the increase for control households. In other words, the loan is significantly encouraging more borrowers to rent land in order to expand their agricultural production, even though

the average size of such rented land is either declining or staying the same. The decline is likely due to the larger influx of new renters.

Unfortunately, the data on land use exhibited a number of problems that negatively affected the analysis. These appear to have been largely the result of enumerator error. It seems when enumerators asked about the area under cultivation, some of them were asking only for crops other than the priority crop for the loan. Thus, the data exhibited many cases where reported area cultivated was less than the area under the priority crop. These cases had to be thrown out of the analysis. It is therefore not possible to assess whether the proportion of cultivated area dedicated to the priority crop has changed as a result of the loan.

Annex 8. Changes in Production Practices.

Table 38. Distribution Of Households Using Selected Production Practices By Country And Status Of Household

Percent of Households Adopting Various Production Practices																
Practice used	Uganda				Malawi				Ghana				Overall			
	2009		2012		2009		2012		2009		2012		2009		2012	
	Control	Client														
Improved seeds	65	60	77	83	73	79	87	99	74	66	76	70	70	68	81	83
Hired labor	66	67	78	82	36	43	49	64	85	87	90	94	60	67	71	81
Fertilizers	13	14	26	42	41	46	49	63	62	69	81	94	36	45	49	68
Pesticides	4	9	31	41	0	1	26	47	28	26	68	71	9	12	39	54
Herbicides	23	19	37	44	0	0	0	1	47	43	63	54	21	22	31	34
Hiring of tractor/oxen	36	22	44	36	0	0	0	1	14	16	14	17	17	13	20	17

Table 39: Percentage Change In Proportions Of Households Using Various Crop Production Practices In 2012 And 2009 By Country And Household Status

Percentage Change in Input Use by Country and Household Status								
Production Practice	Uganda		Malawi		Ghana		Overall	
	Control	Client	Control	Client	Control	Client	Control	Client
Improved seeds	18	38	19	25	3	6	16	22
Hired labor	18	22	36	49	6	8	18	21
Fertilizers	100	200	20	37	31	36	36	51
Pesticides	675	356	26	47	143	173	333	350
Herbicides	61	132	0	1	34	26	48	55
Hiring of tractor/oxen	22	64	0	1	0	6	18	31

Pesticide use in Uganda and herbicide use in Ghana are the only inputs that increased less for clients than for control. Pesticides are largely discouraged in Uganda and are not included as part of the loan package except for cotton. Herbicides are not part of the loan package in Ghana with the exception of maize.

Annex 9. Trends in Crop Yields, Total Production and Quantity Marketed

Table 40: Average Quantities Marketed And Yields Of Target Crops In 2012 And 2009 By Status Of Household

Crop	Quantity produced				%age change in qty produced		Quantity marketed				%age change in qty marketed		Yield				%age change in yield	
	Control		Client		Control	Client	Control		Client		Control	Client	Control		Client		Control	Client
	2009	2012	2009	2012			2009	2012	2009	2012			2009	2012	2009	2012		
Uganda																		
Coffee	1,330	1,255	1,116	1,767	-6	58	1,314	1,240	1,097	1,725	-6	57	716	551	542	779	-23	44
Cotton	635	708	2,095	1,126	11	-46	630	705	2,093	1,108	12	-47	317	312	481	364	-1	-24
Maize	1,912	3,360	3,236	4,185	76	29	1,692	3,112	2,898	3,801	84	31	589	732	909	1,010	24	11
Sugarcane	153,713	168,141	534,536	665,764	9	25	152,666	166,975	526,357	665,371	9	26	39,690	33,632	36,928	46,276	-15	25
Malawi																		
Tobacco	661	690	1,476	2,125	4	44	661	690	1,476	2,125	4	44	393	400	438	614	2	40
Groundnuts	263	373	235	280	42	19	233	330	184	229	41	24	325	380	287	388	17	35
Soybean	377	450	662	520	19	-21	337	405	597	473	20	-21	478	421	488	308	-12	-37
Ghana																		
Cocoa	892	1,016	1,074	1,359	14	26	892	1,016	1,074	1,359	14	26	143	174	148	190	22	29
Maize	6,264	6,472	5,570	7,872	3	41	5,969	6,154	5,265	6,049	3	15	976	1,037	886	1,271	6	44
Onions	5,926	6,969	4,146	5,812	18	40	3,928	6,568	3,906	5,418	67	39	1,419	1,392	1,118	1,453	-2	30
Chilies	1,511	1,473	1,404	1,734	-2	24	1,327	1,314	1,286	1,578	-1	23	410	373	308	316	-9	2

Note: Cells in the columns for percentage change in production, quantity marketed and yield where the clients did better have been highlighted in green, while those where control households performed better have been highlighted in orange. Percentage change is informative, but should be interpreted with caution. When the starting point is very small, a much smaller increase will result in a larger percentage change. For example, in the case of **maize** in Uganda, where the control households were performing so very poorly in 2009, even a large percentage increase in production, quantity marketed and yield does not bring their performance in 2012 even up to the levels at which the client households had reached in 2009. Similarly, for **cotton** in Uganda, while the percentage changes were higher for controls, client levels of production, quantity marketed and yield were all consistently higher for clients. For **groundnuts and soybeans**, however, where the starting point was more comparable, the higher percentage change does reflect the better performance of controls. With respect to **onions**, the anomaly of a very low proportion of production, marketed in 2009 should be noted. This may reflect a particularly bad year in which lots of onions for the control households went unsold due to market failure. We have no concrete explanation for why this might have been. For a more detailed discussion of the factors at play, please see the detailed discussion of the respective crops in section 2.2.3 above.

Table 41. Comparison Between Client, Control without Loans and Controls With Loans

Crop	Quantity Produced in 2012			Quantity Marketed in 2012			Yield in 2012		
	Client	Control with no loan	Control with loan	Client	Control with no loan	Control with loan	Client	Control with no loan	Control with loan
Chilies	1,734.4 (n=48)	1,588.6 (n=11)	1,050 (n=3)	1,578.10	1,381.80	933.30	315.80	426.90	177.40
Cocoa	1,356.4 (n=150)	1,004 (n=37)	1,092.5 (n=6)	1,356.40	1,004.00	1,092.50	190.20	166.60	222.60
Coffee	1,767 (n=64)	1,505.7 (n=18)	754.1 (n=9)	1,724.90	1,482.40	753.90	771.80	536.80	579.10
Cotton	1,126 (n=45)	777.6 (n=18)	373 (n=5)	1,108.20	777.00	359.00	364.10	333.30	236.20
Maize-Uganda	4,184.9 (n=69)	3,886.1 (n=23)	1,847.5 (n=8)	3,800.60	3,605.40	1,693.80	1,002.20	810.90	504.00
Maize-Ghana	7,925 (n=80)	6,734.5 (n=4)	4,575 (n=18)	6,082.00	6,411.70	4,313.00	1,264.80	1,154.60	697.90
Soybeans	519.7 (n=49)	457.3 (n=27)	345 (n=2)	472.90	416.50	250.00	307.50	426.60	345.00
Sugarcane	665,764.3 (n=28)	145,068.2 (n=22)	218,900 (n=10)	665,371.40	218,900.00	217,200.00	46,275.90	34,321.40	34,321.40
Tobacco	2,124.9 (n=125)	705.7 (n=46)	504.5 (n=4)	2,124.90	705.70	504.50	614.20	385.70	559.00

Note: When controls are divided between those with and without loans, the number of cases becomes very small in some crops.

Table 42. Statistical test of significance for Comparisons of Means

t-values between client and control with a loan							
Crop	quantity produced in 2012		quantity marketed in 2012		yield in 2012		
Chilies	3.457	0.002	1.777	0.102	2.641	0.065	
Cocoa	1.03	0.341	-0.331	0.75	-1.844	0.43	
Coffee	2.9	0.006	1.8	0.089	1.5	0.172	
Cotton	3.2	0.003	1.9	0.073	1.4	0.198	
Maize-Uganda	2.2	0.031	2.7	0.012	4.2	0.001	
Maize-Ghana	1.6	0.195	0.872	0.41	4.6	0.001	
Soybeans	1.1	0.279	1.9	0.9	-1.163	0.25	
Sugarcane	2.2	0.038	-1.8	0.081	0.61	0.546	
Tobacco	7	0	1.3	0.234	0.656	0.554	
-values between control without loan and control with loan							
Chilies	2.211	0.47	1.777	0.102	2.522	0.027	
Cocoa	-0.331	0.75	-0.331	0.75	-1.367	0.209	
Coffee	1.8	0.083	1.8	0.089	-0.304	0.766	
Cotton	1.8	0.083	1.9	0.073	1.079	0.313	
Maize-Uganda	2.8	0.008	2.7	0.012	2.2	0.38	
Maize-Ghana	0.862	0.418	0.872	0.41	2.3	0.03	
Soybeans	1.5	0.153	1.9	0.09	2.3	0.026	
Sugarcane	-1.9	0.079	-1.8	0.081	-0.112	0.913	
Tobacco	1.3	0.234	1.3	0.234	-1.98	0.12	

Annex 10. Survey Farmer Explanations for Changes in Crop Yields, Production and Incomes

Table 44: Distribution Of Households Reporting Factors That Influenced Increases In Production

Percent Of Households Reporting Increase In Production By Country And Household Status								
Reason For Increase In Production	Uganda		Malawi		Ghana		Overall	
	Control	Client	Control	Client	Control	Client	Control	Client
Applied fertiliser, better soil fertility management	32	49	48	69	72	82	49	67
Timely weeding, better weed management	62	57	41	52	49	50	51	53
Timely planting	52	51	70	65	38	37	54	50
Cultivated large garden	49	59	51	51	15	36	40	48
Better weather	56	51	58	58	37	36	51	48
Better pest/ disease control	24	37	30	47	49	57	34	48
Increased use of improved variety	34	34	31	54	47	51	37	47
Use of fertile land, planted after fallow on the virgin land	43	37	32	37	31	44	36	40
Planting in line, better spacing	29	29	30	34	28	40	29	35
Timely harvesting, improved post harvest handling	14	16	24	32	15	26	18	25
Variety tolerant to drought, erratic weather pattern	10	12	15	24	14	22	12	20

Table 45: Distribution Of Households Reporting Factors That Influenced Decreases In Production

Percent Of Households Reporting Decreased Production By Country And Status								
Reason For Decrease In Production	Uganda		Malawi		Ghana		Overall	
	Control	Client	Control	Client	Control	Client	Control	Client
Drought	53	45	63	42	57	70	57	54
Late planting	18	28	32	73	25	27	25	42
increased crop pests or diseases infestation	53	26	47	31	57	53	52	38
Declining soil fertility/ soil not fertile	61	39	24	15	39	37	42	31
Did not use fertiliser, not available, too expensive	40	21	67	25	57	28	54	25
Poor variety	16	29	53	26	29	22	32	25
Cultivated small garden	34	23	35	29	32	19	34	23
Poor emergence, spacing, plant population	16	21	21	26	32	28	22	25
Not weeded/ weeded late	21	23	21	10	25	17	22	17
Too much rain, poor drainage/ flooding in gardens/ land is swampy	21	32	12	18	25	25	19	25
Increased soil erosion/ run off	13	7	15	10	25	23	17	14
Harvested late, post harvest losses	8	15	15	15	21	18	14	16
Thieves	11	8	12	12	21	18	14	13
Increased problems with wild animals/ vermin domestic animals	13	5	9	7	25	22	15	12

Annex 11. Alternative Data and Farmer Records Addressing Changes in Crop Yields, Production and Incomes

Table 46. Kasambya Farmer Society, Masaka, Uganda (Coffee)

Kasambya Farmer Society, Masaka, Uganda (Coffee)															
				2011 (No loan effect)						2012 (Effect of loan issued in Oct 2011)†					
	Farmer Name	Gender	Loan Taken in 2012†	Land size (acres)	Output Marketed through Coop Society (kgs)	Output Side Sold (kgs)	Total Production (kgs)	Yields (kgs per Acre)	Sale Price (UGX/kg)	Land size (acres)	Output Marketed through Coop Society (kgs)	Output Side Sold (kgs)	Total Production (kgs)	Yields (Kgs per Acre)	Sale Price (UGX/kg)
1	Farmer 1	M	Yes	2	0	105	105	53	4500	2	152	120	272	136	4500
2	Farmer 2	M	Yes	2	0	900	900	450	2500	2	757	400	1157	579	2000
3	Farmer 3	F	Yes	2	0	150	150	75	2500	2	289	51	340	170	5000
4	Farmer 4	M	Yes	4	0	350	350	88	2500	4	309	500	809	202	4500
5	Farmer 5	F	Yes	1	0	8	8	8	2500	2	129	0	129	65	4500
6	Farmer 6	M	Yes	1.5	0	600	600	400	2500	1.5	334	216	550	367	4500
7	Farmer 7	M	Yes	1	0	600	600	600	3000	1	242	300	542	542	4600
8	Farmer 8	M	Yes	2	0	500	500	250	4000	2	207	300	507	254	4500
9	Farmer 9	M	Yes	4	0	2500	2500	625	3800	4	349	2225	2574	644	4800
10	Farmer 10	M	No	1	0	36	36	36	1850	1	28	400	428	428	4700
11	Farmer 11	M	No	10	0	3000	3000	300	5000	10	165	6000	6165	617	4500

Observations:

1. The results reported by the group are consistent with the overall market trend of lower yields in 2012 due to the harsh climatic conditions.
2. For the four farmers who got loans and reported yield increases, saw an average increase of 11%.
3. Two farmers who got loans saw a decrease of 9% in the yield. The remaining two farmers did not see any change in yield.
4. The key impact that the loan made was not on higher yields, but the proactive approach Opportunity loan officers in Masaka have taken to encourage farmer groups to process the dry cherry in to hulled coffee beans, and sell at a much higher price, 4500 to 5000 Ugandan Shillings per UGX for hulled coffee versus 2000 to 3000 UGX per kilogram for dry cherry. The capability that the farmer groups are building to process and market in bulk are providing groups which process a higher return.
5. Repeat cycles of fertilizers will allow better conversion to hulled beans from the current rate of 45-50% to 65-70% that will result in larger margins.

Table 47. Elayi Aseka Farmer Society, Masaka, Uganda (Coffee)

Elayi Aseka Farmer Society, Masaka, Uganda (Coffee)																			
			2010 (No loan effect)						2011 (No loan effect)						2012 (Effect of loan issued in Oct 2011)				
Farmer Name	Loan Taken in 2012	Land size (acres)	Output Marketed through Coop Society (kgs)	Output Side Sold (kgs)	Total Production (kgs)	Yield per Acre	Sale Price (UGX/kg)	Land size (acres)	Output Marketed through Coop Society (kgs)	Output Side Sold (kgs)	Total Production (kgs)	Yield per Acre	Sale Price (UGX/kg)	Land size (acres)	Output Marketed through Coop Society (kgs)	Output Side Sold (kgs)	Total Production (kgs)	Yield per Acre	Sale Price (UGX/kg)
1 Farmer 1	Yes	6	200	1000	1200	200		6	500	1500	2000	333	2000	6	626	1000	1626	271	2000
2 Farmer 2	Yes	3	100	0	100	33		3	489	200	689	230	2000	3	498	200	698	233	2000
3 Farmer 3	Yes	6	300	500	800	133		6	700	1500	2200	367	2000	6	2058	1000	3058	510	2000
4 Farmer 4	Yes	3	200	0	200	67		3	300	0	300	100	2000	3	219	0	219	73	3350
5 Farmer 5	Yes	2	150	200	350	175		2	175	300	475	238	2000	2	179	400	579	290	1800
6 Farmer 6	Yes	3	0	450	450	150		3	0	450	450	150	1800	3	53	300	353	118	1800
7 Farmer 7	Yes	8	0	1800	1800	225		8	0	2200	2200	275	2000	11	400	3200	3600	327	2300
8 Farmer 8	Yes	0.5	70	80	150	300		0.5	42	50	92	184	2000	1	61	30	91	91	2200
9 Farmer 9	Yes	1.5	100	100	200	133		1.5	200	100	300	200	2000	1.5	229	150	379	253	2000
10 Farmer 10	Yes	1	150	300	450	450		1.5	200	400	600	400	2000	2	74	500	574	287	2000

Observations:

1. All farmers in the table took loans.
2. At least two of the farmers cited pests as the reason for lower output.
3. One farmer mentioned hot weather and pests combined as the cause of low season output.
4. In 2012, 4 of 10 farmers reported higher yields over 2011, 1 experience no change, while 5 saw yields decline. In 2011, 7 farmers reported a yield increase, 1 reported no change, and 2 reported a decline. The results are consistent with farmer claims that 2011 proved a better production season than 2012.
5. In 2012, the 5 farmers who reported yield increases, averaged a 27% rise. The 5 who reported a decrease experienced a 29% decrease.
6. In 2011, the 7 farmers who saw yield increases, experienced a 141% average rise. Two saw yields fall in 2011 by 25% on average.
7. The farmer who had a nearly 3-fold increase between 2010 and 2011, from 800 Kilograms to 2200 kilograms from an acre of land, reported using fertilizer to achieve the increase.
8. The evidence shows that while the use of fertilizer is proven to be effective in increasing yields substantially, external factor negatively impacted production in the loan season ending in May 2012.
9. This table does not provide any comparisons with non-clients. However, it shows the lower prices garnered by un-processed coffee (dry cherry). Opportunity is working to facilitate processing for better prices for the farmers.
10. Three farmers increased land holding in 2012 by 33% to 100% compared to only one farmer in 2011. This data and anecdotal evidence suggests that farmers with loans gathered sufficient capital to acquire the land. It costs about USD 600 to acquire an acre of land.

Table 48. Rwibaale Tweimukye Group, Kyenjojo, Uganda, (Maize Shelled)

Rwibaale Tweimukye Group, Kyenjojo, Uganda (Maize Seed Shelled)																					
Farmer Name	Gender	Crops Grown	Inter-cropped**	Loan Taken in 2012 (Winter Season) †	Loan Taken in 2012 (Summer Season) †	2010 (No loan effect)					2011 (No loan effect)					2012 † (Effect of loan/s)					
						Land size (acres)	Total Maize Output Produced (bags*)	Maize Output Consumed (bags*)	Yield per Acre	Sale Price (UGX/Kg)	Land size (acres)	Total Maize Output Produced (bags*)	Maize Output Consumed (bags*)	Yield per Acre	Sale Price (UGX/Kg)	Land size (acres)	Total Maize Output Produced (bags*)	Maize Output Consumed †† (bags*)	Yield per Acre	Sale Price (UGS/Kg)	
1 Farmer1	M	Maize, Irish, Beans, Coffee, Banana	No	Yes	No	1	20	2	20	400	1	25	2	25	400	1.5	35	2	23	500	
2 Farmer2	M	Maize, Irish, Coffee	No	No	Yes	1	18	3	18	400	1.5	30	2	20	400	1	20	5	20	700	
3 Farmer3	M	Maize	No	Yes	Yes	2	25	5	13	300	4	80	3	20	400	3	60	3	20	500	
4 Farmer4	M	Maize, Irish	No	Yes	Yes	0.5	4	1	8	300	1	8	2	8	300	1	12	2	12	400	
5 Farmer5	F	Coffee, Banana, Irish, Maize	No	No	Yes	0.5	7	1	14	300	1	10	2	10	450	1	15	2	15	500	
6 Farmer6	F	Irish, Maize	No	Yes	Yes	0.5	5	2	10	400	1.5	15	2	10	500	1	12	3	12	600	
7 Farmer7	F	Maize, Beans	No	Yes	Yes	1	12	2	12	400	0.5	7	1	14	500	1	15	2	15	500	
8 Farmer8	M	Maize, Beans, Irish	No	Yes	Yes	1	15	1	15	400	1.5	30	3	20	500	2	40	5	20	500	
9 Farmer9		Maize, Beans	No	Yes	Yes	0.5	5	0	10	400	0.5	4	0	8	500	0.5	5	1	10	500	
10 Farmer10	M	Maize, Beans	Yes	No	Yes	0.5 (with beans)	6	6	12	400	1 (not intercropped)	16	16	16	500	1 (with beans)	15	0	15	400	

Observations

- All farmers in the group got a loan either for the winter crop, or for the summer crop or both in 2012.
- Only one farmer intercropped maize with beans while the remaining dedicated the land only to Maize.
- Of the eight of 10 farmers who got a loan in the summer (#2,3,4,6,5,7,8,9), 5 increased their yield by an average 30% while 3 farmers maintained it at a constant level. None among the eight experienced a decrease in the yield. The average change in yield for the eight farmers was 19%.
- Of the same eight farmers, 2 had experience a decrease in the yield in the 2011 summer crop season, it remained constant for 2, and it increased for 4. The average change in yield for the seven farmers was 9%, 10% less than for farmers who got loans in 2012.
- Of the eight farmers, 5 got loans for 1 acre of land, 1 for 0.5 acres, 1 for 2 acres and 1 for 3 acres, based on their expected ability to repay.
- Of the eight farmers, 5 increased consumption of the produce at home, and for three it remained constant. 3 of the eight had reduced consumption in 2011, when they did not use a loan, while one had consumed none at home. This provides clear evidence of an improvement in access to food for home consumption because of the loan.

Table 49. Kyaboyagara Group, Kyenjojo, Uganda (Maize Shelled)

Kyaboyagara Group, Kyenjojo, Uganda (Maize Shelled)																			
Farmer Name	Gender	Crops Grown	Inter-cropped**	Loan Taken in 2012 (Summer/September)	2010 (No loan effect)					2011 (No loan effect)					2012 (Effect of loan/s)				
					Land size (acres)	Total Maize Output Produced (bags*)	Maize Output Consumed (bags*)	Yield per Acre	Sale Price (UGX/Kg)	Land size (acres)	Total Maize Output Produced (bags*)	Maize Output Consumed (bags*)	Yield per Acre	Sale Price (UGX/Kg)	Land size (acres)	Total Maize Output Produced (bags*)	Maize Output Consumed (bags*)	Yield per Acre	Sale Price (UGX/Kg)
1 Farmer 1	F	Maize, Beans	No	Yes	0.25	1	0	4	700	0.25	1	0	4	700	0.25	2.2	0.2	9	500
2 Farmer 2 (Using chemical fertilizers since before loan taken/Plants early and gets a better price)	M	Banana, Maize, Irish	No	Yes	<0.25	3	1	400-500		0.5	10	2	20	400	1.5	25	2	17	550
3 Farmer 3	F	Maize, Beans, Ground Nuts	No	Yes	1	4		4	400	0.5	4.5		9	450	0.5	4		8	400
4 Farmer 4	F	Maize, Beans, Ground Nuts	No	Yes	1	10	2	10	350	2	16	2	8	400	3	20	2	7	500
5 Farmer 5	F	Maize, Potatoes	No	Yes	0.1	0	0	N/A	N/A	1	2.5		3	450	0.5	2		4	400
6 Farmer 6	F	Maize, Potatoes	No	Yes	0.5	3	1	6	500	0.5	6	2	12	500	1.5	16	2	11	500
7 Farmer 7	M	Maize, Vegetables, Irish	No	Yes	0 (all Irish)	0	0	N/A	NA	1 (inter-cropped with veggies)	4		4	500	2	10		5	400
8 Farmer 8	F	Beans, Maize, Ground Nuts	No	No	0.25	3	1	12	350	1	8	3	8	400	0.5	4		8	500
9 Farmer 9	M	Maize, Beans, Ground Nuts	Yes	No	0	0	0	N/A	0	0	0	0	N/A	0	0.25	1.5	0.5	6	500
10 Farmer 10	M	Maize, Beans	Yes	No	0.5	3.5	1.5	7	350	0.5	1.5	1.5	3	N/A	0.25	3	1	12	400
11 Farmer 11	F	Maize, Beans	Yes	No	0	0	0	N/A	0	0.25	1.5	0.5	6	400	0.25	2.5	0.5	10	500

Observations:

- The sale price of a bag of maize averaged UGX 464 for farmers who got loans, and averaged UGX 467 for farmers who did not. This shows that both clients and non-clients had equal access to the market.
- Three of the 4 farmers who did not take loans, intercropped. None of the farmers who took loans intercropped.
- Of the 7 farmers who received loans, yields for 4 decreased, but 4 of those 4 farmers increased their land acreage, while 1 did not change the area cultivated. The data suggests therefore that the loan incentivized diverting capital to increase area cultivated for maize, and inadvertently negatively affected yields.
- The remaining 3 of the 7 who got loans saw a yield increase. Two of them reduced cultivated area, while 1 did not change it.
- Those who received loans cultivated an average of 1.32 acres of land, while those who did not, cultivated an average 0.31 acres. This provides additional evidence that having access to loans incentivized increasing land cultivated. The farmers with smaller land holding achieved high yields, which means that they had access to fertilizer outside the loan, and were allocating a small portion of the land for cultivating maize—primarily for household consumption. It is common that farmers who grow maize for non-commercial purposes, distribute the surplus maize among extended family members. During the loan appraisal process, loan officers interview the groups to determine which farmers grow for commercial. Those who do not have commercial intentions do not qualify for the loan.

Table 50. Chicondi Clubs, Kasungu, Malawi (Coffee)

Kasungu Tobacco Loan Season (Oct-May)																									
2009/2010									2010/2011									2011/2012							
Farmer Name	Loan Taken?	Land Planted (acres)	Total Tobacco Output (kgs)	Yield (kgs per acre)	Fertilizer Applied (bags)	Fertilizer bags per Acre†	Fertilizer bags provided with loan	Ave. Sale Price (USD/kg)	Loan Taken?	Land Planted (acres)	Total Tobacco Output (kgs)	Yield (kgs per acre)	Fertilizer Applied (bags)	Fertilizer bags per Acre†	Fertilizer bags provided with loan	Ave. Sale Price (USD/kg)	Loan Taken?	Land Planted (acres)	Total Tobacco Output (kgs)	Yield (kgs per acre)	Fertilizer Applied (bags)	Fertilizer bags per Acre†	Fertilizer bags provided with loan	Ave. Sale Price (USD/kg)	
1 Farmer1	No	4	1100	275	8	2.0		1.90	No	6	1200	200	9	1.5		1.70	Yes	4	1400	350	12	3.0			2.00
2 Farmer2									No	1	700	700	4	4.0		2.40	Yes	2.5	1500	607	10	4.0			2.10
3 Farmer3	Yes	1	1200	1200	7	7.0		1.40	No	1	900	900	6	6.0		1.60	Yes	1	1000	1000	6	6.0			2.20
4 Farmer4	No	5	3100	620	35	7.0		1.80	No	10	4100	410	40	4.0		0.80	Yes	6	3500	583	36	6.0	24		2.40
5 Farmer5	No	2	1000	500	10	5.0		1.20	Yes	2	1000	500	12	6.0		1.20	Yes	5	1500	300	12	2.4			1.50
6 Farmer6	No	1	600	600	6	6.0		2.10	Yes	1	900	900	7	7.0		1.80	Yes	2.5	1100	445	12	4.9			2.20
7 Farmer7	Yes	2.5	1400	567	12	4.9		0.90	No	1	800	800	5	5.0		0.90	Yes	2.5	1790	724	12	4.9	6		1.60
8 Farmer8	No	1	800	800	6	6.0			No	1	900	900	7	7.0			Yes	1.5	1500	1000	15	10.0			1.55
9 Farmer9	No	1	400	400	3	3.0		0.85	Yes	5	2400	480	20	4.0	15	1.60	Yes	5	1400	280	20	4.0	10		1.50
10 Farmer10	No	1	800	800	5	4.5		2.10	Yes	1	975	975	5	5.0		1.95	Yes	2	1075	538	8	4.0	7		2.35
11 Farmer11	No	2.5	1400	560	12	4.8		1.90	No	2	1400	700	16	8.0		1.70	Yes	4.9	1600	324	18	3.6	13		2.10
12 Farmer12	No	2.5	900	360	6	2.4	all	1.15	Yes	1.5	1100	733	9	6.0	all	1.05	Yes	1.5	900	600	6	4.0	all		1.15
13 Farmer13	No	1	700	700	6	6.0		1.60	Yes	2.5	1200	486	10	4.0	all	0.88	Yes	1.2	1700	1376	15	12.1	all		2.05
14 Farmer14	No	10	11000	1100	60	6.0		2.50	No	10	9800	980	55	5.5		1.70	Yes	10	10000	1000	55	5.5	24		2.10
15 Farmer15	No	1	790	790	6	6.0		1.58	No	1	440	440	6	6.0		1.68	Yes	2.5	1400	567	12	4.9	all		1.93
16 Farmer16	Yes	4	2000	500	16	4.0		1.60	Yes	6	3200	533	12	2.0		2.40	No	5	2200	440	22	4.4			1.30
17 Farmer17									No	5	2600	520	21	4.2		0.75	No	4	1500	375	15	3.8			1.65
18 Farmer18	Yes	3	1700	567	11	3.7	10	1.50	No	1.5	1100	733	8	5.0		1.30	No	2	1500	750	10	5.0			1.85
19 Farmer19									No	2	800	400	6	3.0		1.55	No	2.5	900	360	6	2.4			0.55
20 Farmer20	Yes	3.5	1380	394	12	3.4	all	2.00	Yes	3.5	1450	414	16	4.6	all	2.40	No	3.5	1200	343	12	3.4			2.00
21 Farmer21	No	19	6000	316	39	2.1		2.00	No	11	5000	455	25	2.3		1.80	No	19	6000	316	39	2.1			2.00
22 Farmer22	Yes	4.9	1200	243	10	2.0		1.00	Yes	4.9	1000	202	10	2.0		0.60	No	7.4	1500	202	12	1.6	all		0.80
23 Farmer23	No	2	1500	750	18	9.0		2.80	No	4	3000	750	20	5.0		1.80	No	6	3500	583	28	4.7			1.10
24 Farmer24	Yes	3	1000	333	12	4.0		1.10	No	1.5	1500	1000	5	3.3		2.00	No	1	800	800	4	4.0			1.50
25 Farmer25	No	1	700	700	5	5.0		2.80	(No)								No	0.5	275	550	2	4.0			1.50
26 Farmer26	No	1	200	200	1.25	1.3		1.10	No	1	200	200	1.25	1.3		1.40	No	1	200	200	1.5	1.5			1.85
27 Farmer27	No	0.5	200	400	1.5	3.0		2.43	No	1	400	400	3			0.30	(No)								
28 Farmer28	No	1.5	380	253	4	2.7		1.65	No	2	400	200	4	2.0		2.00	No	3	600	200	5	1.7			2.30

Fertilizer bags per acre = increase from the previous year 0.4
 = decrease from the previous year 0.4

† Hectare converted to acre

Observations:

1. In the 2012 crop season fifteen farmers took out loans whereas eleven did not. The yields for the eleven farmers saw an increase of five percent, whereas the non-loan farmers experience a contraction in yields by 13% on the average.
2. In 2011, a larger proportion of farmers did not take out loans; 9 farmers took out loans versus 15 who did not. The five loan clients experienced a jump in yield of 18 percent against an increase in yield of 6% for non –loan farmers.
3. **For Loan Clients:** There is a positive correlation between fertilizer use and yields, and a negative correlation between fertilizer usage and land size cultivated.
 - a. In 2012, clients who increased fertilizer usage, did so by 98%. Their tobacco yields rose by 78%, and land cultivated decreased by 18%.
 - b. In 2012, clients who decreased fertilizer usage, did so by 36%. Their tobacco yields decreased by 30%, and land cultivated increased by 115%.
 - c. In 2011, clients who increased fertilizer usage, did so by 51%. Their tobacco yields rose by 36%%, and land cultivated increased by 76%%.
 - d. In 2011, clients who decreased fertilizer usage, did so by 41%. Their tobacco yields decreased by 12%, and land cultivated increased by 99%.

These results clearly show that the loan capital was effectively applied by loan clients toward either increasing yields or land size. Where lower fertilizer was applied, meant that capital was channelized to increase acreage (buying extra seed, inputs, land or renting land)

4. **For non-Loan Clients:** The results are mixed.
 - a. In 2012, non-clients who increased fertilizer usage, increased it by 40%. Their tobacco yields decreased by 9%, and land cultivated decreased by 4%.
 - b. In 2012, non-clients who decreased fertilizer usage, decreased it by 22%. Their tobacco yields decreased by 14%, and land cultivated increased by 13%.
 - c. In 2011, clients who increased fertilizer usage, increased it by 42%. Their tobacco yields rose by 19%, and land cultivated decreased by 10%.
 - d. In 2011, clients who decreased fertilizer usage, decreased it by 18%. Their tobacco yields increased by 25%, and land cultivated increased by 22%.

In 2012, yields decreased for non-client farmers, more for those who decreased fertilizer usage. Non-client farmers preferred to increase land size. In 2011, the yields rose across the board, however farmers who increased fertilizer usage decreased land size. Those who decreased fertilizer usage also saw an increase in yields, which means that the quantity of fertilizer applied among the non-client segment was insufficient for the area of land cultivated.

Annex 12. Explanation of the Interpretation of the PPI

The formulated questions and scores that make up the PPI for each country, and the tables used for their interpretation are provided below by country.

Table 51. PPI questions for Uganda:

Uganda	Responses	Score
1. How many members does the household have?	A. Six or more	0
	B. Four or five	6
	C. Three	9
	D. Two	14
	E. One	27
2. Do all children ages 6 to 18 currently attend school (government, private, NGO/religious, or boarding)?	A. Not all attend	0
	B. All attend government schools	2
	C. No children ages 6 to 18	4
	D. All attend, and one or more attend a private, NGO/religious, or boarding school	5
3. What is the highest grade that the female head/spouse completed?	A. No female head/spouse	0
	B. P.5 or less, or none	2
	C. P.6	6
	D. P.7 to S.6	8
	E. Higher than S.6	19
4. What is the major construction material of the roof?	A. Thatch, straw, or other	0
	B. Iron sheets, or tiles	5
5. What is the major construction material of the external wall?	A. Un-burnt bricks, mud and poles, thatch/straw, timber, stone, burnt bricks with mud, other	0
	B. Burnt bricks with cement, or cement blocks	2
6. What is the main source of lighting in your dwelling?	A. Firewood	0
	B. Tadooba, or other	11
	C. Paraffin lantern, or electricity (grid, generator, solar)	17
7. What is the type of toilet that is mainly used in your household?	A. Bush (none)	0
	B. Covered pit latrine (private or shared), VIP latrine (private or shared), uncovered pit latrine, flush toilet (private or shared), or other	4
8. Does any member of your household own electronic equipment (e.g., TV, radio, cassette, etc.) at present?	A. No	0
	B. Yes	7
9. Does every member of the household have at least two sets of clothes?	A. No	0
	B. Yes	5
10. Does every member of the household have at least one pair of shoes?	A. No	0
	B. Yes	9

Table 52. PPI questions for Malawi:

Malawi	Responses	Score
1. How many household members are 14-years-old or younger?	A. Five or more	0
	B. Four	4
	C. Three	6
	D. Two	12
	E. One	19
	F. None	30
2. How many household members worked in their main activity in the past seven days as a farmer (mlimi)?	A. Four or more	0
	B. Three	2
	C. Two	7
	D. One	8
	E. None	10
3. Can the female head/spouse read a one-page letter in any language?	A. No	0
	B. Yes	5
	C. No female head/spouse	9
4. The roof of the main dwelling is predominantly made of what material?	A. Grass	0
	B. Anything besides grass	4
5. What is your main source of cooking fuel?	A. Collected firewood from forest reserve, crop residue, sawdust, animal waste, or other	0
	B. Collected firewood from unfarmed areas of community	1
	C. Collected firewood from own woodlot, community woodlot, or other places	5
	D. Purchased firewood	7
	E. Paraffin, charcoal, gas, or electricity	9
6. What is your main source of lighting fuel?	A. Collected firewood, grass, or other	0
	B. Paraffin	4
	C. Purchased firewood, electricity, gas, battery/dry cell (torch), or candles	13
7. Does the household own any lanterns (paraffin) ?	A. No	0
	B. Yes	5
8. Does the household own any bicycles, motorcycles/ scooters, cars, mini-buses, or lorries?	A. No	0
	B. Yes	5
9. Does the household own any irons (for pressing clothes)?	A. No	0
	B. Yes	8
10. How many sickles does the household own?	A. None	0
	B. One	3
	C. Two or more	7

Table 53. PPI questions for Ghana:

Ghana	Responses	Score
1. How many members does the household have?	A. Seven or more	0
	B. Six	6
	C. Five	8
	D. Four	11
	E. Three	15
	F. Two	23
	G. One	31
2. Are all children ages 5 to 12 in school?	A. No	0
	B. Yes, or no children ages 5 to 12	4
3. What is the highest grade completed by the female head/spouse?	A. No female head/spouse	0
	B. None or pre-school	4
	C. Primary or middle	7
	D. Any JSS, SSS, S, L, U, or higher	10
4. Is the main job of the male head/spouse in agriculture?	A. Male head/spouse has no job	0
	B. Yes, main job is in agriculture	8
	C. No, main job is not in agriculture	10
	D. No male head/spouse	10
5. What is the main construction material used for the roof?	A. Palm leaves/raffia/thatch, wood, mud bricks/earth, bamboo, or other	0
	B. Corrugated iron sheets, cement/concrete, asbestos/slate, or roofing tiles	3
6. What is the main source of lighting for the dwelling?	A. Not electricity (mains)	0
	B. Electricity (mains)	5
7. What is the main source of drinking water for the household?	A. Borehole, well (with pump or not, protected or not), or other	0
	B. River/stream, rain water/spring, or dugout/pond/lake/dam	5
	C. Indoor plumbing, inside standpipe, sachet/bottled water, standpipe/ tap (public or private outside), pipe in neighbors, water truck/tanker, or water vendor	7
8. Does any household member own a working stove (kerosene, electric, or gas)?	A. No	0
	B. Yes	10
9. Does any household member own a working iron (box or electric)?	A. No	0
	B. Yes	6
10. Does any household member own a working radio, radio cassette, record player, or 3-in-1 radio system?	A. None	0
	B. Only radio	2
	C. Radio cassette but no record player nor 3-in-1 (regardless of radio)	6
	D. Record player but no 3-in-1 (regardless of radio or cassette)	9
	E. 3-in-1 radio system (regardless of any others)	14

The lookup tables for interpretation of the PPI scores for each of the three countries are presented below.

Uganda PPI[®]: Look-up Tables

Use the following look-up tables convert PPI scores to the poverty likelihoods below each of the poverty lines.

PPI Score	Food (%)	National (%)	150% National (%)	200% National (%)	USAID 'Extreme' (%)
0-4	87.6	94.2	100.0	100.0	78.9
5-9	82.0	90.5	100.0	100.0	70.9
10-14	62.7	87.4	100.0	100.0	47.7
15-19	51.6	74.0	97.9	98.8	45.3
20-24	35.5	65.1	86.1	95.8	31.9
25-29	25.0	47.9	73.7	90.2	24.9
30-34	11.3	38.1	69.9	85.7	13.7
35-39	12.0	27.3	64.8	85.2	13.4
40-44	4.3	15.1	47.2	73.0	4.2
45-49	4.0	10.7	41.1	66.8	3.9
50-54	1.8	6.7	34.6	57.1	0.5
55-59	0.7	2.9	18.3	41.6	0.9
60-64	0.2	0.8	17.5	33.5	0.0
65-69	0.0	0.5	6.2	18.8	0.0
70-74	0.0	0.7	6.0	13.5	0.0
75-79	0.0	0.0	1.8	2.9	0.0
80-84	0.0	0.0	0.0	3.9	0.0
85-89	0.0	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0	0.0

Source: *Progress out of Poverty Index[®]: A Simple Poverty Scorecard for Uganda*, by Mark Schreiner.

This PPI was created in September 2011 based on data from 2009/10. For more information about the PPI, please visit www.progressoutofpoverty.org.

Uganda PPI[®]: Look-up Tables

Use the following look-up tables convert PPI scores to the poverty likelihoods below each of the poverty lines.

PPI Score	\$1.25 Intl 2005 PPP (%)	\$2.50 Intl 2005 PPP (%)	Sulaiman \$1.25/day (%)
0-4	100.0	100.0	97.1
5-9	92.1	100.0	89.5
10-14	100.0	100.0	78.9
15-19	92.3	98.8	58.4
20-24	82.6	100.0	55.3
25-29	67.0	95.5	38.1
30-34	61.8	94.8	29.2
35-39	55.3	93.0	16.7
40-44	38.0	86.5	13.3
45-49	31.3	83.7	6.3
50-54	24.6	78.1	5.4
55-59	11.3	61.5	3.1
60-64	6.2	47.4	0.0
65-69	2.5	32.1	0.0
70-74	2.8	14.3	0.0
75-79	0.0	9.3	0.0
80-84	0.0	5.7	0.0
85-89	0.0	0.0	0.0
90-94	0.0	0.0	0.0
95-100	0.0	0.0	0.0

Source: *Progress out of Poverty Index[®]: A Simple Poverty Scorecard for Uganda*, by Mark Schreiner.

Malawi PPI[®]: Lookup Tables

Use the following look-up tables to convert PPI scores to the poverty likelihoods below each of the poverty lines.

PPI Score	National (%)	Food (%)	USAID 'Extreme' (%)	1993 PPP \$1.08/day (%)	1993 PPP \$2.16/day (%)
0-4	100.0	78.8	78.8	78.8	100.0
5-9	95.2	60.2	60.2	67.0	100.0
10-14	95.5	63.9	70.9	71.9	97.8
15-19	88.9	60.2	65.5	68.3	96.7
20-24	82.5	40.8	48.7	49.9	94.3
25-29	70.0	30.8	35.8	38.2	89.4
30-34	59.3	20.1	24.5	28.1	83.2
35-39	47.8	12.0	14.8	17.2	74.0
40-44	36.1	6.6	8.4	10.7	61.2
45-49	25.5	3.5	4.4	6.0	48.9
50-54	13.4	2.0	2.7	3.6	36.5
55-59	7.1	0.9	1.3	2.1	21.4
60-64	3.9	0.0	0.5	0.5	13.0
65-69	0.9	0.0	0.0	0.0	5.2
70-74	0.0	0.0	0.0	0.0	5.8
75-79	2.2	0.0	0.0	0.0	2.2
80-84	0.0	0.0	0.0	0.0	2.6
85-89	0.0	0.0	0.0	0.0	10.4
90-94	0.0	0.0	0.0	0.0	10.4
95-100	0.0	0.0	0.0	0.0	0.0

Source: Progress out of Poverty Index[®]: A Simple Poverty Scorecard for Malawi based on the 2004/5 Integrated Household Survey.

This PPI was revised in February 2012 based on data from 2004. For more information about the PPI, please visit www.progressoutofpoverty.org.

Malawi Look Up Table Continued

PPI Score	2005 PPP \$1.25/day (%)	2005 PPP \$2.50/day (%)
0-4	100.0	100.0
5-9	100.0	100.0
10-14	99.2	100.0
15-19	97.5	100.0
20-24	96.3	99.8
25-29	91.2	99.4
30-34	86.8	99.3
35-39	77.5	98.7
40-44	67.8	95.5
45-49	56.0	94.2
50-54	41.5	90.0
55-59	24.3	77.4
60-64	17.0	68.6
65-69	8.0	50.0
70-74	5.8	39.4
75-79	2.2	29.3
80-84	2.6	26.1
85-89	10.4	19.1
90-94	10.4	19.1
95-100	0.0	0.0

Source: Progress out of Poverty Index[®]: A Simple Poverty Scorecard for Malawi based on the 2004/5 Integrated Household Survey.

Category Likelihoods according to Ghana PPI™ Score

PPI Score	National Poverty Line		National Food Poverty Line		150% of the National Poverty Line	
	Total Below the National Poverty Line	Total Above the National Poverty Line	Total Below the National Food Poverty Line	Total Above the National Food Poverty Line	Total Below the 150% of the National Poverty Line	Total Above the 150% of the National Poverty Line
0-4	40.3%	59.7%	40.3%	59.7%	40.3%	59.7%
5-9	100.0%	0.0%	85.9%	14.1%	100.0%	0.0%
10-14	88.1%	11.9%	77.9%	22.1%	91.8%	8.2%
15-19	78.5%	21.5%	64.1%	35.9%	95.1%	4.9%
20-24	68.7%	31.3%	46.3%	53.7%	84.1%	15.9%
25-29	52.9%	47.1%	37.4%	62.6%	80.7%	19.3%
30-34	40.0%	60.0%	21.8%	78.2%	65.9%	34.1%
35-39	21.4%	78.6%	9.9%	90.1%	54.4%	45.6%
40-44	17.8%	82.2%	8.1%	91.9%	48.4%	51.6%
45-49	11.0%	89.0%	4.9%	95.1%	31.1%	68.9%
50-54	9.0%	91.0%	2.7%	97.3%	29.1%	70.9%
55-59	2.0%	98.0%	1.1%	98.9%	14.7%	85.3%
60-64	1.8%	98.2%	0.3%	99.7%	6.2%	93.8%
65-69	1.2%	98.8%	0.0%	100.0%	4.2%	95.8%
70-74	0.0%	100.0%	0.0%	100.0%	3.1%	96.9%
75-79	0.0%	100.0%	0.0%	100.0%	4.2%	95.8%
80-84	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
85-89	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
90-94	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
95-100	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%

Source: Microfinance Risk Management, L.L.C. based on the 2005/06 GLSS

This PPI was updated in March 2010. For up-to-date PPIs and other information on the Progress out of Poverty Index™ for Ghana and other countries go to www.progressoutofpoverty.org

Category Likelihoods according to Ghana PPI™ Score

PPI Score	200% of the National Poverty Line		USAID "Extreme" Poverty Line	
	Total Below the 200% of the National Poverty Line	Total Above the 200% of the National Poverty Line	Total Below the USAID "Extreme" Poverty Line	Total Above the USAID "Extreme" Poverty Line
0-4	70.1%	29.9%	40.3%	59.7%
5-9	100.0%	0.0%	62.4%	37.6%
10-14	95.9%	4.1%	68.3%	31.7%
15-19	97.4%	2.6%	41.1%	58.9%
20-24	92.2%	7.8%	33.1%	66.9%
25-29	91.7%	8.3%	29.9%	70.1%
30-34	84.9%	15.1%	16.1%	83.9%
35-39	77.7%	22.3%	7.2%	92.8%
40-44	73.1%	26.9%	5.9%	94.1%
45-49	55.6%	44.4%	3.9%	96.1%
50-54	47.3%	52.7%	2.5%	97.5%
55-59	38.0%	62.0%	1.1%	98.9%
60-64	19.5%	80.5%	0.3%	99.7%
65-69	14.0%	86.0%	0.0%	100.0%
70-74	12.3%	87.7%	0.0%	100.0%
75-79	5.3%	94.7%	0.0%	100.0%
80-84	0.7%	99.3%	0.0%	100.0%
85-89	0.0%	100.0%	0.0%	100.0%
90-94	0.0%	100.0%	0.0%	100.0%
95-100	0.0%	100.0%	0.0%	100.0%

Source: Microfinance Risk Management, L.L.C. based on the 2005/06 GLSS

This PPI was updated in March 2010. For up-to-date PPIs and other information on the Progress out of Poverty Index™ for Ghana and other countries go to www.progressoutofpoverty.org

Annex 13. Estimated Trends in Farmer Incomes and Livelihoods

Table 54. Average Number of Income Sources 2012			
COUNTRY	Client	Control	Overall
Uganda	2.8	2.9	2.8
Malawi	2.2	2.2	2.2
Ghana	2.1	2.2	2.2
Overall	2.4	2.4	2.4

Observation: There was no significant difference in the number of income sources for client and control households. It was differences in the relative importance of different income sources between countries that proved most notable. While crop and livestock production were the top two contenders in all three countries, livestock proved much more important in Uganda where dairy production is a major activity, and much less so in Ghana. Produce trading is an importance third in Uganda, but hardly features as all in Ghana. Produce trading is an importance third in Uganda, but hardly features as all in Ghana. Petty retail trade falls third in both Malawi and Ghana but fourth in Uganda. The results per country are presented in the pie charts below. Note: because households had multiple income sources, the percentages represent percent of income sources mentioned, not percent of households.

Figure 52. Main Income Sources Uganda

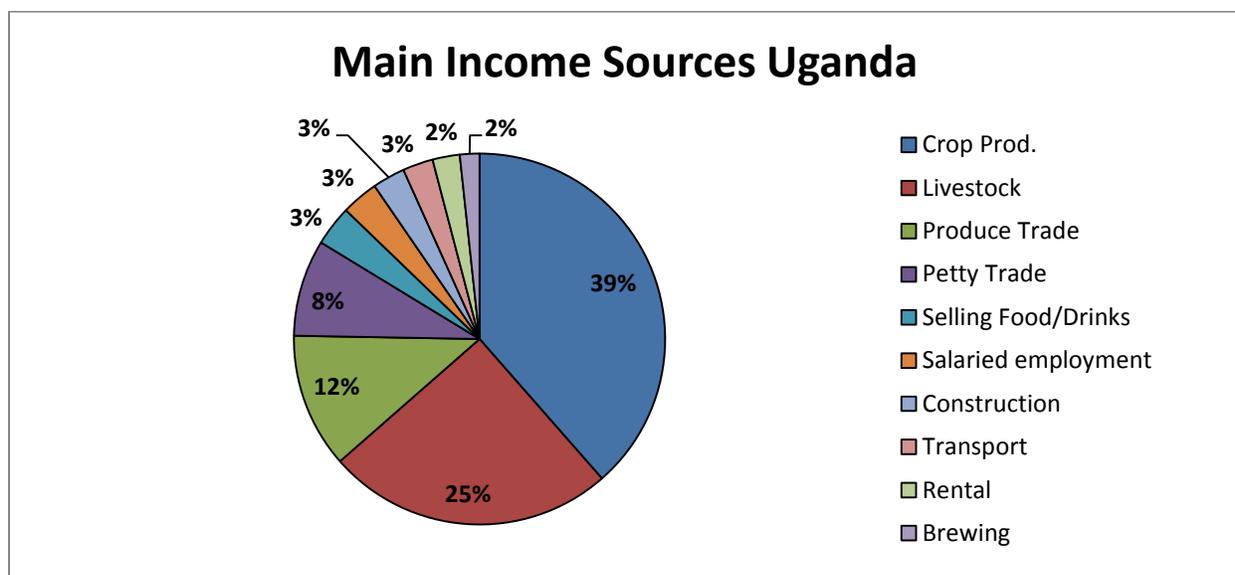


Figure 53. Main Income Sources Malawi

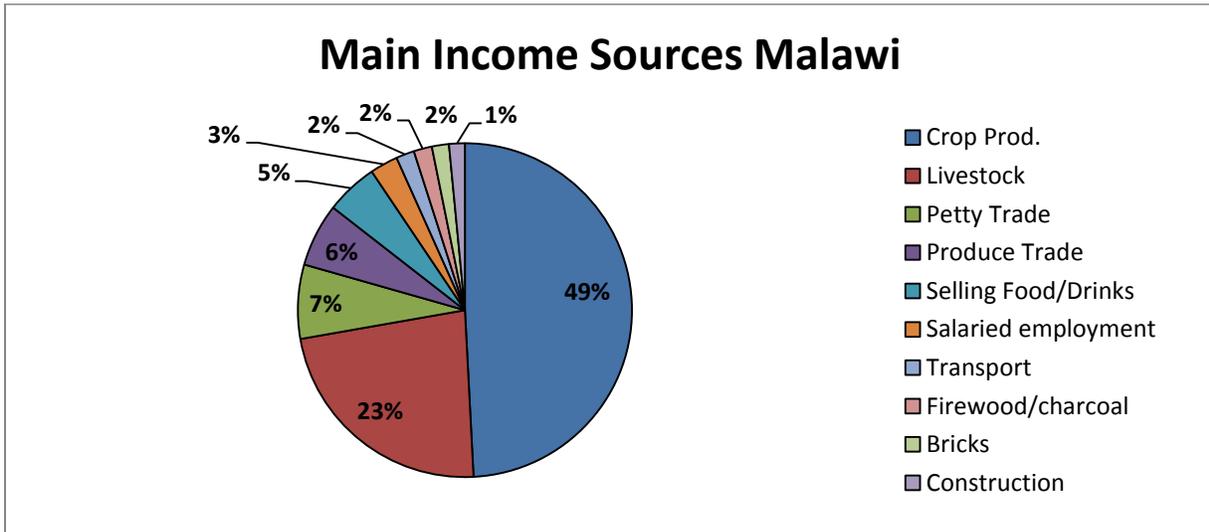
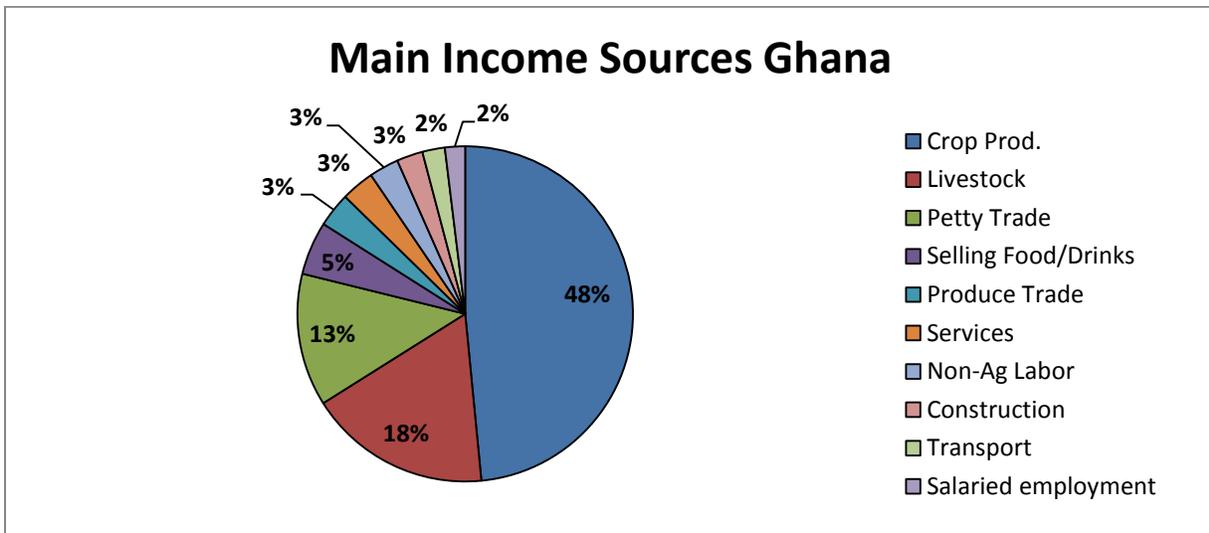


Figure 54. Main Income Sources Ghana



Annex 14. Changes in School Attendance for Children

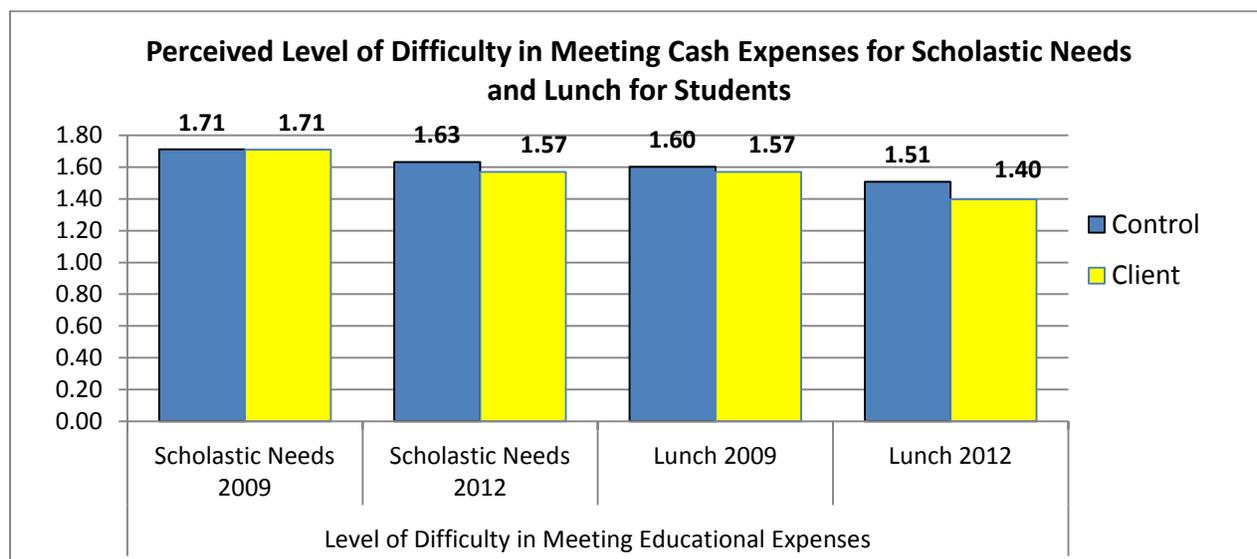
An increase in proportion of households with children in private and boarding schools is noted. The proportion increment in percent of households with children in private schools was higher in the client households in Uganda and Ghana compared to the corresponding increment in the control households. However, overall there is no consistent trend across study countries and status of households (Table 55).

Overall, there has been a decrease in the average number of school days missed by children due to late settlement of dues and reduction in the proportion of households experiencing difficulty in providing for their children's education requirements. There is no consistent trend across countries and status of households. However, client households in Ghana performed better on all the measures compared to the control households.

Table 55. Changes in Various Proxy Indicators of School Attendance for Children

Percent Change In 2012 Relative To 2009 By Country And Status Of Household								
Characteristic	Uganda		Malawi		Ghana		Overall	
	Client	Control	Client	Control	Client	control	Client	Control
HHs with children in private school	24	16	-9	14	18	15	18	18
HHs with children in boarding school	13	23	0	40	25	-14	10	15
Average number of days missed	-45	-44	10	107	-46	-10	-34	1
HH with difficulty	-5	-18	10	-13	-22	6	-15	-14

Figure 55. Perceived Level of Difficulty Meeting Education Expenses

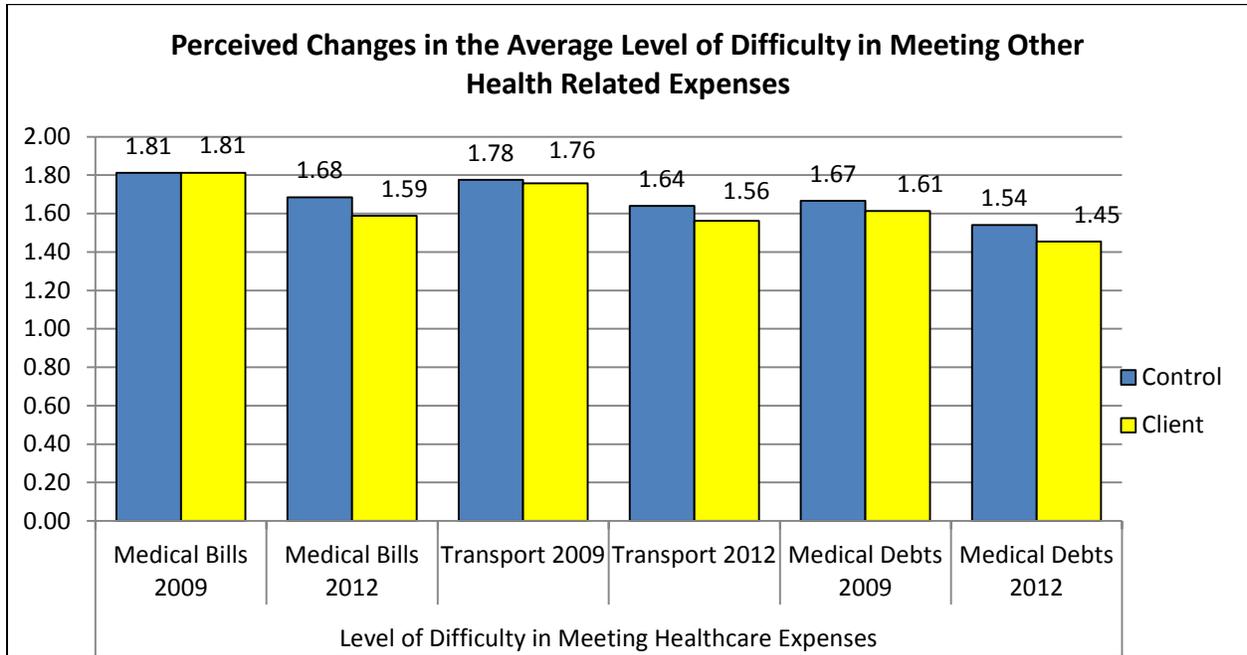


Observation: On a scale from 1 to 3 where 1 is "not a problem" and 3 is a "big problem," on average, the client households' situation with respect to ability to meet educational expenses improved more than did the situation for control households.

Annex 15. Changes in Usage of Healthcare Services

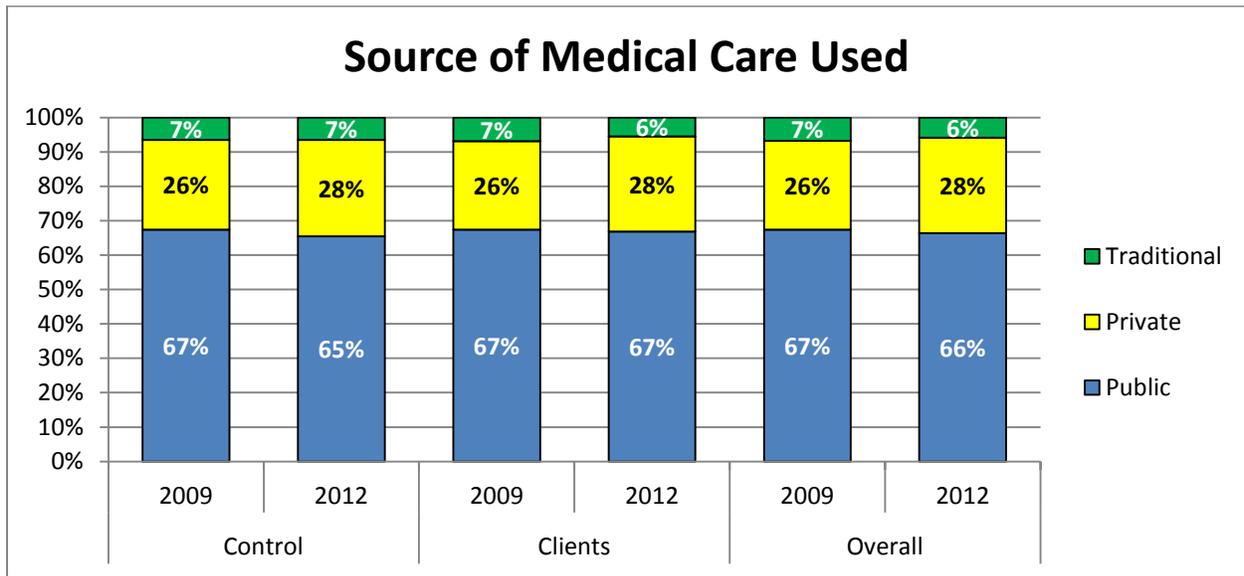
When asked to assess their level of difficulty in meeting health care expenses on a scale from 1 to 3 where 1 is "not a problem" and 3 is a "big problem," on average, the client households' situation improved more than did the situation for control households between 2009 and 2012, but the difference is not great.

Figure 56. Perceived Changes in The Level of Difficulty in Meeting Health Expenses



There was no discernible difference between client and control households with respect to their choice of medical care providers in the two time periods. When broken down by country, the cultural and infrastructural differences were obvious, but there was no apparent relationship to loan status.

Figure 57. Source of Medical Care Used



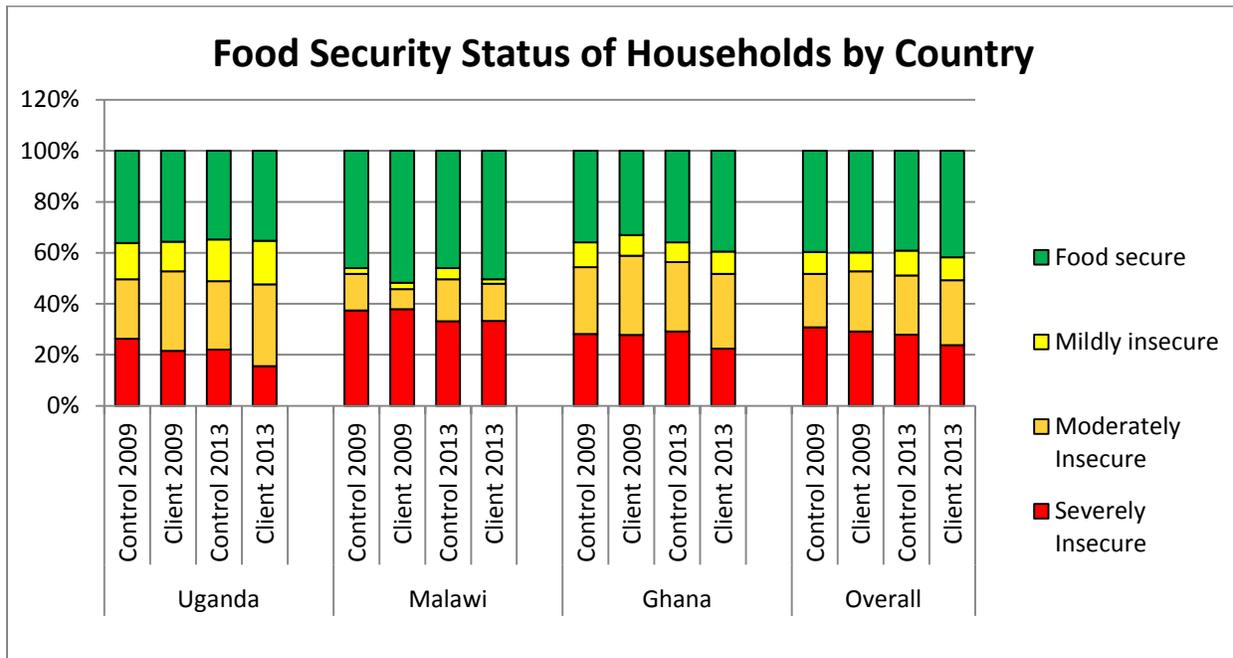
Annex 16. Perceived Impact on Household Food Security

The survey found virtually no difference in food security status between clients and control households. Overall, roughly 50% of all households were severely or moderately food insecure with the proportion declining from 52% in 2009 to 51% in 2012 for Control respondents and from 53% to 49% for Clients. This is not a significant change.

Table 56. Food Security: Changes In The Proportion of Households by Food Security Status

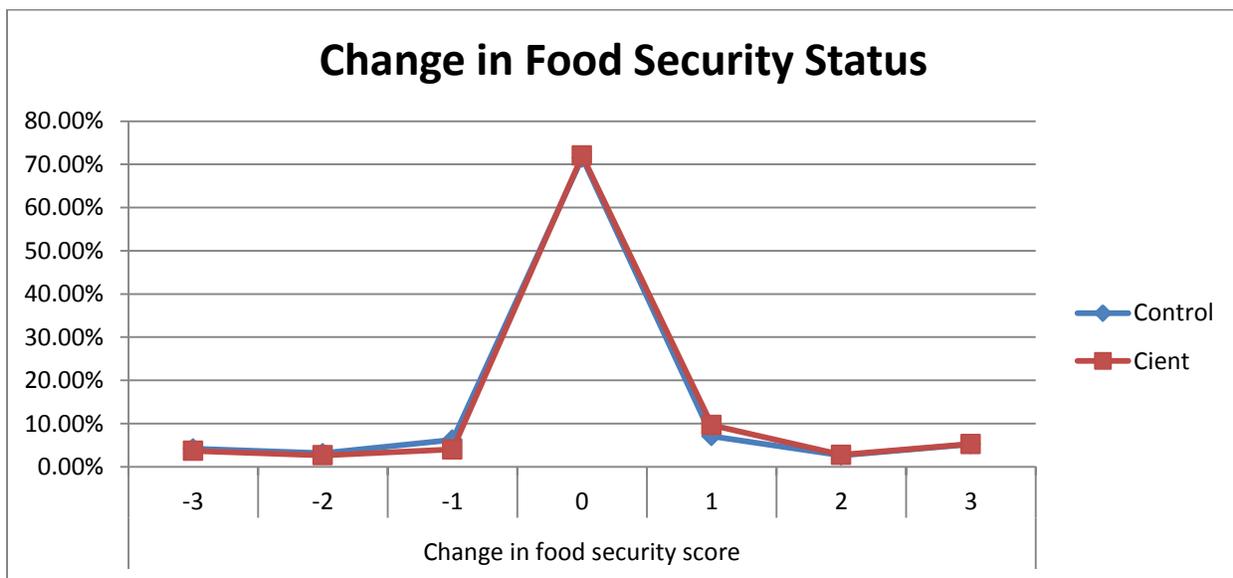
Food Security Status by Country		Severely Insecure	Moderately Insecure	Mildly insecure	Food Secure
Uganda	Control 2009	26%	23%	14%	36%
	Client 2009	22%	31%	12%	36%
	Control 2013	22%	27%	16%	35%
	Client 2013	16%	32%	17%	35%
Malawi	Control 2009	37%	14%	2%	46%
	Client 2009	38%	8%	2%	52%
	Control 2013	33%	17%	4%	46%
	Client 2013	33%	15%	2%	50%
Ghana	Control 2009	28%	26%	10%	36%
	Client 2009	28%	31%	8%	33%
	Control 2013	29%	27%	8%	36%
	Client 2013	22%	29%	9%	40%
Overall	Control 2009	31%	21%	9%	40%
	Client 2009	29%	24%	7%	40%
	Control 2013	28%	23%	10%	39%
	Client 2013	24%	25%	9%	42%

Figure 58. Food Security Status of Households by Country



When the *change* in food security status is graphed a clear bell curve is obvious with most households not making any change between 2009 and 2012, while a small percentage of households shift up or down in food security category. There is a slight tendency for client households to have shifted up (i.e. from highly food insecure to moderately food insecure) and for control households to have shifted down (i.e. from mildly food insecure to moderately food insecure), but this difference is not significant.

Figure 59. Change in Food Security Status



Annex 17. Most Significant Changes

The breakdown of most significant changes by Country and Gender is presented below. Overall, the differences between countries is much more significant than the differences by Gender. Negative responses were most prevalent in Malawi as a result of the recent defaults on the part of soy producers. Ghana was the most positive overall with very few negative results. Uganda had the most mixed results.

Figure 60. Most Significant Change Analysis by Country

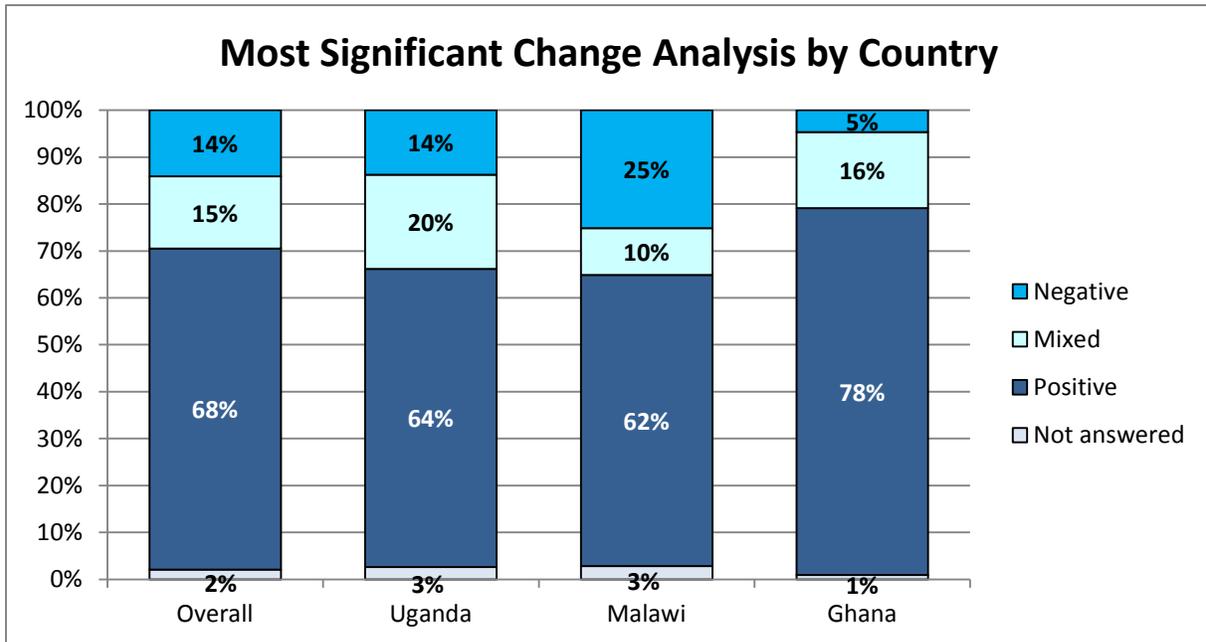


Figure 61. Most Significant Change Analysis by Gender

