Impacts of Certification on Organized Small Coffee Farmers in Kenya

Technical Report · April 2016

CITATIONS
0

READS
74

26 authors, including:

Mica Bennett
Committee on Sustainability Assessment (COSA)
7 PUBLICATIONS **54** CITATIONS
SEE PROFILE

L.W.I. Wairegi
Centre for Agricultural Bioscience International
12 PUBLICATIONS **17** CITATIONS
SEE PROFILE

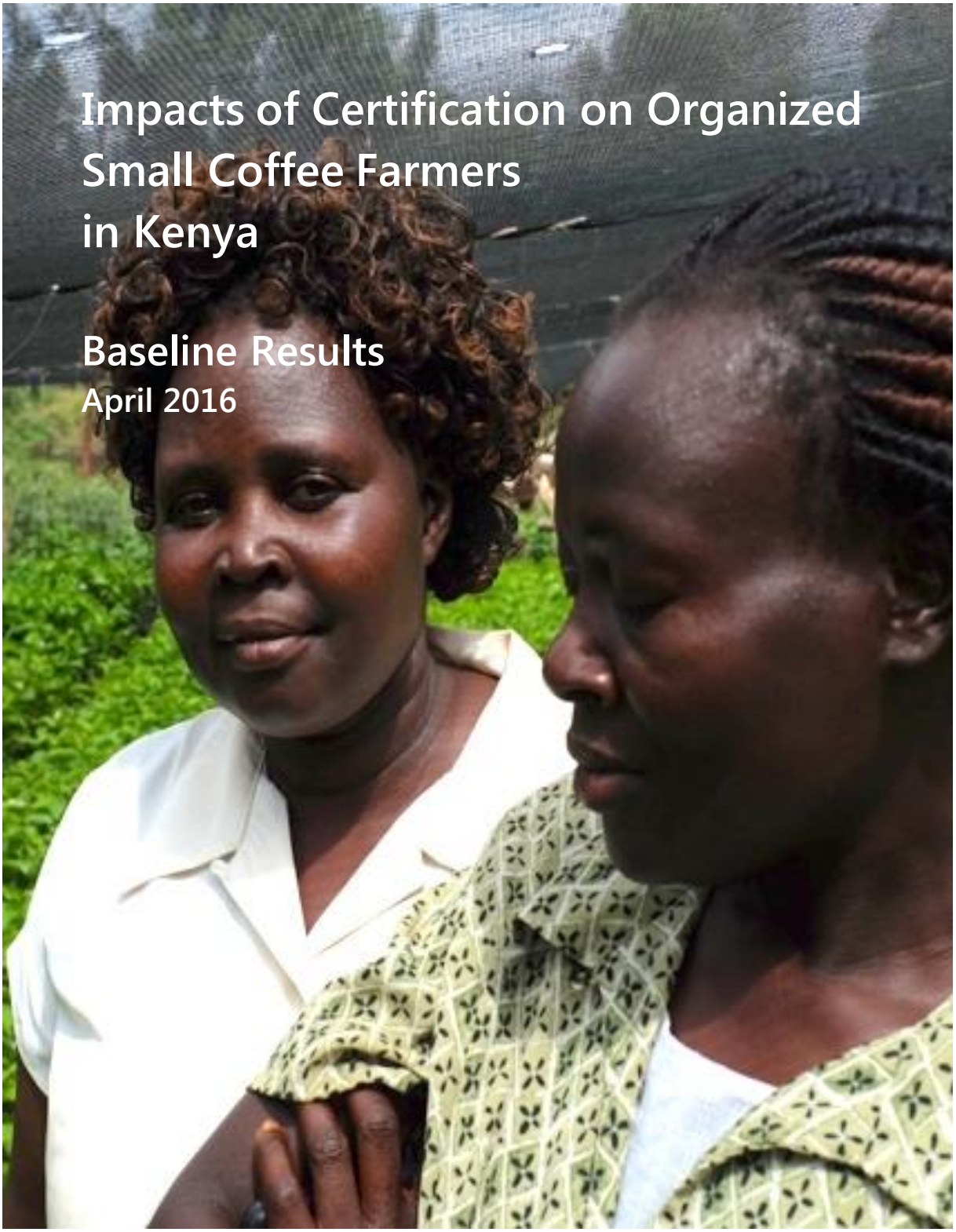
Laurence Jassogne
International Institute of Tropical Agriculture
70 PUBLICATIONS **526** CITATIONS
SEE PROFILE

David Mukasa
Consultative Group on International Agricultural Research
16 PUBLICATIONS **133** CITATIONS
SEE PROFILE

Impacts of Certification on Organized Small Coffee Farmers in Kenya

Baseline Results

April 2016



IITA
Research to Nourish Africa

COSA
Committee On Sustainability Assessment

Acknowledgements

Field researchers: The data collection team for the household survey was led by Josky Gwaka and Gorrety Obuya and included: Jared Amunga, Cyprian Anyim, Vincent Egesa, Mildred Kadesa, Stephen Kemei, Magdalene Kimaru, Esther Masinde, Leah Munala, Julia Nekesa, Henrika Nekoye, Anthony Odada, and Elija Wekesa.

Data analysts: Carlos de los Rios and Ashirl'af Mawanda

We appreciate the invaluable support of the Ford Foundation; the consistent and thoughtful guidance of Kristin Komives, Marta Maireles and Vidya Rangan of ISEAL; the important oversight of Bernard Vanlauwe of IITA; and the invaluable expertise of Howard White and Marcus Olapade of the International Initiative for Impact Evaluation.

Special thanks go to the participating farmers, the management of the farmer cooperative societies, and the staff of the Coffee Research Institute, in particular Stephen Wabwile who provided critical operational information. Equally, thanks go to Kate Kilpatrick, Lee Byers, and Frank Olok of Fairtrade; Julius Nganga and Tessa Laan of UTZ; and Steven Kithuka of Solidaridad all of whom generously provided information about the workings of standards systems.

This report would not have been possible without the support provided by CMS staff, especially David Nyamu, Joseck Barasa, Ambrose Kirobi and Catherine Ng'ang'a in both background information and field activities. We also thank Louise Salinas and Patrick Kerr of COSA, as well as Hilde Koper-Limbourg, Linda Wangila and Silas Obara of IITA for able administration.

Authors: Mica Bennett, Carlos de los Rios, Matthew Himmel, Lydia Wairegi

Contributors: Herbert Ainembabazi, Eddidah Ampaire, Laurence Jassogne, David Mukasa, Pamela Pali, Gayatri Ramnath

Supervision: For IITA, Generose Nziguheba and Piet van Asten provided insight and guidance. For COSA, Daniele Giovannucci and Saurin Nanavati provided vision and coordination oversight.

Design: Audra Wilson-Max

Editing: Francesca Martonffy

Proofreading: Hannah Ekberg

Statistical significance used in the analysis and presentation of findings, except where noted, uses one to three asterisks as follows: * p<=0.10 or at least 90 percent level of confidence; **p<=0.05 or at least 95 percent level of confidence; ***p<=0.01 or at least 99 percent level of confidence. These are calculated using t-tests.

Table of Contents

Executive Summary

This report describes the initial process and findings of a study to understand the impacts of dual Fairtrade-UTZ certification on smallholder coffee farmers in Kenya over the course of three years. It depicts conditions at baseline for farmers and their producer organizations (POs) before any certification activities have occurred. Conducted in partnership with ISEAL, Fairtrade International, and UTZ Certified, the study aims to provide relevant findings for the development of tools and methods that ISEAL members can leverage to better understand the impact of their sustainability efforts going forward.

The work is designed to compare changes in the performance of certified farmers over time using a set of combined COSA-ISEAL Common Core indicators that will uncover the diverse effects of certification, especially as it relates to improved livelihoods and poverty reduction. Certification is being implemented by Coffee Marketing Services (CMS)[1] as part of a project funded by Solidaridad in collaboration with several producer organizations. End line measurements will be taken in 2017 (approximately two years after this baseline). The capacities and qualities of the POs are expected to be important determinants of the impacts that their member farmers experience. Therefore, they are an important part of this assessment.

The target sample group consisted of two POs that CMS selected for implementing certification. We also selected two different control groups: a CMS-control composed of two POs that were CMS clients in the 2013-14 production year and that are from the same agro-ecological area as the target POs and a non-CMS control composed of two POs that were not clients of CMS in the 2013-14 production year and that are also from the same agro-ecological zone. From these groups we randomly selected 696 farmers or 116 from each PO to obtain a representative sample.

Leveraging mixed methods

Since the conditions of this project reflect increasingly typical conditions of certification projects[2], a considerable effort was made to develop a research approach that was appropriate for this purpose and could be useful for similar situations faced by ISEAL and its members in the future. The study employs a mixed method approach combining both qualitative and quantitative best practices that are suitable for the conditions in the study area. The International Initiative for Impact Evaluation (3ie) collaborated on the Research Plan and its execution and concurs that mixed methods are needed for situations such as this where two factors exist: 1) selection bias (introduced here by the implementing agent when choosing POs for certification); and 2) a small number (n) problem because too few producer organizations in the area meet the necessary criteria to be targets or controls. The latter limits the statistical power needed to attribute impacts to certification using quantitative methods alone. The mixed-methods approach that we have designed combines quantitative and qualitative tools that take advantage of the individual strengths of each methodology and, together, allow for a better understanding of the causal paths and impacts of an intervention.

[1] CMS is an official Kenya Coffee Marketing Agent managing the field processes for training and certification. It selected the targeted POs for this study.
[2] Targeted farmers are often subject to diverse interventions from different entities, such as training or financing that confounds the ability to discern the effects of a single or group of interventions (e.g. certification). Further, farmer groups are often selected for certain characteristics that make it challenging to identify appropriate controls for fair comparisons.

The quantitative methods include a difference-in-differences (DID) component to determine the degree to which change will differ among targets and controls at end line. This analytical approach does not depend on target and control groups having the same performance levels at baseline. The formulas that will be used at end line to specify or quantify the impact of the intervention will allow fine-tuning for the intrinsic differences in the basic conditions of the target and control groups. The qualitative tools, focused around contribution analysis, are used to gain a deeper understanding of the reasons for the observed results and the extent to which results are "attributable" to certification efforts. In short, the quantitative methods measure the change; contribution analysis allows for more reliable attribution and will explain some of the reasons for the change at end line.

In addition, to facilitate what are otherwise complex factor comparisons, we also created indices to better understand the key characteristics of POs and how PO characteristics relate to their performance on impact-level indicators. These indices summarize the data according to the theories of change published by Fairtrade[3] and UTZ[4]. They provide a straightforward, intuitive tool for summarizing indicators across the six producer organizations. At end line, we will look for changes in these indices and the underlying indicators to gauge if target POs improved in vital areas and if the changes in POs track well with the performance of their farmers.

Basic producer group, farmer, household, and farm characteristics

The producer groups in the sample have all operated for between 20 and 60 years. They were formed under Kenya's formal cooperative society laws mandating that all coffee from smallholders be sold through cooperatives. Membership ranged from 1,032 to 2,619 farmers with some of the smaller POs having split into additional groups over time. All POs returned 80 to 82 percent of coffee revenue to farmers; Kenyan law does not allow POs to return less than 80 percent. The portion of revenues retained must cover costs of PO operation, including wet milling of the farmers' fresh cherry coffee.

The farmers are on average poor – regardless of the definition of poverty that is applied – they are also middle-aged, and have at least 20 years of experience in growing coffee. Most have nearly completed primary education. Roughly one third of decision-makers are women. Household have six members on average. The coffee production plots are small, little more than a third of one hectare. This indicates that the farmers are generally similar to many others in the region. While the target displays some statistically significant differences from the control groups, the differences generally are not large in terms of absolute numbers.

The Intervention: Training

For all groups, most farmers that participated in training during the baseline year attended only sessions on coffee farming methods. The methods that garnered the most attendance were pruning, synthetic and organic fertilizer use, and soil fertility management. Training to date was significantly lower for the target POs than the control groups, an unexpected result given that the stated approach of the organizer (Coffee Marketing Services) includes training for farmers.

[3] Fairtrade Theory of Change: http://www.fairtrade.net/fileadmin/user_upload/content/2009/resources/140112_Theory_of_Change_and_Indicators_Public.pdf

[4] UTZ Theory of Change: https://www.youtube.com/watch?v=1injB_fzeOE

Economic conditions

Several key observations can be drawn regarding the economic conditions of farmers at baseline:

1) **Farmers are poor, coffee is not economically profitable**
   The farmers in the sample POs are poor and devote only a small portion of their modest plots to producing coffee. The ratio of cash outlays to revenue is 15 percent. If accounting for the valuation (e.g. opportunity cost) of family labor, however, coffee is not economically profitable on average.

2) **Productivity is not up to potential**
   Conditions in the region can result in yields of more than 2,000 kg gbe[5] and some farmers achieve this. Average yields, however, are less than 500 kg gbe for the sample POs. Technical efficiency analysis shows high potential for interventions to increase incomes by raising the efficiency of farmers toward the level of the most productive farmers. Average technical efficiency is currently less than 50 percent for all sample groups.

3) **Low practice adoption (fertilizer, pesticides, weeding, pruning) overall**
   In terms of productivity practices, the rates of adoption for synthetic fertilizer and pesticide are highest for the target group, but still low overall. Farmers who use these inputs do so with roughly the same intensity (indicated by amount spent) in all sample groups. For weeding and pruning, the rates of adoption are higher, but intensity is low.

4) **Reasons for low adoption center around poverty, distrust, price and lack of incentives**
   Information from farmer focus groups, producer survey data, and PO surveys suggest that the sample farmers' low adoption of good productivity practices is the result of a combination of factors including: competition for time and investment resources, low and volatile coffee prices, a lack of price incentives for quality, high levels of distrust throughout the coffee supply chain, and limited follow-up with farmers to help ensure that practices are followed.

End line data will clarify impacts of individual factors on adoption

At end line the data will allow comparison of changes in various factors and whether there are valid correlations to the observed changes in yields and income. In addition to understanding the levels of attribution or contribution, this will allow a rigorous analysis of the impacts that the various factors have and how these factors may be interacting to affect adoption and outcomes.

Poverty

We looked at poverty from three diverse perspectives to get a full picture: asset classes; Progress Out of Poverty Index (PPI) scores; and relationship to international poverty lines (USD 1.25, 2.50 and 3.10 per day). Regardless of which definition of poverty is applied, sample farmers are indisputably poor. Each way of measuring poverty resulted in a different magnitude of poverty indicated. However, for each method, the target groups generally did not show any significant differences from the control groups. For example, among the target group 66 percent of households had incomes less than the Kenyan national poverty line of USD 22 per month per household member while 73 percent of the non-CMS controls were below that threshold. The PPI measurement estimated rates of households with members living in extreme poverty (below USD 1.25 per day) ranging

[5] green bean equivalent or the final product to permit global comparisons

from 41 percent for the target group to 44 percent for the CMS control. For all ways of estimating poverty, the farmers identified as poorer received more of their total household income from coffee even though they spent less on coffee production and had lower coffee income. They also had total household net income less than one quarter of the richest households, adopted fewer measures for soil and water conservation, and experienced more hunger.

Social conditions

Social conditions are challenging as might be expected given the economic conditions in the study area. More than a third of all farm households experienced some days of hunger. A majority of farms used smoky cooking fuels and had no kitchen ventilation, conditions that are typically indicative of poor housing and health conditions. Nearly a third of primary school children are at a grade level lower than that which is locally appropriate for their age.

Farmer perceptions of quality of life generally aligned with the more tangible or objective indicators. Fewer than half the farmers reported that quality of life was good or very good. Despite these poverty levels, most farmers thought the prospects for coffee farming were good or very good and most would be satisfied if their children became coffee farmers.

Environmental conditions

Environmental conditions tend to indicate only low levels of conservation and soil stewardship suggesting the potential for longer-term declines in yields and living conditions around the farm households. Farmers are taking modest care to protect soil from erosion and promote its ability to make water and nutrients available to plants. Most farmers engaged in at least one water or soil conservation practice. However, few farmers applied two or more practices. Additionally, 54 percent of the sample said that the community exercised only fair or poor care of the environment.

Vital observations

In addition to the conditions at baseline, we made several vital observations that we believe will influence this work going forward:

1. Limited evidence for theory of change about POs influencing farmer performance

We constructed indices that are informed by data from the COSA survey of POs so as to observe the Fairtrade and UTZ theories of change that relate PO capacity and strength to farmer performance. These indices allow an intuitively understood picture that compares different PO performance levels and allows comparison to farmer performance.[6]

The results, in this case, did not find a strong connection between elements of the theory of change for attributes of POs that are expected to influence farmer performance. Target POs which did not rank strongly in the transparency and democracy of processes, gender inclusion, and business planning ranked well on impact-level indicators for farmers, especially indicators that are important to the Fairtrade and UTZ theories of change. These include member yields, and percentage of households 1) saying quality of life is

[6] This tool that generated the indices is in development and we invite discussion and collaboration from ISEAL members to further refine it

good or very good, 2) with no hunger, 3) with access to drinking water, 4) with lead coffee farmers that are women or that are under 35, 5) that have infrastructure projects in their community and 6) that are happy for their children to be coffee farmers. It is possible at this initial stage of the research that the expected positive effects of stronger management were not detected by the PO tool. At end line, we will see if there was change in the measures indicating a strong PO and if these were accompanied by change in farmer performance. We will also test some additional indicators to better understand PO performance.

2. Complex role of marketer as implementer

Having an entity that markets products and also implement certification offers the potential for some strong and useful synergies that can benefit farmers. In general it would appear to be a useful arrangement that has clear merit in regard to the market-oriented connectivity for farmers and sustainability practices. However, it may also introduce some potentially unavoidable conflicts of interest. CMS appears to bring an earnest conviction toward wanting to improve livelihoods for West Kenyan farmers. They have strong experience in coffee production and understand how the market values and pays for coffee. However, there are trade-offs. Without an implementer dedicated to development, some complications can occur

A look ahead to

At end line, we will review the certification-related influence and the activities that were conducted and assess these in light of any changes in the performance of certified farms in comparison to non-certified farms (noting their activities and performance). Notably, several POs with which CMS initiated certification processes have now elected to likely not pursue certification. For example, membership of one PO voted to change marketing agents, meaning certification could not go forward.

As of February 2016, only one PO in the sample (PO A) is currently pursuing certification, though it is possible that PO B will ultimately pursue certification (but not within the 2015-2016 production year). Given the need for at least one PO to become certified in order to asses impact, ISEAL and its partners may want to monitor this situation between now and end line to ensure that follow-up assessments can occur with at least one certified PO.

Introduction

Background

This report captures the conditions at baseline for smallholder coffee farmers in western Kenya targeted for dual Fairtrade and UTZ certification. It is part of a three-year initiative to evaluate the impacts of certification and of the Demonstrating and Improving Poverty Impacts (DIPI) project. Initiated by the ISEAL Alliance and supported by the Ford Foundation, the DIPI project leverages and tests various monitoring and evaluation methods that can be replicated by other ISEAL members in order to improve sustainability efforts particularly on issues related to poverty alleviation.

The work compares changes in performance of certified farmers against a set of combined COSA-ISEAL Common Core indicators. The certification initiative is a joint effort by Coffee Marketing Services (CMS)[7], a Kenyan Coffee Marketing Agent (CMA) specializing in sustainably produced coffee, UTZ and Fairtrade. CMS proposed implementing Fairtrade[8] and UTZ Certified[9] standards systems in three cooperative producer organizations (POs) over approximately two years. Solidaridad provided the needed funding.

The project

CMS initiated the project in response to Solidaridad's solicitation of proposals for certifying coffee farmers to Fairtrade and UTZ standards. According to CMS, it selected the region because of need – Mt. Elgon is one of the remotest areas where most companies would not want to engage. CMS thought it could help close this gap for the Mt. Elgon farmers.

CMS determined that due to poor coffee processing training and consequently poor processing skills, coffee in Western Kenya is down-graded at the factory, creating poor demand and attracting low prices in the market. In addition, poor coffee husbandry, inadequate or nonexistent linkages to field extension services, low value addition at each stage of the value chain in particular secondary processing, and the poor returns to the farmer have been the main factors contributing to the low production of coffee in the Mt. Elgon region. To correct these conditions, CMS proposed to:

[7] CMS secured funding from Solidaridad, a non-governmental organization that engages supply chain actors in innovative solutions to improve production so as to ensure the transition to a sustainable and inclusive economy. Solidaridad is funding cash outlays for the initiative such as audit fees and required protective gear for farmers, while CMS is contributing in-kind services such as training and organizing internal control systems.

[8] Fairtrade seeks to connect disadvantaged producers and consumers and promotes fairer trading conditions and empowers producers to combat poverty in order to improve control over their livelihoods.

[9] UTZ is a standard and a program for sustainable coffee, cocoa, tea, herbals and hazelnuts. Its mission is to make sustainable the norm, helping farmers, workers, and their families to fulfill their ambitions, and contributing to safeguard the world's resources, now and in the future.

1. Assist small scale farmers in Western Kenya in improving yields, quality, and access to markets through training, certification, sustainable farming and better links to market
2. Assist participating farmers in adopting sustainable coffee production in order to protect the ecosystem and increase market access
3. Assist farmers attaining UTZ Certified and Fairtrade certification in order to ascertain traceability, improve efficiency and increase market access

The proposal facilitated certification of three POs selected by CMS: Kapsikisio, Sasuri and Kimologit. CMS chose these POs because they had the capacity to improve on quality and quantity of coffee produced. Kapsikisio had already received training and neared certification before the COSA-ISEAL study could begin, therefore it was not included in the target group. Kimologit decided after many of the implementation steps had been completed that it wanted to pursue other directions, according to CMS; Chepkube replaced it as a candidate, thereby leaving Chepkube and Sasuri as the two target producer organizations.

Table 1.1 shows the process CMS proposed for the POs to obtain Fairtrade certification.

Table 1.1 CMS proposed process for Fairtrade certification

1. Perform gap analysis.
2. Oversee meeting between the FT liaison officer and Board members of each FCS (Farmer Cooperative Society) to introduce the principles and standards.
3. Conduct promoter farmer elections, form farmers into groups and train on Good Agricultural Practices (GAP). Promoter farmers will be trained to do all pest control spraying for farmers.
4. Perform fortnightly quality analysis during processing period with CMS-Eldoret Mills (for CKCM) and use results for quality monitoring.
5. Do soil testing and distribute results to farmers.
6. Set up six demonstration plots and conduct monthly training on coffee calendar of activities.
7. Train processing staff on good processing practices.
8. Make sure all required signage is posted and FCSs meet all good labor practices for processing staff.
9. Purchase, distribute and train promoter farmers and FCS management on use of complete Personal Protective Equipment (for pesticide application).
10. Purchase, distribute and train on use of first aid kits (during Occupational Health and Safety training).

11. Develop the Internal Control System, help the PO internalize and comply with it.

12. Complete application and registration with FLO for FLO Audits in May/June upon confirmation.

CMS expects that together these certifications will advance coffee farmers' livelihoods due to complementary strengths that ultimately improve quality and productivity. According to CMS, UTZ Certified is known for its focus on productivity and farmer management issues while Fairtrade is known for producer group-level strengthening and the Fairtrade minimum price and premiums. The marketing agent also expects better quality, not price premiums, to improve prices received by farmers. Along with higher yields, quality should increase revenue for farmers and agents.

The Kenyan Coffee Context

Kenya's rich soil and temperate climate can produce some of the best coffee in the world. Coffee in Kenya currently accounts for six percent of the country's agricultural exports and in 2014/2015 coffee production amounted to 900,000 60 kg bags, representing less than one percent of the world's coffee and ranking Kenya the 17th largest coffee producer in the world. This volume is foreseen to be maintained in 2015/2016.

Current production levels represent a decline of more than 60 percent from peak production in 1987. Probable explanations for the decline include the underfunding of research to find good pest and disease-resistant varieties; high incidences of pests and diseases, such as coffee leaf rust and berry disease; the high cost of labor and inputs; erratic rains; competition from other farm enterprises; low coffee prices worldwide ('86-'92; '98-02), and the lifting of the International Coffee Agreement's (ICA) statute that favored African Arabicas. In addition, some studies cite the inefficiency of coffee cooperatives with media calling attention to difficulties with coffee exporters and wide-spread corruption.

Smallholder farming dominates Kenya's coffee sector. In 2013, there were 600,000 smallholders with less than one hectare of coffee, accounting for 75 percent of the land dedicated to coffee in Kenya. Smallholder productivity lags behind that of estates (over 25 hectares), with estates producing 46 percent of coffee on only 25 percent of the land. Smallholder yields averaged 213 kg/hectare annually in the period from 2005-10, while estate yields averaged 543 kg/hectare.

Buying and Selling

Cooperatives and marketing agents are pivotal in Kenya because, according to Kenyan law, coffee farmers must sell their coffee through producer organizations (POs), which are organized as registered Farmer Cooperative Societies. The POs wet process their members' coffee, giving POs a major influence over the quality of the coffee that eventually reaches the market. Kenyan law allows POs to retain up to 20 percent of coffee revenues from selling members' coffee to cover PO expenses. According to a CMS representative, some POs retain as little as 10 percent. All sample POs in this study retained between 18 and 20 percent of revenues.

All POs in Kenya must use a Coffee Marketing Agent (CMA) to sell their coffee, either by offering it at the national weekly auction in Nairobi or through arranging direct sales to interested buyers. As of January 2016 there were eight Coffee Marketing Agents (CMA) in Kenya. Marketing agents transport coffee to mills for parchment removal, sorting, and

bagging. For the auction, marketing agents secure dry milling, prepare and classify the coffee, prepare catalogues for the dealers before the auction, and set reserved prices for each lot of coffee sold. Marketing agents also ensure coffee warehouse receipts are in order. By law, PO coffee needs to be stored and registered with the Coffee Board until auction.

Direct sales require a marketing agent to directly negotiate with a buyer outside the country and to register a signed sales contract with the Coffee Board of Kenya. While direct sales can be more profitable and are sought after by POs, 85 percent of coffee is sold through the auction. POs enter into new contracts with marketing agents each year and may change marketing agents.

The region

The Mount Elgon region where Bungoma County is located is one of Kenya's poorest regions. All the sample POs are in Bungoma County. Even so, 57 percent of county residents completed primary school and 37 high schools, compared to 52 and 27 respectively for rural Kenya. Agriculture is the primary occupation in the county with 50.3 percent involved in agricultural production compared to 43.5 in rural Kenya. The most important crops produced are maize, wheat, sugar cane, tea and coffee.

The region is reportedly emerging as Kenya's next "coffee belt." Bungoma has 30 coffee POs representing around 6,000 members. These account for about 6 percent of Kenya's coffee PO members and they farm about 7 percent of the estimated area devoted to smallholder coffee, but produce only about 4 percent (1280 metric tons) of the country's coffee.[10]

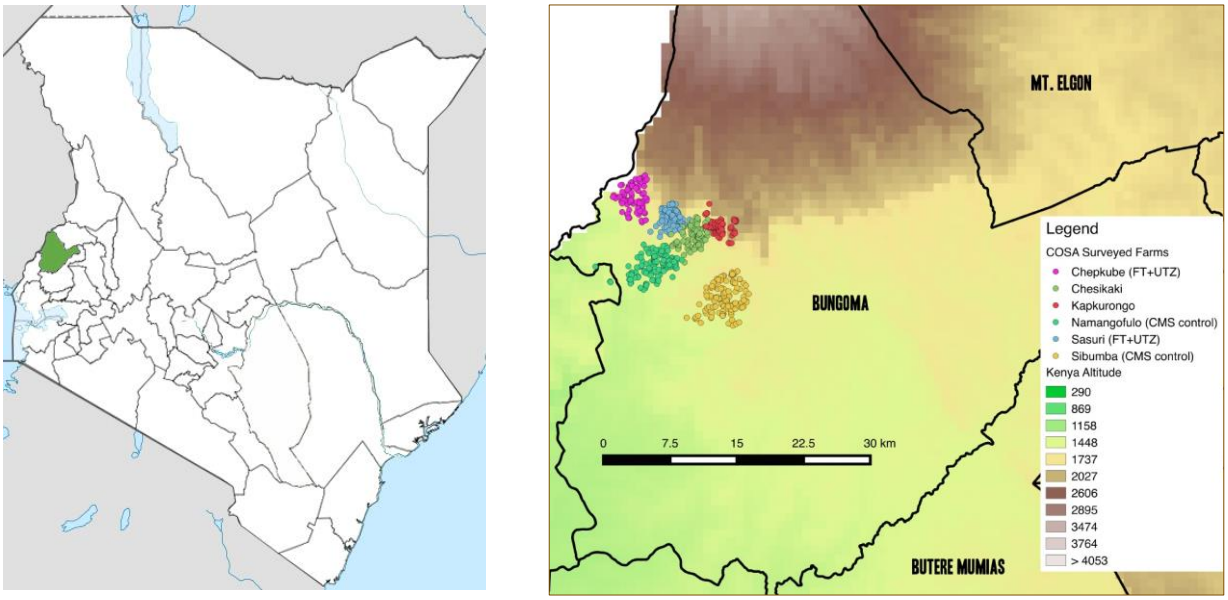
Figure 1.1 Left shows the location of Bungoma County close to the Ugandan border while Figure 1.1 Right shows the clusters of sample farms within their POs in relation to the Mt. Elgon peak. Their location puts the farmers far from the Nairobi Coffee Auction where all the county's coffee production must be shipped for sale unless farmers smuggle it over the Ugandan border. Compared to the country's more established coffee producing areas, Western Kenya has less experience with standards and certification. It also faces processing and quality challenges.

[10] Kenya Coffee Directory, Kenya Coffee Traders Association, 2012. Accessed at https://issuu.com/kcta.coffee.directory/docs/kcta2012. According to the directory, the figures on coffee production represent a typical good year between 2008 and 2012

Figure 1.1 Project site

Left: Location of Bungoma County within Kenya

Right: Location of the sample farms by PO in Mount Elgon



Objectives

This study will examine the early impacts[11] of preparation for, and certification of, Fairtrade and UTZ coffee standards on organized smallholder coffee farmers in Western Kenya by comparing results before and after the intervention takes place. Its goal is to understand the effect of standards systems especially in terms of livelihood and poverty reduction and to propose useful assessment approaches that ISEAL and its members can undertake to understand their impacts in similar settings. There are six main research questions that this study will investigate and which will be answered in the assessment and follow-up study at end line:

Research Question 1:

What are the changes that occur at the farm, household, and cooperative levels leading up to certification to the combined Fairtrade and UTZ standards and again after three years of certification?

Research Question 2:

Do different types of farmers, such as those with different initial assets, poverty levels, or gender, experience differing changes in outcomes over time and what is the degree of difference?

[11] In this context, early impact is defined as the impact that can be measured in the three years leading to certification and the period of time immediately after certification occurs.

Research Question 3:

Can any observed changes in farm or PO performance be attributed to the combined Fairtrade and UTZ standard systems?

Research Question 4:

What is the added value that Fairtrade and UTZ standards systems bring to POs, farms, and households, beyond training? This will include but not be limited to examining the extent to which farmers and PO managers feel satisfied with the experience of certification (in terms of challenges and cost-benefit perceptions).

Research Question 5:

What contextual factors significantly influence the effect of Fairtrade and UTZ standards systems on PO, farm, and household changes in performance? The factors to test for influence are: the market orientation of the program, Kenyan and global coffee prices, the PO management and structure, livelihood and poverty context, cultural context, and project implementation experience.

Research Question 6:

What are the reasons that different types of farmers (for example, those with different initial assets, poverty levels, or gender) experienced different changes in outcomes, if any such differences are identified in the quantitative analysis?

Methods

To estimate the impacts of the project, changes in outcomes in the target group attributable only to the project and not to other external factors must be assessed. To adequately address attribution, we would need to assess changes in outcomes in the target group in both states: with the project and without the project. Given the implausibility of such a method, economists have used the notion of the control group, whose role is to mimic the target group in the state "without project". In an ideal world, both target and control groups are randomly selected from a specific universe of study (experimental studies). When selection is random, both groups tend to have statistically similar characteristics, minimizing the risk of "selection bias".[12]

In this project, CMS had already selected the producer organizations (POs) for implementing certification. This purposeful selection of the targets, instead of random selection, increases the risk of selection bias, as CMS may have had incentives to select the POs that most likely can achieve certification.[13] Furthermore, a large portion of the intervention is directed towards the PO. These institutions may have differentiated influence over farmers in terms of the array and quality of services provided. Some of them may also be correlated with the effectiveness of certification and expected outcomes leading to too few units of analysis and thereby creating the challenge of not necessarily having enough statistical power for attribution.

The mixed-methods approach

The conditions under which this project was developed complicated the ability to establish attribution using purely quantitative methods. Selection bias is expected at the PO level, as there are incentives for CMS to select producer organizations with higher potential to obtain the certification (for example, better organized institutions, larger number of farmers, more aggregate production, farmers in a better position to meet standards, etc.). In addition, there were too few producer organizations in the area meeting the necessary criteria to be targets, limiting the statistical power for attribution with quantitative methods alone.

For such conditions, explanatory mixed methods offer a viable approach. Explanatory mixed methods use a structured qualitative investigation to determine if a chain of causation, consistent with the theory of change[14], was implemented and could have plausibly explained changes in performance pointed to by the quantitative evidence. The investigation would also consider if breaks in the causal chain occurred where the quantitative evidence may indicate no change in performance. The use of a robust design for collecting quantitative data integrated within a disciplined contribution analysis framework maintains credibility and validity of the impact assessment conclusions while allowing an unbiased assessment of whether standards systems caused the observed

[12] Selection bias occurs when there are differences between the target and control groups that are also highly correlated with outcomes. This problem reduces the potential of an impact assessment to adequately address attribution to the intervention as the results may also be due to such differences rather than the intervention itself.

[13] Randomizing the target within selected POs seemed unrealistic. Randomly assigning training towards certification was considered logistically challenging by the implementation agents (CMS). We also considered that there was a large risk of spillover effects that could have minimized the potential effects of training. On the other hand, randomizing certification within the producer organization is unlikely as it is a voluntary process. There are other alternatives, such as randomizing the possibility of certification, but the logistics of such operations proved complicated in the context of the intervention.

[14] See Appendix C for the simplified chain of causation informing this study.

changes. Further, the qualitative data analysis deepens the understanding of the contribution of contextual and other factors that influence the results of certification. It also sheds light on the reasons that different types of farmers may experience different results upon adopting standards systems.

The mixed-methods approach we have designed for assessing the impacts of certification takes selection bias into consideration and combines quantitative and qualitative tools that enhance the individual strength of each methodology. Together, these factors allow for a better understanding of the causal chains and impacts of an intervention. In order to provide a clearer view of the interaction of qualitative and quantitative methods, Tables 2.1 and 2.2 show the chronological set of steps from the baseline until the end of the process.[15]

Table 2.1 Baseline study elements

Study Element	Step	Tools	Purposes
Setting the grounds (qualitative)	1	Secondary data sources and key informant interviews	Identify candidate PO for control groups
	2	Interviews to key actors (POs, CMS)	Identify activities relative to the Theory of Change
	3	Participatory Rural Appraisals	Understand perception of POs; identify characteristics of marginalized farmers; communicate about the household survey
Baseline data (quantitative)	1	Farm-household survey	Determine initial conditions of target and control groups in CCI-COSA indicators
	2	Producer Organization survey	Gather baseline indicators for PO
Insights (qualitative)	1	Structured key informant interviews	Validate the causal chain as determined by Fairtrade and UTZ standard systems
	2	Focus groups	Provide insights into the reasons for differential performance

[15] For further details on the research plan, refer to Appendix A

Table 2.2 End line study elements

Study Element	Step	Tools	Purposes
Measuring change (quantitative)	1	Farm-household survey	Measure changes between baseline and end line
	2	PO survey	Measure changes between baseline and end line
Establishing attribution (qualitative)	1	Structured key informant interviews	Establish contribution by Fairtrade and UTZ standards systems as well as by contextual factors that may have affected outcomes
	2	Focus groups	Determine if changes in performance for certified groups could be attributed to standards systems
			Provide insights on the contribution of standard system adoption to differential performance by different types of farmers

Quantitative approach

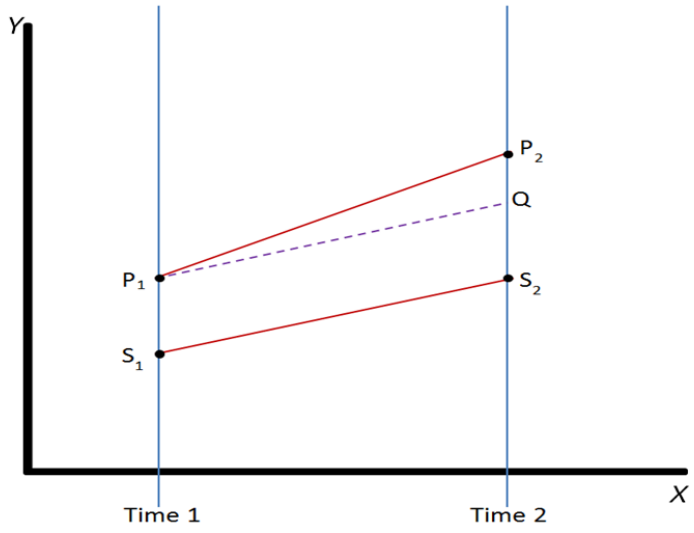
The approach for impact evaluation will leverage a quasi-experimental design using panel data models following the differences-in-differences (DID) approach. This method infers program impact by comparing the change in the outcomes of interest, before and after the intervention for the target group relative to a comparison group. For instance, in a training program, if the goal is to estimate the impact of training on yields, we can use the graphic representation below, where the vertical axis (Y) represents the level of average yields, and the horizontal axis (X) represents time. The yield evolution of the target group is represented by line P, while for the control group it is represented by line S. The yield level is measured for both target and control group at Time 1 (baseline) before either group has received the training, represented by the points P1 and S1. The target group then receives the training and the yield level is measured again for both groups after the training at Time 2 (end line), represented by the points P2 and S2. Not all of the difference between the target and control groups at Time 2 (that is, P2 minus S2) can be explained as being the effect of training on yield, given that a difference already existed between the target and control group at Time 1. This is an unavoidable problem of selection bias; in the absence of such selection bias $P_1 = S_1$.

If the target group did not receive training, the yield growth of the target group would follow the dotted line Q, which is parallel to the line S. DID can overcome selection bias and generate an unbiased estimator of the impact of training, which is equal to:

$$DID = (P_2 - S_2) - (P_1 - S_1) = (P_2 - P_1) - (S_2 - S_1) \quad (1)$$

Note that the assumption is that the line Q that the target group would follow if not receiving training is parallel to the line S and is called the "Common Trend" assumption. This means that the difference between the target and control group that would exist if neither group received training is constant over time. The Common Trend assumption is the key assumption of the DID method in order to generate unbiased estimates.

Figure 2.1 Difference in difference – Common Trend



Selection of controls

For the control group to be a valid counterfactual it must be as similar as possible to the target in observable characteristics. Given the importance of the PO on the implementation of standard systems (training, ICS organization, coffee processing, and marketing, amongst others), we decided to identify the control group at the PO level.

To find POs similar to the target POs but not pursuing certification, we used secondary sources to identify all coffee cooperative societies in the same agro-ecological zone. We also consulted knowledgeable informants such as marketing agents, Coffee Research Institute members, and practitioners at the Ministry of Agriculture to narrow the candidate list to the most similar ones. We also used some of the information from the PO survey to better identify the controls.

We expected to apply statistical methods to find the closest matches among the six control group candidates to the target groups. However, given the limited number of candidates, such statistical methods were neither appropriate nor needed. Instead, "macro-level" factors dictated decisions, disqualifying two of the candidate controls.

These factors included focus on coffee, placement in the same agro-ecological zone, and distance from each other to control for a potential spillover effect.

In order to distinguish the "net value" from training and other elements of certification from the "added value" of certification beyond training, we identified two separate control groups. For the former, we identified POs that do not use CMS as a marketing agent and who were not slated for certification in the near future (Type I controls).[16] For the latter, we identified a group of POs that have CMS as their marketing agent, but are not slated for certification in the near future (Type II controls).[17] In the table below, we can see the comparisons needed to answer the research questions. The target POs (T) selected by ISEAL were PO A and PO B; the type I control POs: *No CMS training and no certification* (C1) are PO F and PO E; and the type II control POs: *CMS training but no certification* (C2) are PO C and PO D.

Table 2.3 Sample structure and research questions

Comparison	Research Question
T – C1	What are the changes that occur at the farm, household, and cooperative level leading up to certification to the combined Fairtrade and UTZ standards and again after three years of certification?
T – C2	What is the added value that Fairtrade and UTZ standards systems bring to POs, farms, and households beyond training?

Sampling

We randomly selected 120 farmers from each of the six selected POs. This sample strategy is expected to have greater than 90 percent power for detecting a 50 percent increase in yield. We used yield (kg/ha) as a benchmark because it is a key indicator that captures the outputs of investments in fertilizer, biocide, labor, and farming practices. In addition, it is a continuous variable that often exhibits high variance in the experience of COSA and many other researchers working with smallholder coffee production. We used a baseline yield of 700 kg/ha with a standard deviation of 650 kg/ha calculated from a data set from Mount Elgon coffee farmers. The estimated 50 percent yield increase comes from the Coffee Research Institute (CRI), which provides some farmer training for CMS. CRI says farmers following the regimen detailed in its training experience greater than 50 percent increases within three years on average. The calculation for sample size allows for a 10 percent attrition rate to give a buffer for farmers who cannot be included in the end line.

Analytical approach

Once the second round of data collection is complete, following Angrist and Pischke (2008), we can estimate a more complex version of equation (1) that will allow us to improve our estimation by controlling for a set of PO-level (*g*) and time-varying (*t*)

[17] This will include but not be limited to examining the extent to which farmers and PO managers feel satisfied with the experience of certification (in terms of challenges and cost-benefit perceptions).

covariates (Z_{gt}), as well as some individual household level (*i*) and time-varying characteristics (X_{igt}), which may be affected by the intervention and also may have some effect over the outcomes:

$$y_{igt} = \alpha_0 + \alpha_1 D_g^1 + \alpha_2 T_t + \alpha_3 * (D_g^1 T_t) + \partial Z_{gt} + \theta X_{igt} + \varepsilon_{igt} \quad (2)$$

Where y_{igt} is the outcome variable; D_g^1 takes the value of 1 for the end line, and 0 for the baseline; a_0, a_1, a_2, ¶, q are the estimated coefficients; and a_3 is the average impact of the intervention.

We use DID regression (2), rather than equation (1) because the common trend assumption may not hold between target and selected control POs. In this case, equation (1) will generate biased estimators. However, regression analysis using (2) can partially correct the bias when the common trend assumption is violated. We use this regression analysis to correct the bias caused by observable factors that are covered in the PO survey, and use qualitative methods to correct bias caused by time-varying unobservable factors that are not covered in the PO survey.

Qualitative approach: Contribution analysis[18]

The contribution analysis framework, adapted for use within an explanatory mixed-methods approach, consists of the following steps. Tables 2.1 and 2.2 show that after the first step of understanding the theory of change, the basic steps are repeated at the baseline and end line phases of the overall project:

- Identifying the activities expected of key actors in order to implement the intervention's theory of change and confirming that the activities occurred. (In this study, few activities to implement certification had occurred. At end line, we will further pursue understanding of the activities undertaken to implement certification.)
- Gathering quantitative evidence to verify whether the changes anticipated by the theory of change occurred among POs and farmers participating in the intervention as compared to similar control POs and farmers. (At both baseline and end line, this consists of administering farmer and PO surveys)
- Gathering qualitative data from informed participants and stakeholders as to whether program activities as implemented could plausibly have caused the observed quantitative changes and why, as well as whether any factors other than certification could have caused the changes. (At baseline, the qualitative data relates to differences observed among different sample groups. At end line, the qualitative work relates to changes in performance observed between baseline and end line.)
- Exploring the effects of contextual factors on the POs and farmers, considering specifically the degree to which these factors could have contributed to the changes observed relative to the standards systems' contribution, as well as whether alternative explanations exist for the changes.

[18] Mayne, J. 2008. Contribution analysis: an approach to exploring. ILAC Brief 16. Available at http://www.cgiar-ilac.org/files/publications/briefs/ILAC_Brief16_Contribution_Analysis.pdf

While standard contribution analysis uses quantitative data to provide evidence on changes, our approach benefits from solid quantitative data and sound econometric methods to minimize selection bias and power issues in the estimation such that the evidence of changes is optimal given the conditions of a typical certification project.

Qualitative Methodology

Farmers

We gathered information from farmers using Participatory Rural Appraisals (PRAs) before administering the producer survey, primarily to adapt the survey to the specific Mount Elgon location. To execute the baseline phase of the contribution analysis, we conducted farmer focus groups at each PO after preliminary analysis of the farmer survey data. The purpose of the focus groups was to gain insights into the reasons for differential performance by different types of farmers, fill in information gaps, and give feedback to farmers and POs on early baseline findings. An open-ended set of questions guided each discussion. PO management selected representative farmers to participate.[19] At end line, we will consider quantitative change in performance in light of information we gather qualitatively on the tools actually used with each of the groups to make inferences about attribution. Table 2.4 shows participation in the farmer groups.

Since farmers had limited time to spend in the focus group discussions, we could not pursue all differences in performance on indicators by the sample groups. We chose to concentrate on coffee production, starting with differences in yield. Yield is a driver of many of the other output and outcome indicators that can make an impact on poverty indicators.

Table 2.4: Attendance of farmers in focus group discussions

Sample group	PO	Participants		
		Males	Females	Total
Target	PO A	8	4	12
	PO B	8	3	11
CMS control	PO C	7	3	10
	PO D	12	0	12
Non-CMS control	PO E	8	3	11
	PO F	9	1	10
Total		52	14	66

Source: Appendix H, Table 1

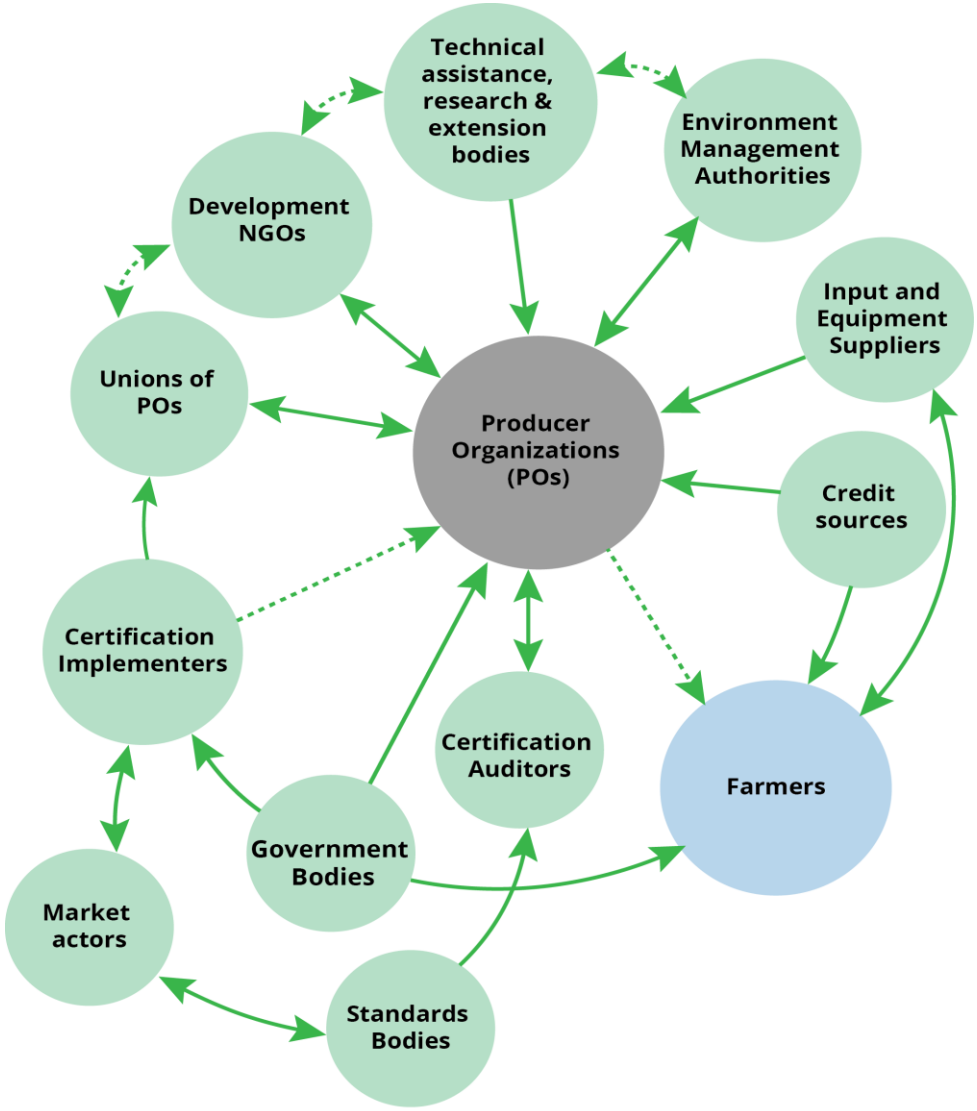
[19] Since farmers were critical of PO management in the discussions, we do not think that selection was biased toward farmers favorable to management. However, it is possible that they were known to management because they tended to be more active in the PO than other farmers. Given that the purpose of the discussion was greater depth of understanding, this bias is not necessarily a problem, particular as it is acknowledged.

Key informants

In addition to gathering information in smaller farmer meetings, we also solicited information from the most relevant stakeholders in the Mount Elgon certification landscape. Figure 2.2 graphically depicts these stakeholders and their interactions. The right side of the figure lists stakeholders consulted as key informants. Information from the key informants was used to triangulate the data collected in the household survey and focus group meetings and get a better understanding of coffee production in the region.

Figure 2.2: Stakeholders in the Mt Elgon certification landscape

Stakeholders in the Mt Elgon certification landscape



Stakeholders used as key informants include:

1. PO leadership – general manager and interested board members of each sample PO.
2. Technical assistance, research and extension bodies – Coffee Research Institute
3. Certification Implementers/Market actors – Coffee Marketing Services
4. Standards bodies – Fairtrade Kenya
5. Development NGOs – Solidaridad
6. Government bodies/Policy makers – The Ministry of Industry, Investment and Trade, Department of Registration of Co-operatives; Ministry of Agriculture

Producer Organization survey and methods

To develop understanding of the impacts of certification on POs and how changes in POs would affect member farmers, we developed a producer organization survey (see Appendix) and administered it to the six POs in the sample. All surveys were administered to groups of PO representatives including the General Manager and interested board members invited by the General Manager. We supplemented the standardized PO questions with any follow-up questions suggested by the interview.

To interpret and present information for understanding the conditions of POs at baseline, we built a framework grounded in the Fairtrade Theory of Change (See Appendices).

Creating indices

Indices can help order large amounts of information and make them more easily understood. These start with the individual results on an indicator for each PO. To ensure contextual validity, the individual result is divided by the highest result obtained from the group. This produces a ranking score giving the PO with the highest result a rank of one for that indicator. The score for the next highest result will be the percent that the result represents of the highest score.

For example, with percent households with no hunger, the top row in table 2.5 shows the raw results. Dividing all the results by the highest (.69) gives the scores in the second row:

Table 2.5 Percent of households with no hunger

Raw	.69	.57	.59	.55	.63	.47
Ranking	1.00	0.83	0.86	0.80	0.91	0.68

The next step is to develop an index by grouping together related sets of ranking scores (e.g. for Infrastructure or Management Systems) and averaging them for each PO. Thus the PO that has the highest rankings on the greatest number of indicators will receive the highest index score. We do not use weighting but it easily could be incorporated.

To give the insight needed for this report on the conditions of POs at baseline in relation to the members, we show the rankings of all six POs together on a single spreadsheet.

We are also creating individual reports to share with each PO that show for each indicator solely their own data and a ‘peer average’ of the results for all the sample POs. These reports will also be shared with ISEAL after we have refined the report to account for the feedback from the PO leaders.

The PO indicators and survey reflect inputs from a multi-stakeholder panel of experts in POs. We have conducted a beta-roll out of the PO work in conjunction with this project. We believe that this approach has served ISEAL and COSA well by catalyzing learning about POs and their effects on farmer well-being.

Baseline Findings[20]

Basic Characteristics – POs, farmers, households, and farms

Table 3.1a displays basic data about the six sample POs. All the POs have existed for at least 40 years with two dating back 60 years. The target group is comprised of an older, larger PO and a newer, smaller PO. Both sets of controls follow this pattern for PO age. For membership size, the CMS control POs are consistent with the target POs in that they include one larger PO (>2,000 members) and one smaller PO while the non-CMS controls are comprised of two intermediate sized POs relative to all the groups.

On the economic side, both target POs have high sales volumes of fresh cherry compared to the other POs, while both control groups have a mix of high and low sales volume.[21] Coffee revenues for 2012-13 were highest for the target POs. Revenues do not correlate perfectly with sales volumes, reflecting the different prices received by each PO. In the Kenyan context, different prices within the same year primarily reflect the differences in grade and cup profile presented at the auction for the coffee.

Table 3.1a Basic characteristics of the sample Producer Organizations[22]

	Target POs		CMS control POs		Non-CMS control POs	
	PO A	PO B	PO C	PO D	PO E	PO F
Year established	1976	1955	1952	1969	1955	1974
Active members 2013-14[23‡]	1,334	2,619	1,032	2,234	1,540	1,278
Sales volume (kg fresh cherry) [24]	542,298	677,850	226,590	552,672	670,861	173,719
Total coffee revenue (USD)	294,370	333,580	97,040	270,970	198,920	71,970
Total value of assets (USD)	229,660	187,160	35,500	111,900	98,960	266,190

[20] Except where explicitly noted otherwise, all data comes from the information farmers self-reported on the Producer Survey. See Appendix for specific survey questions.

[21] There should not be an expectation for sales volumes to track membership size. Some farmers belong to multiple POs, possibly selling most of their coffee to one PO while selling only small amounts to others. This can result in sales per member that do not reflect actual farmer production.

[22] Data comes from the PO Survey

[23] In this section, ‡ denotes ISEAL Common Core indicators.

[24] Comparing age to membership size is deceptive: POs in this setting have histories of dividing. Because transportation is difficult, POs sometimes build new wet mills in locations that are closer to members as a service to them. Then, during board elections, candidates will campaign on the promise of creating a new PO to govern the new facility. PO A, for example, just experienced such a split, while PO C and PO E both have had such splits in the past.

Table 3.1b shows that farmers in the sample are generally middle-aged (around 50 years-old) with 20 years of experience on average in coffee farming. Farmers in all groups have nearly completed primary education. Households have an average of six members. Across all groups, in at least a quarter of the farms women make the main decisions about the coffee. Ninety percent of farmers own their own land.

Sample farms proved relatively small[25], averaging between 0.9 and 1.3 hectares, depending on the sample group. Coffee plots were much smaller, averaging fewer than 0.3 hectares for all sample groups.[26] More than 90 percent of the sample farmers owned their land. The farms are remote from Nairobi where all coffee must be transported for sale and roads are primarily dirt. However, as reflected in the data that farms average fewer than three kilometers from a commercial center, the farms are located near small towns with agricultural supply and other stores that offer basic goods for purchase.

While the target group displayed some statistically significant differences from the control groups in these basic farmer, household and farm characteristics, the differences generally are not large in terms of absolute numbers. The exception is the percentage of the improved variety of coffee trees. The percentage of improved trees for the CMS control is nearly two-thirds larger than the target group. This difference will be accounted for in the end line analysis.

[25] There are many definitions of smallholders. These farmers fit into the FAO characterization of smallholders in its publication, *Framework for Analysing Impacts of Globalization on Smallholders* in that the definition "differs between countries and between agro-ecological zones. In favourable areas with high population densities they often cultivate less than one hectare of land, whereas they may cultivate 10 hectares or more in semi-arid areas, or manage 10 head of livestock. Often, no sharp distinction between smallholders and other larger farms is necessary.

" http://www.fao.org/docrep/007/y5784e/y5784e00.htm#Contents

[26] Coffee area is described in both Table 4.1a and 4.1b. There is a slight discrepancy because POs show the data by PO whilst farmers data is by sample group.

Table 3.1b Selected farm and household characteristics[27]

Indicator	Target	Controls	
		CMS control	Non-CMS control
Farmer and household characteristics			
Farmer age	47.8	55.3***	51.0**
Farmer years of experience	20.7	26.6***	21.9
Farmer school grades completed[28]	8.3	8.9	8.6
Female principal decision maker (percent)	35.6	27.4*	26.4**
Number of household members	5.9	6.1	6.2*
Dependency ratio[29]	88.5	81.1	97.7
Owns all land (percent farmers)	90.4	93.8	90.8
Farm characteristics			
Farm size (hectares)	.93	1.3***	.90
Coffee area (hectares)	0.31	0.26**	0.28
Distance from nearest commercial center (km)	2.2	2.5**	2.3
Tropical livestock units[30]	1.7	1.8	1.3***
Percent of farms with improved coffee varieties[31]	39.0	63.2***	23.5***

[27] Statistical significance used in the analysis and presentation of findings is indicated with one to three asterisks as follows: * indicates that the difference between target and control groups is likely to be true for the population with p<=0.10 or at least 90 percent level of confidence; ** indicate confidence of p<=0.05 or at least 95 percent level of confidence; *** indicate confidence of p<=0.01 or at least 99 percent level of confidence. p-values are calculated using t-tests.

[28] Grades completed indicates the number of grades that a person has successfully passed.

[29] We used the World Bank definition of dependency ratio as the number of household members under 15 plus those over 64 (dependents) divided by those between 15 and 64 inclusive (adults). When the household head was over 64, we included the person in the denominator but not in the numerator (in other words as a non-dependent adult). The ratio shows the relative number of dependents that each adult must support. For example, the target group ratio of 88.7 indicates that on average, target households had slightly fewer dependents than adults. A ration of greater than 1 indicates the family has more dependents than adults.

[30] Tropical livestock units are livestock numbers converted to a common unit. Examples of conversion factors are: cattle = .7, sheep =.1, goats =.1, pigs = .2, chicken =.01

[31] Batian, Ruiru 11, and trees that farmers identify as “unknown improved” comprise the improved varieties. K7, SL28, SL34, and trees that farmers identify as “unknown traditional” comprise traditional varieties.

Training

Training is an important link in the chain of causation, as it is one of the key channels for informing producer organizations and farmers about what the standards are and how to meet them.

Target groups had lowest participation in training

For this baseline, the two CMS sample groups (the target and CMS control) had the smallest percentage of representatives attending training during the 2013-14 production year on any topic for any amount of time. The target sample groups had the smallest percentage of all at 24.3 percent (see Table 3.2). The differences between the target group and both control groups is significant. The average hours attended by all representatives from a farm who participated in training ranged from a low of seven to a high of 11 hours.

Table 3.2 Training participation

	Target	CMS Control	Non-CMS Control
Percent trained	24.3	35.7***	40.2***
Average hours of training	8	7	11

Coffee farming best attended training topic

For all sample groups, the coffee farming topic had the highest percentage of farms with representatives that attended training, with a low of 24.5 percent of target farms and a high of 38.5 percent of non-CMS control farms. Topics within overall coffee farming that were most attended were pruning, use of chemical fertilizers, using compost/organic material/mulch, and soil fertility management, with between 11.3 and 25.2 percent of farmers participating depending on the training and sample group. Few farmers (8 to 14.9 percent) in any of the sample groups received training in soil conservation, new field preparation, or good harvest practices. Very few farmers (0 to 8.5 percent, depending on the sample group and training), received training in protecting water from contamination, integrated pest management, safely handling agrochemicals, and protecting biodiversity.

Table 3.3 Percent of farms with representatives attending training by topic

	Target	CMS control	Non-CMS control
Coffee farming	24.5	34.7***	38.5***
Record keeping	3.8	2.5	3.7
Marketing	0	1.3**	0.8*
Health and safety	3.8	0.81**	3.1
Environment	3.0	2.9	6.7**
Business management	0.4	0.8	0
Gender	0	0	0.3
Other	0.4	1.3	0.3

That the CMS sample groups had a lower percentage of farmers with representatives attending training was unexpected given our understanding that CMS provided substantial training to client POs, even those not pursuing certification. A further unexpected result was that the target group would have significantly greater yields when it also had the lowest percentage of training in the 2013-14 production year. According to CMS, many reasons could lead to fewer reports of farmers with representatives attending training. First, CMS offers the training, but this does not ensure that farmers will attend. Also, farms with representatives attending training could cluster in geographic locations, while the sample farmers had equal chances of being located throughout the PO. Finally, CMS said that farmers often did not recognize who provided training and that some of the training reported in other sample groups may have been input providers who often call their sales efforts 'training.

It is very valuable to have this information on training in the year before any certification activity occurred because the trend that training follows for the different sample groups compared to trends in other indicators will allow a valid understanding of the contribution of training to certification impacts. CMS has reported that based on their experience, it takes a minimum of two years after training to see any effect on yields. The end line survey will track training in the intervening years from baseline and look at changes in rates of training compared to other impact-level indicators to ascertain possible contributions of training to results. We will also track adoption of good coffee production practices which can occur more quickly than productivity improvements.

Economic findings at baseline

Coffee generates cash for low cash investment, but is not economically profitable

The farmers in the sample POs are very low cash input producers. For the 2013-14 production year, they generated average gross revenue ranging from USD 870 to 1117 per hectare from average expenditures of USD 110 to 154 per hectare or 13 to 15 percent of gross revenue, as Table 3.4 shows. Yields and prices that farmers received for coffee were significantly higher for the target group than for either control group, and as a direct consequence, revenue was significantly higher for the target group. The higher yield and prices also drove net income differences. Even though the target group had higher costs than either control group, net income was still significantly higher for the target group. Costs in this context are cash outlay items – fertilizer and pesticide purchases and paid labor.

According to farmer focus groups this revenue is especially valuable as it comes in a lump sum when school fees are due and when food needs to be purchased. However, coffee adds less than 25 percent to household incomes for any group in the sample. If accounting for the opportunity cost of family labor, however, coffee is not economically profitable for any sample group, particularly the target group which used almost twice as much family labor as the CMS control which was the lowest cost producer both overall and in terms of family labor.

Table 3.4 Yields, prices, and income

	Target	CMS control	Non-CMS control
Yield (kg gbe/ha)	537	458**	466**
Average price (USD/kg fresh cherry)	0.40	0.35***	0.36***
Coffee gross revenue (USD/ha)	1,117	870***	924***
Total coffee costs (USD/ha)	154	110**	134
Costs as a percentage of gross revenue	14	13	15
Coffee net income (USD/ha)	963	760***	789**
Opportunity cost of family labor (USD/ha)[32]	2,106	1,205***	1,573**

Possible difference in initial performance between target and control groups were anticipated in the difference in differences research design for this study. We will determine the impact certification of on sustainability by finding the degree to which at end line farmer performance improved (or declined) from this starting point. If at end line the quantitative results have sufficient power to attribute changes to certification, we technically will meet requirements for sufficient rigor in establishing attribution. However, given the few POs available as targets or controls, the quantitative methodology may not allow attribution. The mixed method, contribution analysis design accounts provides a structure for establishing attribution qualitatively. In addition, using qualitative and detailed quantitative information to complement each other in building a nuanced picture of the conditions facing certifiers may provide useful information to the implementers, funders and certification bodies.

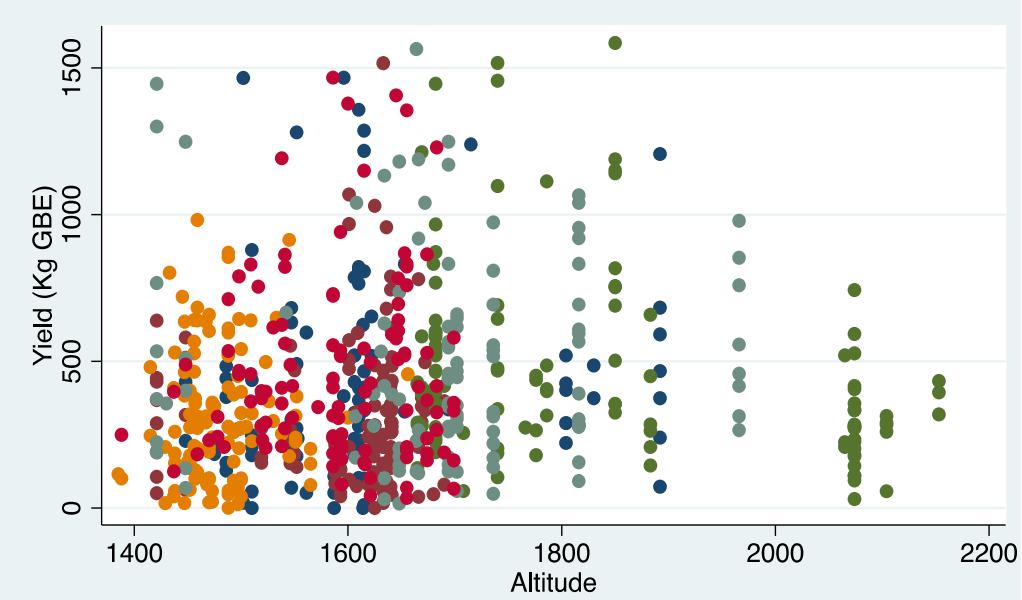
Yield lags potential

To provide insight into the effects of agro-ecological conditions on the yield results, Figure 3.1 shows each farm's yield arranged on a gradient of farm altitude. On Mt Elgon, altitude is a proxy for good agro-ecological conditions for coffee as these conditions – soil suitability for coffee, climate, and pests – improve as altitude increases. At every altitude range, a few farmers obtain much higher yields than other farmers within the range. This situation suggests that factors other than agro-ecological conditions are the main limiting factor for most farmers at this time.[33]

[32] Opportunity cost is the value of the household and other unpaid labor used to produce the coffee. We calculate it by multiplying days of unpaid labor times the typical daily wage for agricultural labor in the region.

[33] Individual farms could, of course, face limiting agro-ecological conditions such as locally poor soil or unfavorable slope. Such random variation is controlled for by the difference in differences design which will compare performance at end line against performance of the *same* farmers at baseline.

Figure 3.1 Farm yields by altitude gradient



Corroborating this conclusion, technical efficiency analysis shows farmers in the sample achieve only 50 percent efficiency from their coffee inputs. Technical efficiency relates to the ability to obtain the maximum output possible given a set of production factors and a given technology.[34] This analytical technique estimates a production function of coffee produced using inputs applied including the land allocated to coffee production; expenditures on fertilizers; pesticides and paid labor; and the valorization of family labor. We then estimate the deviations of each farmer from the most efficient ones. The result then expresses efficiency in terms of yields actually attained in the area, not against a theoretic or laboratory maximum. According to the analysis, on average, for the entire sample, farmers were less than 50 percent as efficient as their most efficient neighbor. Thus, at current yields, agricultural practices, rather than in agro-ecological conditions are limiting factors.

Coffee contributed less than a quarter of household's generally low net incomes

Given the small plots for coffee, efficiency levels and resulting yields, average total net income per household from all sources ranged between USD 1,303 for the non-CMS control and USD 1,69 for the target farms (significantly higher than the non-CMS control). Measured on a 'per household member' basis, the net incomes ranged between only USD 249 and USD 334 for the target with the differences between the two groups significant. Further, although according to farmer focus groups, coffee has an important role in household economies, arriving in lump-sums about when school fees are due, it comprises only 24 percent of total household income for the target group and 19 percent for both control groups, with the difference significant.

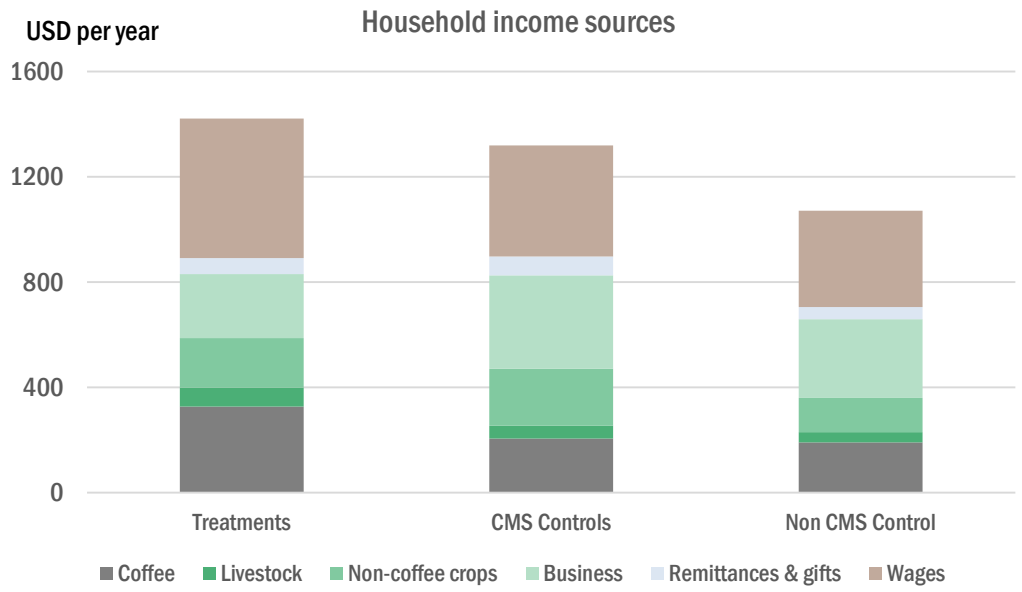
[34] See Appendix D for technical details on the efficiency analysis.

Table 3.5 Household net income

	Target	CMS control	Non-CMS control
Total household income (USD/ha)	1,691	1,656	1,303**
Total household income per household member (USD)	334	341	259**
Total household income (USD/ha farm area)	2,177	1,667**	1,995
Percent of net income from coffee	24	19**	19**

Figure 3.2 shows average annual incomes from all sources for each of the sample groups. The graph shows that the target group earns a lesser percent of income from other crops and a greater percentage from wages than either of the controls. For all groups, livestock and businesses make up a very small portion of annual income.

Figure 3.2 Average annual household income by source



High proportion of sample farmers live below global poverty lines

To explore the question of whether different types of farmers, such as those with different initial assets, poverty levels, or genders, experience differing changes in outcomes we looked at two different ways of identifying those whose circumstances might lead to differing outcomes:

- **Income-based poverty assessment**

  For income poverty, an individual is deemed as poor based on income compared to various poverty lines. Here, we looked at two different approaches of establishing income levels: 1) the Progress Out of Poverty Index (PPI), which uses sets of ten questions tailored to individual countries to estimate the

likelihood that households would fall under the poverty line; and 2) income poverty that uses data from the farmer survey questions which directly asked income from coffee, other crops and livestock production, wages, businesses, gifts and remittances and other. Measuring incomes allows comparison with various poverty lines which can benchmark income levels against various poverty lines. The PPI estimates the likelihood that household members will fall under the World Bank line for extreme poverty of USD 1.25 (2005 ppp). We also determined the percent of households in the sample that would fall under the national Kenyan poverty line of USD 22 per month; and USD 1.25, 2.50 and 3.10 per household member per day according to the direct method of measuring income.

- **Asset-benchmarked poverty assessment**
  Asset-based identification of households is formulated according to profiles of capital stocks (human and asset capital) households possess. We categorized farmers in the sample from questions in the survey that quantified their assets and then evenly distributing the households into five quintiles according to the asset score. This way of identifying farmers who may have different outcomes does not provide information about the level of poverty of the farmers compared to others. However, it does allow investigation into whether farmers starting certification with different levels of assets experience different results of certification.

Table 3.6 shows that all farm households from all sample groups are classified poor according to all of the poverty lines. According to the PPI (which is based on USD 1.25 (2005 ppp), more than 40 percent of households classify as living in extreme poverty. For the direct measurement of income, poverty rates were higher with around three-quarters of both target and CMS-control households having incomes of less than USD 1.25 per household member. The non-CMS control households had a significantly greater percentage under USD 1.25 per household member at 84 percent. Interestingly, while the CMS control had a significantly greater rate of poverty according to the PPI methodology, it did not have any significantly different rates than the target on methods using the direct measure of income against the higher poverty lines. Instead, the non-CMS controls had significantly greater rates of poverty than the target group measured against the Kenyan poverty line and the USD 1.25 line. For the asset-based measure, the CMS controls had a higher level of assets on average than the other groups, even though it had a significantly higher rate of poverty according to the PPI measure and similar poverty rates to the target on the direct income measures.

Table 3.6 Poverty measures

	Target	CMS Control	Non-CMS Control
PPI score[35]	41	44**	41
Measures using farmer reported income in the farmer survey data			
Percent poor against the Kenyan poverty line (USD 22/month)	66	67	73**
Percent poor against $1.25 per day	79	78	84*
Percent poor against $2 per day	88	86	88
Percent poor against $3.1 per day	93	92	92
Average asset scores (see Asset Category text box for further explanation)	2.7	3.4***	3.0**

While the two income approaches identify different proportions of poor farmers, the results on initial conditions and performance indicators show that poverty (regardless of the way it is measured) is a key determinant of the starting point of farmers and that this may imply a differentiated assessment for poorer groups. As Table 3.7 shows, farm and coffee areas consistently increase with income as do: the level of education of the farmer, percentage of farm households with little hunger, using two or more soil and water conservation practices, yields, net income from coffee and household net income. Also, farmers in different asset categories appeared to have different rates of fertilizer adoption. Table 3.7 also shows that generally fewer farmers in the poorer asset groups used fertilizers.

For asset quintiles, measures related to the entire farm-household show a similar pattern for farm and coffee areas, with farmer education, soil and water conservation practices, percentage with little hunger ascending and household net income ascending with assets. However, poor farmers have better coffee results with the poorer farmers having lower yields, but enough lower costs that their net coffee income is higher than even the farmers in the richest quintile. Since coffee accounts for 23 percent of household net income from all sources for the poor farmers but only 13 percent for the richest, the poorer farmers may have the strongest interest in producing good coffee incomes.

Finally, even though the poor farmers see some comparatively good coffee results, the coffee results do not bridge the total income gap with the richer groups having much higher household net incomes - five times more between asset group one and five. Given the fewer members for households in richer groups, net income per household member is also much higher.

Table 3.7 Farmer results by poverty classification

[35] Likelihood that households in the sample live on less than USD 1.25 (2005 ppp) per day per household member by percentage)

	Income compared to Kenyan Poverty line		Asset measure comparisons				
Indicator	Below	Above	Poorest	Poorer	Middle	Richer	Richest
Farmer characteristics							
Household members	6.5	5.0**	5.2	5.9	6.5	6.0	6.8
Education household head (years)	7.9	9.8	4.8	7.2	9.3	10.0	11.2
Total farm area (ha)	1.01	1.32*	.63	.82	1.0	1.2	1.9
Coffee area (ha)	0.26	0.34	0.22	0.21	0.31	0.31	0.38
Percent households female principal decision maker	33	28*	50	36	26	20	24
Sustainability indicators							
Percent households with 10 or more days of hunger	25	18**	35	31	23	15	10
Percent farms using at least two soil conservation practices	34	50***	26	35	37	44	53
Average price of coffee received (USD/kg gbe)	36.2	39.3***	38.7	38.1	37.1	34.7	37.1
Average yield (kg gbe ha)	458	555**	410	492	481	506	566
Cost (USD/ha)	100	212	87	99	130	136	215
Net coffee Income (USD/ha)	795	934**	741	917	836	827	896
Total net income	752	3,572**	732	978	1,340	1,774	3,129
Net income (USD per household member)	121	795**	184	201	272	378	555
Net income (USD/ha)	1,091	4,060	1,416	1,571	1,926	2,114	2,804
Percent total household income from coffee	25	10**	26	23	21	18	13

Low adoption of good coffee productivity practices

In focus group discussions – one group of 6-12 farmer members at each PO – members provided their understanding of possible reasons for different yields among farmers. Farmers concurred that while agro-ecological conditions played a part, other factors had a strong influence in the differentials currently seen. Table 3.8 shows the factors mentioned by at least five of the six focus groups as not always applied by farmers, but important. (See the Methodology section for details on the focus groups composition.)

All recognized good coffee production practices. Among other things, the list shows that the focus group farmers were aware of practices that improved coffee production.

Table 3.8 Farmer focus group perspectives on coffee production factors

Factors noted in at least five of the six farmer focus groups as most important to coffee yields
Synthetic fertilizer use
Weeding
Pruning
Manure use
Spraying for pests and diseases

Source: Appendix H, Table 5

The total coffee costs from Table 3.7 above suggest that practice adoption might be low since total cash outlay costs represented no more than 15 percent of gross revenue for any sample group (though when opportunity cost of unpaid labor is taken into account, coffee farming is not economically profitable). This implies that investments in production practices are not high.

Table 3.9 gives deeper insight into cost patterns, showing that when average across only farmers adopting the use of the item, average costs per farmer are similar that target farmers spend more than control farmers on these items only when averaged across all farmers in the group. The costs appear higher from the target group when average across all farmers in the group because of the higher rate of farmers using the practices.

Figure 3.3 combines information on adoption of cash intensive investments – fertilizer and pesticides – with information on adoption of time-intensive practices – pruning and weeding. The percentage within sample groups of farmers adopting synthetic fertilizer and pesticides was under 50 percent for all groups and as low as 25 percent. However, the intensity of use as indicated by cost per hectare among farmers adopting these practices was similar across sample groups.

The percentage of farmers weeding their coffee exceeded 95 percent but the intensity of weeding was low as indicated by average weeding scores ranging from 2.4 to 2.8 out of 10. Weeding score reflected primarily frequency of weeding, with an adjustment to allow for use of herbicides to count for multiple weedings. The percentage of farmers pruning ranged from 43 to 60 percent, but average intensity was also low with the highest average score at 17 out of a possible 110.

The pruning score reflected whether farmers simply removed small branches, shaped the tree by reducing the number of main branches, desuckered and engaged in periodic cycle change (revitalizing production from trees by cutting them off at ground-level and then allowing them to regrow). While intensity of use was similar for each practices for the farmers engaging in it, a greater percent of farmers in the target group used each practice than control group farmers. The similar intensities may give further evidence that many farmers know what to do, but still farmers do not always translate their knowledge into action.

At baseline, we are only observing conditions – yields and rates of practice adoption in the sample group, for example. Only at end line, with the data from a second point in time, can we evaluate if these practices contributed to increased net income (through increased yields) and if under certification there was increased practice adoption that appeared to lead to increased yields. A more robust understanding of the specific influences affecting the degree of practice adoption will occur at end line.

Table 3.9 Fertilizer, pesticides, and labor

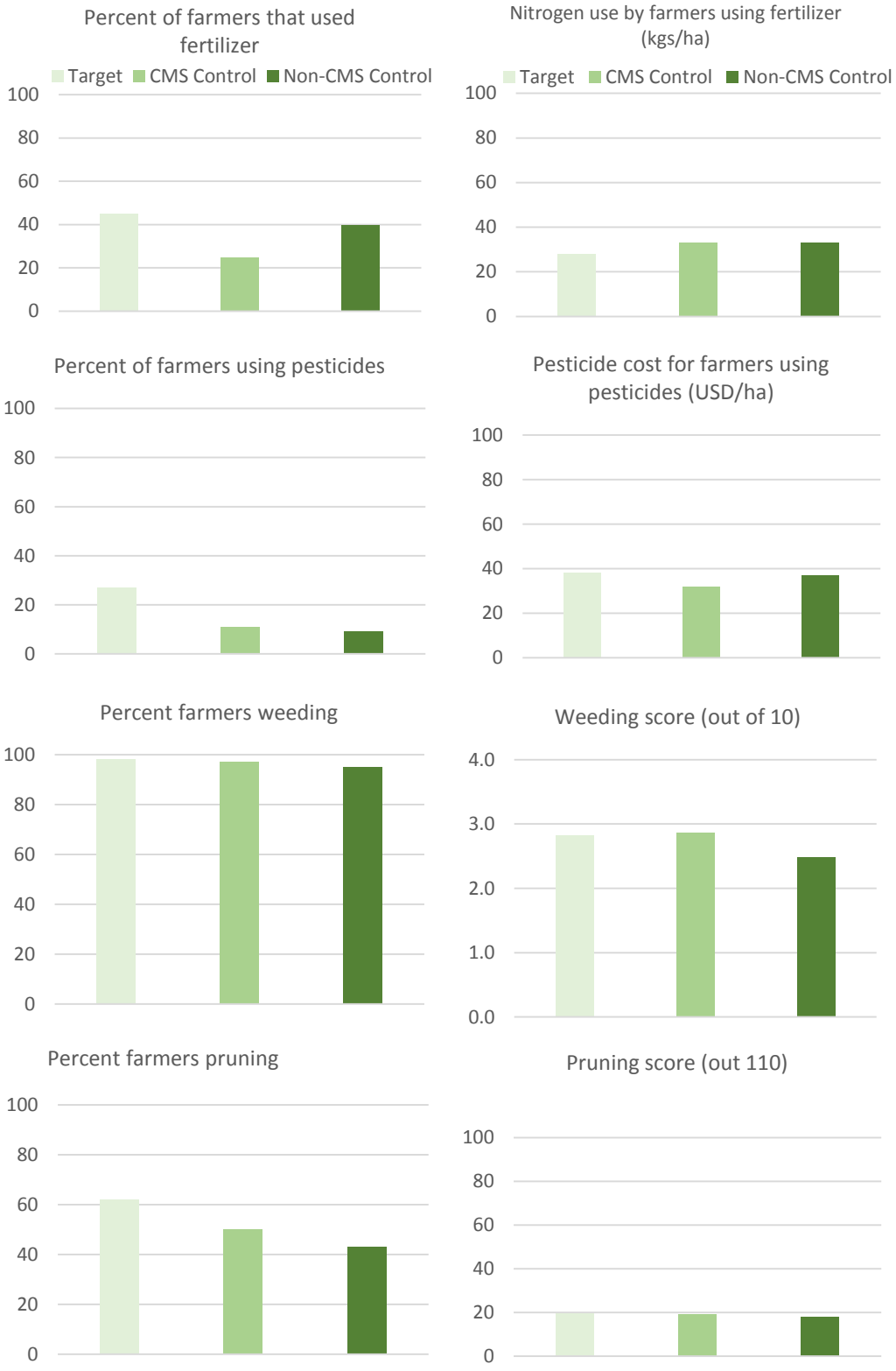
	Target	CMS Control	Non-CMS Control
Percent of farmers that used synthetic fertilizer	45	25***	40
Fertilizer cost averaged only for farmers using fertilizer (USD/ha)	171	159	154
Nitrogen use averaged only for farmers using fertilizer (kg/ha)	28	33	33
Percent of farmers that used pesticides	27	11***	9***
Pesticide cost averaged only for farmers using pesticides (USD/ha)	38	32	37
Percent of farmers that used paid labor	63	38***	37***
Labor cost averaged only for farmers using paid labor	213	196	209
Percent of farmers that used family labor	100	99	100
Opportunity cost of family labor (USD/ha)36	2,106	1,205***	1,573**
Total labor cost - paid and opportunity (USD/ha)	2,223	1,276	1,647

In addition to investing in practice adoption at a greater rate which translated to higher group costs for fertilizers and pesticides, target farmers also used more total labor than either control group as indicated by the amounts paid and the opportunity costs of household labor.

Figure 3.3 – Comparisons of rate of adoption of good coffee production practices and intensity of adoption

Percentage use **Intensity of use**

[36] Opportunity cost is the value of the household and other unpaid labor used to produce the coffee. We calculate it by multiplying days of unpaid labor times the typical daily wage for agricultural labor in the region.



R
p
th

The farmer focus groups and key informant interviews provided insight into why farmers may not adopt practices even when they are aware that they could be beneficial. , Practice adoption is a complex decision in which multiple factors interacting may determine if a practice is adopted. As a very simple example, farmers could attend

training on fertilizer and want to adopt its use, but the fertilizer must be both available in the region and affordable. If it is not, training will appear to have no effect. Determining the interrelated contributions of the factors cannot occur until end line when the correlations in changes among factors may provide answers to the practice adoption puzzle. Even then the interrelationships among factors could make definitive answers elusive. Still, characterizing practice adoption now according to factors farmers and other knowledgeable informants identify will help attribute impacts at end line.

In at least five of six farmer focus groups farmers identified that the following factors contribute to low practice adoption:

1. Low and volatile coffee prices
2. Competition for resources within the household
3. No price incentives to farmers for superior quality coffee
4. Distrust throughout the coffee sector
5. Low perceived value of PO services
6. Credit is available but farmers report lack of access as an impediment to adoption
7. Lack of (or inadequate) training

1. Low and volatile prices raise concerns that investment in practice adoption may not be profitable

All of the focus groups said poor prices discouraged investment in productivity practices. This reflects reasonable business decision-making – not to spend on production if there is a significant risk that sales prices will not cover the costs. Aside from the sample farmers generally perceiving prices are poor, they are also subject to the worldwide volatility of coffee prices, making them hard to predict from year to year. Thus, while investing in various good agricultural practices would be a good decision in some years, in others, such investments would not be profitable. A CMS representative confirmed the relationship between prices and adoption of fertilizer, noting that reasons for different rates of adoption among farmers in different POs may arise because farmers will use fertilizers if their PO is paying a good price.

Table 3.10 suggests that farmers' concerns about profits are justified given that even at today's low levels of practice adoption, fewer than 54 percent of farmers said they earned profits in all of the last three production years and fewer than 30 percent saying they earning profits in all years.

Table 3.10 Farmer profit from coffee production

	Target	CMS control	Non-CMS control
Percent farmers who say coffee farming was:			
Profitable in all of the last three years	24.9	29.9	23.4
Profitable in some of the last three years but not in all	63.3	53.9**	63.2

It is possible that the Fairtrade price premium and floor could help mitigate this uncertainty. However, various informants have suggested that the coffee from this certification project will likely not be sold as certified. Instead, price improvements from quality improvements are expected to give farmers a justification for investing in practices that will bring better prices. At end line we will explore the hypothesis that higher prices lead to greater practice adoption. We will also note whether the target PO's coffee got sold as certified and if the Fairtrade minimum contributed to maintaining profitability. Confounding factors to this determination of the contributions include that investing in practice adoption can lead to higher prices.

2. Farm households face competition for money and time resources. This may underscore the need for business literacy

Focus group participants from five of six of the POs said that many would choose to invest resources in other crops that they believed produced better (and more immediate))[37] returns than coffee. Other farmers needed resources, including sometimes credit to pay school fees or for food during the 'hunger months. As a result, farmers chose between investing resources for good coffee practices and using them on other needed items; this competition for resources was viewed as contributing to low yields in coffee. For maximizing benefits from their land, labor, and financial resources, farmers should use resources on the crops that will give the best return, especially given that farmers in the sample earned nearly as much net income from other crops and livestock as from coffee (see Poverty section).

A difference that was noted at baseline that is related to the competition for resources is that farmers without resources adopt practices at different rates. As figure 3.4 shows, the poorest groups showed the lowest rates of practice adoption, both for practices requiring cash outlays and for pruning which requires time. Figure 3.5 shows that with farmers in higher income and asset groups having incomes sometimes several times the farmers in the lower groups, the better off farmers likely have more ability to purchase inputs or hirer labor to do time consuming tasks.

[37] All the sample POs said that they took longer than a month after delivery to pay farmers for their coffee due to the time taken for funds from auction sales to be remitted to them. Farmers' investments in most good practice occur months before coffee delivery.

Figure 3.4 Percentage of farmers adopting practice

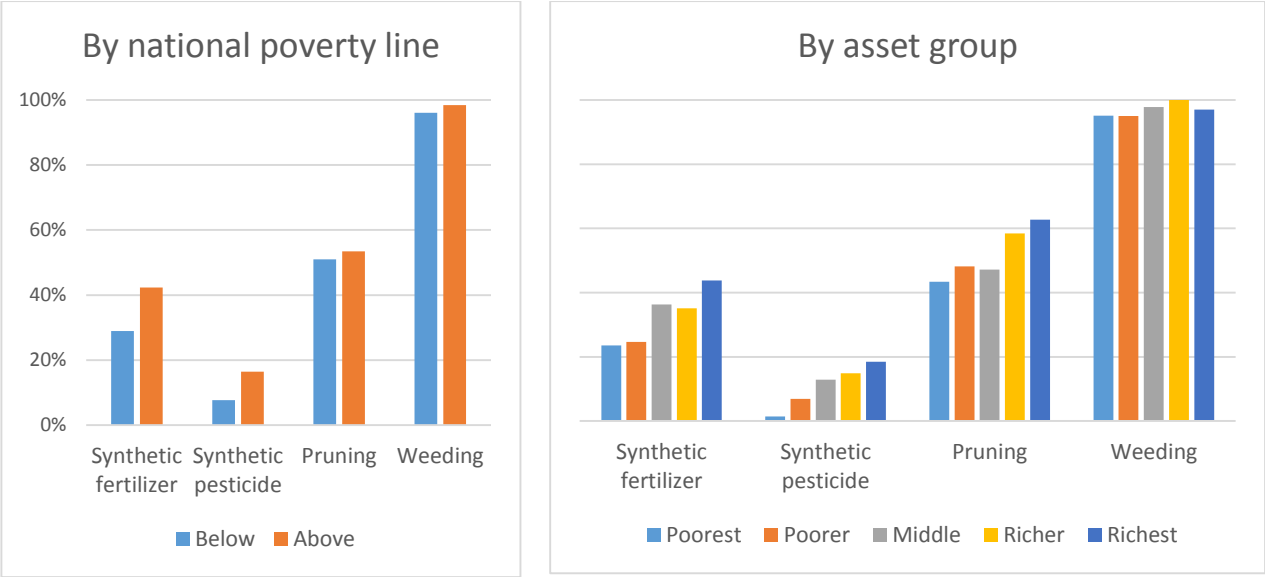
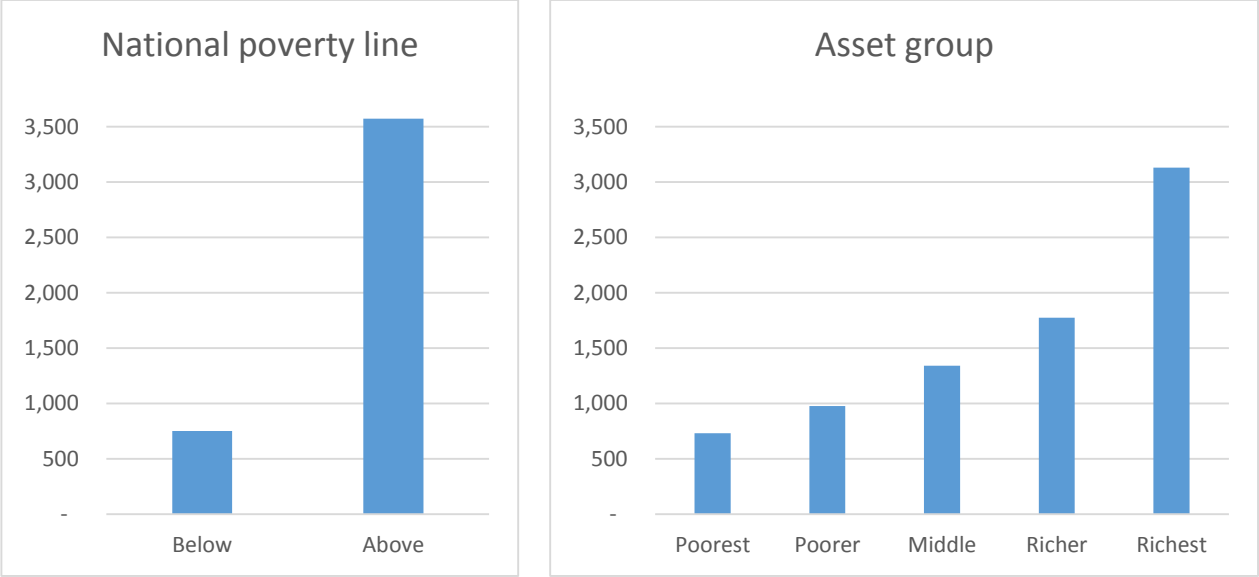


Figure 3.5 Total household net income



Further, some PO leadership expressed concern with the decisions they believed some farmers were making to use resources for crops other than coffee. They suggested that farmers' analyses about the relative profitability of crops other than coffee might be clouded by the faster returns of other crops compared to coffee, rather than accurately understanding the true profitability of each. The PO leaders also maintained that farmers too often focused solely on price without recognizing that they could improve revenue by increasing yields through adoption of good practices. Farmer survey data suggested that farmers may not have the records to make such assessments nor have they received training in making such assessments. As Table 3.11 shows, only 26 percent of target

farmers kept records on only 12 percent of non-CMS control farmers, while virtually no farmers had received training on business management.

Asset categories – Farmers at different starting points

From the farmer-household survey, we selected a set of key variables by which to characterize asset levels of farmers in the sample. By using Principal Component Analysis (PCA) on this set of household and farm-level characteristics, we were able to create an "asset category" typology of farmers that we used to understand farmer actions at baseline and will use to identify differentiated impacts of standards systems adoption at end line.

The set of physical and human capital assets used in constructing the asset groups were: farm size, tropical livestock units (TLUs), school grades completed by household head, number of small farm equipment and vehicles owned, number of habitable rooms, electricity in the home, and possession of other household assets: radio, TV, telephone, refrigerator, bicycle, motorcycle, automobile.

Comparing the asset categorization to PPI scores showed that farmers in the highest asset category also had the highest average likelihood of being in extreme poverty while farmers in the lowest asset category had the lowest average likelihood. In this report, "poorest" refers to farmers with the lowest asset values while richest refers to those with the highest values.

Table 3.11 Farmer record keeping

	Target	CMS Control	Non-CMS Control
Percent of farmers keeping records	26*	20	12
Business management	0	1	0

At end line, we will check whether training in record keeping in business management increased. We will also see if this increase was accompanied by actual changes in record keeping as well as changes in the balance of coffee with other crops and livestock and changes in the time from delivery to payment, and then ultimately compare any such changes to changes in household net income.

3. No farmer price incentives for quality, importance of follow-up to practice adoption

The prices for which coffee sells at the Kenya national auction are often driven by the quality factors of grade and cup profile. Thus, the prices that a PO receives starts with the quality that farmers deliver to their POs. At the end of the selling season, the POs determine a single amount per kilogram to pay all the farmers who delivered coffee. By law, this amount must be a percentage of what the PO received, but no less than 80 percent. Therefore, the price farmers receive is directly related to the overall quality of the PO's coffee as delivered to the Nairobi auction by the marketing agent.

In the farmer focus groups, farmers said they were aware that the prices that their PO receives are correlated with quality, and that their own good farmer practices influenced that quality. However, in at least five of the focus groups, the farmers said that because all coffee is delivered into a single processing stream with the coffee from all other PO members with no provision made for price differentials, it dampens farmers' willingness to make extra efforts to improve quality. They thought that with no quality differential, they would likely not see a return on the investments they made in adopting practices for improved quality because other farmers who did not make such investments would keep the quality low.

According to key informants, such assessments about whether to invest in adoption of good practices has the same weakness as discussed in the previous section: farmers make decisions solely on price without taking into account the revenue potential from increased yields. According to more than one informant, in this setting with very basic quality issues, the same practices that improve quality would also improve yield. Therefore farmers have an incentive to not invest in quality because the price they receive may not cover the investment. However, without the investment, prices could continue to fall due to lack of quality and thus depress investment further.

Without some form of follow-up with farmers to reinforce use of resource intensive practices, this feedback loop could lead to continuing downward pressure on investment in practice adoption. Focus group farmers, PO management and other knowledgeable informants all mentioned that such a follow up system could help. A CMS representative mentioned as a prime motivation for pursuing certification that it does help to continuously re-inforce the use of good practices rather than relying solely on training.

Reinforcement, accountability key to ensuring quality and investment in good practices remain high

Concern about lack of follow up with farmers to ensure use of good practices came up in the farmer focus group discussions at all six coops. Many farmers made reference to the supervisory role government had played in the past in ensuring high quality coffee. Some mentioned feeling demotivated by the inelasticity of price received, regardless of quality. Ensuring better accountability and greater transparency (through more open and democratic POs) could be one way to mitigate farmer malaise.

Cooperatives were also aware of the problem. Coop board members mentioned the issue at the majority of the six coops. Some suggested having distinct days where 'high quality' and 'low quality' product was sold in order to ensure that 'high quality' farmers were rewarded. The idea is predicated on the notion that implementing such a system would encourage 'low quality' farmers to adopt better practices. Finding ways to increase supervision of farmers and re-inforce all farmers in cooperative working to improving the coops' overall quality so all farmers would get a better price to reward their efforts was also mentioned by several of the value chain actors.

In sum, reinforcing the importance of good practices (whether through government actors or great PO accountability) is key to ensuring that quality and investment in practice adoption remain high.

4. Distrust across coffee sector

In key informant interviews and farmer focus groups, distrust among actors in the value chain permeated discussions – from POs and others indicating that some farmers laced their coffee deliveries with stones to increase its weight, to farmers believing that upon election, PO board members began to skim farmer money, to POs believing that marketing agents somehow managed to take more than their fair share of revenues from sales at auctions. Farmers in particular mentioned lack of trust in their PO management or marketing agent to make good decisions as a discouragement to investing in practice adoption. Further, according to the coffee marketing agent, board composition of coops in this area is often unstable due to frequent replacement of board members, a factor which precludes long-term planning and deters marketers from investing. The marketing agent suggests this turnover impacts overall trust because ousted board members often conduct acrimonious campaigns against the new board members in the next election – leading to increasing turn-over and ever higher levels of distrust. Farmers said that lack of trust in PO management decreased farmer confidence about whether they could rely on receiving reasonable returns from investing in coffee production.

Farmers expressed concern in both focus groups and the producer survey about POs acting in their best interest. Indeed, fewer than 50 percent of farmers in the sample thought that their PO always *or even sometimes* acted in their best interests. They also expressed concern about transparency of determination of the price farmers received for their coffee, and about the value of services their POs delivered. Taking into account the Fairtrade theory of change for strong POs, we also examined indicators from the COSA PO survey for open, democratic and inclusive POs as improving these attributes seem that they would contribute to building trust.

Beyond their uncertainty about investing in good coffee production practice because of world-wide price volatility, farmers also are uncertain that their POs deliver prices that match the quality of the coffee the farmers deliver. This uncertainty stems from concerns about PO management's training, competence and intention. Uncertainty about receiving merited compensation spills over from concern with the POs to the sector generally.

Lack of price transparency undermines trust

Further, evidence suggests that the lack of price transparency further undermines trust. A major factor in concerns about POs is lack of understanding of how prices are calculated. As Table 3.12 reveals, nearly two-thirds of farmers said they never understand how price is determined. As a result, they are not sure that the market pays fairly.

Table 3.12 Understanding of coffee prices

	Target	CMS Control	Non-CMS Control
Percent of farmers who never understand how the price they receive is determined	66.5	65.6	65.7

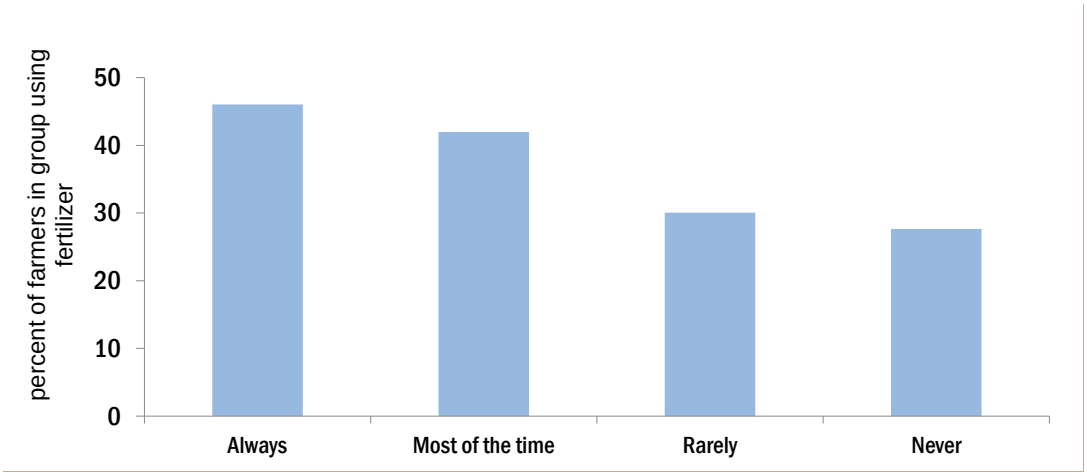
Further, farmers at all six POs showed deep concern with lack of price transparency. This needs more investigation, however, since there is a slight tendency for lower asset farmers to have less trust.

Table 3.13 How better understanding of pricing would affect investment in coffee production

Targets	
PO A – Participants in the PO A focus groups did not indicate concern about price transparency	**PO B** Farmers would be happy to know how prices are calculated. They would then not have doubts about returns. It would contribute to increased investments in coffee
CMS control	
PO C - If farmers knew how price is arrived at, they would then accept the price without protest, and would then be able to think about improving.	**PO D** If there was transparency in price calculation, the farmers may invest more in coffee.
Non-CMS control	
PO E - Farmers said it would be good if management understood how prices are arrived at. They would then communicate this information to farmers.	**PO F** Farmers want to be involved in marketing.

Conceptually, these concerns could increase farmers' uncertainty about the benefits that might accrue from adoption of good practices, particularly fertilizer and pesticide use, and thus reduce such adoption. Data from the farmer survey as well as additional information from the focus groups suggest that the concept is a factor empirically. As reported above, a minority of farmers perceived that their POs always or sometimes acted in their best interests. Figure 3.6 shows that farmers who said POs were less likely to act in the farmers' best interests use less chemical fertilizer**.** About 28 percent of farmers who reported that the cooperative "Never" acted in their farms' best interests when making decisions used fertilizers compared with 46 percent in the "Always" group.

Figure 3.6 Trust and use of chemical fertilizer



Open and democratic POs

As an additional factor potentially affecting trust, we looked at indicators of open and democratic processes, as well as of inclusive participation. In the Fairtrade Theory of Change (see Appendix X.1) the concept of enhanced democracy, participation and transparency is an output connected with the outcome of strong and inclusive POs. According to farmer focus groups, there seems to be evidence to suggest that open and democratic POs might also have a role to play in accountability and follow-up regarding practice adoption.

As Table 3.14 shows, all the POs hold general meetings and publish bylaws, as required by Kenyan law. The percent of available communications channels used – a proxy for the effort that PO leadership makes to inform farmers - varies among the POs, but is still low across the board with the highest at only 30 percent. The bottom row of the table is the "democratic processes and transparency index." This index allows a look at how the sample POs rank in comparison with each other on the indicators of democracy and transparency in aggregate. (For more explanation about indices, see the section below "Role of POs" under Vital Observations.) One target POs ranks lowest on this index while the other is in the lowest third of the POs. The target sample group, however, has significantly higher yields and coffee income.

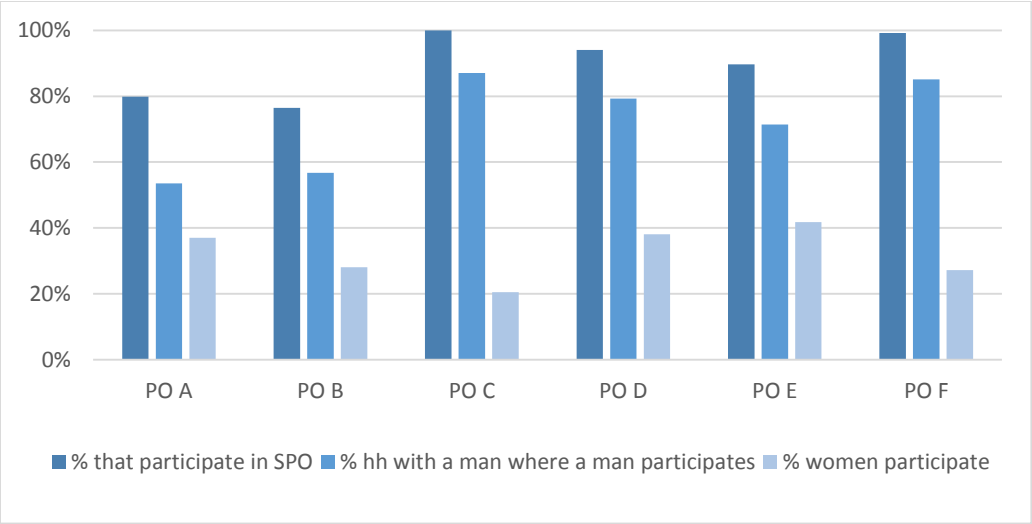
Table 3.14 Indicators of open, democratic POs

Attending always or sometimes (%)	0.59	0.49	0.58	0.73	0.70	0.62
Hold general meetings	1	1	1	1	1	1
Have published bylaws	1	1	1	1	1	1
% of 10 potential channels for communicating with members that the PO uses	0.20	0.10	0.40	0.10	0.20	0.30
Democratic processes and transparency index	0.83	0.73	0.95	0.81	0.86	0.90

Figure 3.7 shows measures of inclusive participation, including rates of overall participation by all members, by men and by women. Inclusive POs also seem more likely to engender trust among members. The figure shows the percent of households

that report someone participates in their PO, the percent of households with men with at least one man reported to participate in the PO and similar measurement for women.

Figure 3.7 Overall, male and female percent participation in producer organizations



For overall participation in their POs, note that this indicator reflects the same pattern as the democratic process measures of the target POs having the lowest rates of overall farm household participation while having the highest yields and net coffee incomes. Member participation in target POs was around 75 percent, while control groups had participation rates at 90 percent or higher. Rates of men's participation followed this same pattern exactly, but the pattern of women's participation differed. For example, PO C and PO F with the highest rates of overall and men's participation have the lowest rates of women's participation. The target POs, while having the lowest rates of men's participation have among the highest rates of women's participation. Women participated across the board at a lower rate than men. Even for PO E, the highest ranked on the index, in only 42 percent of households with women did women participate in the PO, 70 percent of the men's rate. Within PO C (CMS control), only in 21 percent of households with women did women participate in POs, a quarter of the men's rate.

At end line, we will explore how POs changed on the indicators of democracy and participation and compare with changes in trust. We will then continue along the causal chain, looking at relationships between trust level and practice adoption and final changes in impact-level indicators for farmers. Also, we will continue to look for other indicators that will provide stronger insights into the PO strength, how to measure it and how it relates to farmer performance. We invite collaboration on developing this tool with ISEAL and its members.

5. Farmers do not perceive good value from PO services

A value of POs is that transaction costs for services can be lower when spread across all members than if each member acquires services individually. These services can be particularly useful in remote settings where acquiring inputs and credit can be difficult. According to the PO Survey, all the sample POs provide the services listed in Table 3.15 below. Sample farmers also indicated in farmer survey questions the PO services that they said contributed to their farms. The farmer survey results showed that for every

sample PO at least some farmers acknowledge a contribution from services that the POs said that they offered. Table 3.15 shows, the percentage of farmers in each PO for each of the listed services reporting that it contributed to their farm. The top, light blue row shows the average percentage for all services offered by the PO that members found contributed to their farm.

The target POs ranked lowest at 15 and 17 percent while one CMS and one Non-CMS control ranked highest, but still only at 27 and 30 percent of members finding the service useful. Other than selling services (which is the essential function of Kenyan POs), the percentages of farmers finding their PO contributed to their farm fell below 20 percent and for many services it fell below 10 percent. The average of the percentage of farmers who found services valuable was low reflecting the low 'value' attributed to each specific service.

Table 3.15 PO services offered to farmers

	Target		CMS control		Non-CMS control	
	PO A	PO B	PO C	PO D	PO E	PO F
Percentage of PO services that farmers valued	15	17	18	27	30	17
Selling services	73.1	68.6	99.2	76.3	69.8	96.6
Support to get credit	10.1	16.9	11.7	60.2	41.4	5.0
Inputs	10.9	24.6	16.7	22.9	46.6	13.4
Processing services	4.2	5.9	0.0	9.3	19.0	0.0
Support on environmental activities	2.5	5.1	0.0	4.2	9.5	0.8
Technical assistance	4.2	2.5	1.7	3.4	6.0	2.5
Coffee planting materials	14.3	8.5	7.5	16.9	20.7	12.6
Information on input providers	4.2	5.9	3.3	24.6	25.9	1.7

Source: Appendix E.1

6. Credit available but farmers report lack of access as impediment to practice adoption

Two of the services the all the sample POs offered – credit and inputs – were mentioned in at least five of six farmer focus groups as factors in adoption of good coffee production practices.

The practices with the lowest adoption rates are those requiring cash outlays (synthetic fertilizer and pesticide use), corroborating the idea that farmers need financial support to adopt these practices. However, fewer than 21 percent of farmers in any sample group appeared to not be able to obtain credit. If credit were a limitation to using synthetic fertilizers, then we would expect this number to be close to the percentage of farmers not using synthetic fertilizer. However, 55 percent of farmers reported using no synthetic fertilizer, much higher than those who had no access to credit. This suggests that limited credit availability cannot be the sole determinant of fertilizer use. Also, for credit, 60.2 and 41.4 percent of farmers in the control POs reported a contribution, while only 10.1 and 16.9 percent reporting so for the target POs.

For providing inputs, one of the non-CMS controls stood out with 46.6 percent of farmers reporting the service contributed to their farm. A target PO was the next closest, still 20 percentage points below. The other target PO had only 10.9 percent of farmers say that its input services contributed to their farm compared with control groups.

It is important to note that the PO leadership found offering credit particularly challenging. Each PO indicated that some farmers make collecting loan repayment very difficult. While the system was set up so that the POs could collect payment out of the proceeds owed to a farmer for their coffee, some farmers owing money would sell to a different PO at the time of harvest. In the focus groups, farmers expressed frustration that when this happened, the farmers in the PO that advanced the credit would end up having to cover the lost amounts due to higher operating expenses that were then deducted from payments for their coffee. According to CMS, some POs in other regions have begun collecting loan payments for each other to solve this problem.

At end line, we will look at whether POs found solutions for improving collection of loans and if the percentages of farmers that found PO services valuable (particularly vis a vis credit and inputs) increases and determine if such increases track changes in practice adoption, yield and income. Finally, we will be look for evidence of (networking for theory of change) as highlighted in the Fairtrade theory of change for POs.

7. Lack of or inadequate training

Finally, five of the six focus group discussions mentioned lack of adequate training. This is an interesting result, given the farmers' strong self-reported awareness of the practices important to coffee production. According to the literature on practice adoption, an overarching consideration for farmers in adopting a practice is whether the benefits of adoption will outweigh the costs. Farmers' decision-making processes take into account perceived risks to deriving benefits from the practice. Among other factors, farmers feed into their decisions about practice adoption, evidence they see around them of practices working for others, and their assessment of if they have enough knowledge and skill to make a practice successful enough to justify the cost of its use.

Empirical evidence suggests that training using multiple channels increases the probability of practice adoption. This suggests that certification implementers could investigate whether delivering training through multiple channels such as demonstration plots, promoter farmers, model farmers, formal classroom-type settings and farmer field days could enhance adoption. Also, to ensure that farmers do see evidence around them of practices working, recommendations for types, quantities and methods of input application must be fully suited to local conditions. According to the director of the CRI, some interventions have imparted incorrect information for the Mount Elgon area.

Social findings at baseline

As would be expected with the poverty and income profiles in this region, many of the households in the sample faced challenging conditions, from lack of food security to schooling to access to water.

Food security

A day of hunger is one in which a person skipped or reduced their normal intake of

healthy food because they could not acquire a sufficient amount. More than 36 percent of each group had some hunger days during the 2013-2014 production year (see Table 4.1). The percentage of households with more than 30 days of hunger ranged from 5.5 to 12.4 percent.

Table 4.1 Food security

Percent households by range of hunger days	Target	CMS control	Non-CMS control
< 9	82.7	74.3	76.1
10 - 29	11.8	13.3	12.1
30+	5.5	12.4	11.7

Ventilation

This indicator has its basis in the professional literature on family health in developing countries which finds that girls, women, and young children who are continuously exposed to indoor cooking smoke have a much higher incidence of serious health issues, including respiratory diseases and ocular problems. Having adequate ventilation is a global proxy for quality housing and for general family health.

In no sample group did more than 40 percent of households have ventilation for cooking areas when smoky cooking fuels were used.

Table 4.2 Kitchen ventilation for smoky fuels

	Target	CMS control	Non-CMS control
Percent households that had ventilation	32.5	40.8*	39.5

School achievement

Education is a basic human right recognized because of its importance to people being able to fully develop potential capabilities and livelihoods. Measuring whether children are at the grade level appropriate to their age indicates if they have been able to realize that right. As depicted in Table 4.3, fewer than 60 percent of primary school aged children (6 to 14 years) in any sample group were at grade level for their age, with fewer than 41 percent of secondary school aged children (15 to 18 years) at grade level. A maximum of 61.4 percent of children from any sample group lived in households within 30 minutes of school, another 11.8 to 12.1 percent lived between 30 and 60 minutes from school, and 0.4 to 3.4 percent lived more than 60 minutes from school.

Table 4.3 School achievement and distance to school

	Target	CMS control	Non-CMS control
Percent children at appropriate grade for age			
Percent of children (7-15 years) in appropriate grade level	65.6	67.3	61.7
Percent of children (16-19 years) in appropriate grade level	40	33.7	28.2**
Percent households by minutes to school			
Fewer than 30	63.7	61.4	65.3
30 – 60	23.6	23.2	27.6
More than 60	3.4	1.7	0.4

Drinking water

Drinking water available to farm workers provides insights into general working conditions. The percentage of farms with good water availability – workers who could obtain water within a five minute walk from their work site – ranged from 47 to 66 percent. The percentage with workers having poor access to water – workers had to walk 20 minutes or more – ranged from 9 to 23 percent. Further, household members particularly those in the CMS control group faced more difficult water conditions than workers, with the percentage of farm households within a five minute walk for water ranging from 18 to 64. The percent of for households where members had to walk more than 20 minutes for water ranges between 13 to 37 percent.

Table 4.4 Water availability

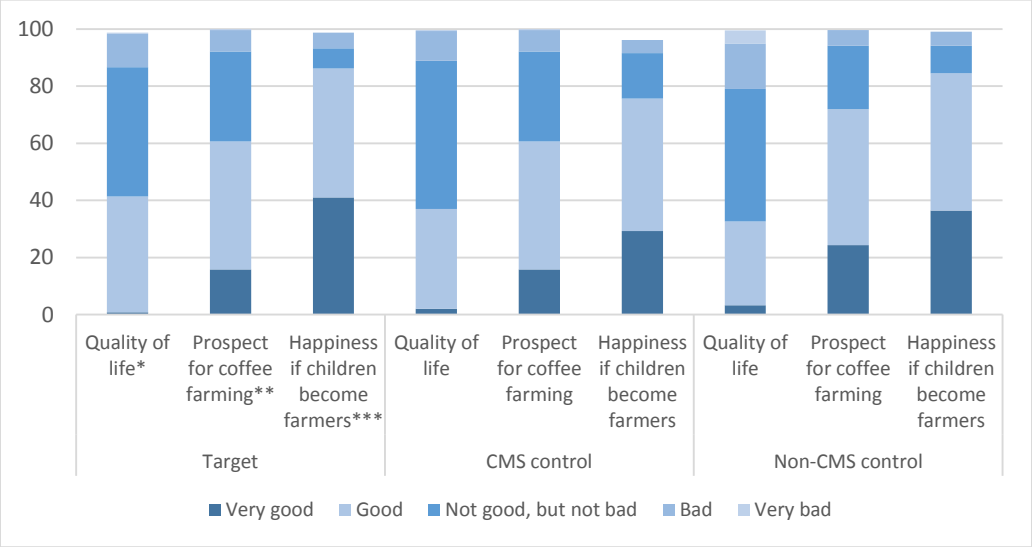
	Target	CMS control	Non-CMS control
Percent farms by minutes workers walk to obtain drinking water			
Fewer than five	66	47	66
5 to 20	24	30	26
More than 20	9	23	9
Percent households by minutes members walk to obtain drinking water			
Fewer than five	64	18	52
5 to 20	22	45	34
More than 20	13	37	14

Social perceptions

As might be expected for farmers facing the challenges articulated above, many

perceived that life could be better. As Figure 4.1 shows, fewer than 42 percent of farmers in any group said quality of life was good or very good[38], while the percentage reporting that quality of life was bad or very bad ranged from 10.8 to 20.5 percent. Less expectedly, within every group, a higher percentage of farmers thought coffee farming had good or very good prospects than the percentage experiencing quality of life as good or very good. The percentage viewing coffee farming favorably ranged from 72.0 to 75.7 percent. Finally, within every group, an even higher percent of farmers said they would be happy if their children chose to become coffee farmers than those saying coffee prospects were good, with the percentage of those saying prospects would be good or very good ranging from 60.6 to 86.2 percent. These results suggest that coffee farming may not be the primary influence over perception of quality of life.

Figure 4.1 Farmer perceptions of their circumstances - Percent farmers by ranking



***** = Target different from non-CMS control for "good" at p<0.05
** = Target different from CMS control for "very good" at p<0.05 and "not good, not bad" at p<0.01
*** = Target different from CMS control for "very happy" at p<.05 and "not good, not bad" at p<0.01

Environmental findings at baseline

Measuring the percentage of farmers using practices for soil conservation and plant water use improvement indicates whether farmers are taking reasonable care to prevent soil erosion, maintain soil structure, and promote water percolation. Practices covered by the survey were: drainage channels or diversion ditches for water runoff, soil ridges around trees, live or deadwood fences, shade trees, hedgerows and any others that the farmer listed. A reasonably high percentage of farmers in the sample used at least one practice for conserving soil and improving plant water use. The percentage nearly halved, however, for farmers using at least two conservation practices, with a significantly higher percentage of target farmers than control groups using at least two. The target group also has a significantly higher percentage of farmers than the control group using at least

[38] The question presented to farmers was: 'Would you say overall quality of life for the household in the last production year was…' Answer choices were: very good, good, not good but not bad, bad, very bad.

three practices. More than a third of sample farmers use water catchments to conserve water in addition to those farmers improving water usage.

Perceptions of environmental care seemed tempered with more than 54 percent of the sample saying that the community exercised fair or poor care of the environment. Fewer than five percent of farmers thought that the community took very good care of the environment. For the target, slightly more than a third thought care was good, significantly lower than the 43.5 percent of non-CMS control farmers.

Table 5.1 Environmental conditions

	Target	CMS control	non-CMS control
Soil conservation and measures to improve water use - Percent farms using			
1 or more practices	80.8	76.8	71.1**
2 or more practices	47.7	33.6***	32.2***
3 or more practices	18.4	10.4**	14.2
Water conservation measures - Percent farms using			
Water catchments	37.7	33.6	33.9
Community care of the environment - Percent that say community takes[39]			
Very good care of the environment	3.8	1.2	0.8
Good care of the environment	35.6	29.9	43.5*
Fair care of the environment	46.0	51.5	42.3
Poor care of the environment	13.4	17.4	12.6

[39] The question presented to farmers was: 'Would you say the community's level of care for the environment in the last production year was…' Answer choices were: very good, good, fair, poor and very poor.

Vital observations

Role of POs

Creating needed tools

Producer organizations (POs) are key actors in both the Fairtrade and UTZ theories of change. Fairtrade certifies POs rather than farmers based on the idea that POs are the catalyst for creating sustainable change for farmers. Similarly, UTZ focuses on strengthening PO capacity and improving their services to farmers as a means to improve farmer livelihoods. This section describes baseline conditions for the target and control POs which in Kenya are organized as cooperative societies authorized by national law.

Key research questions related to cooperatives –

To be answered at end line

What are the changes that occur at the farm, household, and cooperative level leading up to certification to the combined Fairtrade and UTZ standards and again after three years of certification?

Can any observed changes in farm and cooperative performance be attributed to the combined Fairtrade and UTZ standards?

What added value do Fairtrade and UTZ standards bring to cooperatives?

What contextual factors can significantly influence the effect of Fairtrade and UTZ on PO performance?

A tool structured to reflect the Fairtrade and UTZ theories of change is needed to characterize PO strength and relate them to farmer change. This inaugural work is intended as a working model of a tool that will facilitate learning that stakeholders including COSA, ISEAL and the standards systems among others can continue to collaborate on for characterizing PO strength. The tool consists of a series of indices following the cascade of activities, outputs, and outcomes/impacts shown in figure 6.1 that underlies the 'Simplified Fair Trade Theory of Change for Small Producer Organizations' (see Appendix E1) The indices reflect those outcomes and outputs that are related to aspects of producer organizations that are under the control of the local actors.

Figure 6.1 Cascade of change

Adapted from the "Fairtrade theory of change," December 2013.

Interpreting and understanding the indices

Each of the indices in the table expresses numerically how the PO ranked compared to other POs. The indicators selected were chosen to provide a sense of performance on dimensions a theory of change regarding POs that is consistent with those of the standards bodies (See the section on 'calculating indices at the end of the Methodology section for further detail.) The indices are listed under the Fairtrade outcomes or outputs from the *Fairtrade Theory of Change, Version 2.0, September 2015 Figure 8: Simplified Fairtrade Theory of Change for Small Producer Organizations.*[40]

For example, indices of performance to support development of "Strong and Inclusive POs" are: leadership, women's participation, membership volatility, PO services and support, and infrastructure. The indices table 6.1 shows that for "leadership," target PO A ranks poorly at 0.67 while target PO B at 0.86 ranks closer to the top two POs. Index scores thus reflect performance relative to the 'peer group.' Both the ranking values and the absolute data have value – the indices allow aggregation of several indicators to offer a digestible, intuitive picture of how a PO is performing in comparison to others, and how indices compare to each other; the absolute data allows shows that actual performance on an indicator could be quite low.

To understand the indicators that comprise the leadership index and actual level of performance by the POs, see Appendix E.2, which shows that the index is constructed from 2 indicators showing 'trust' leadership, the percentage of farmers who say the PO acts in farmers' best interests and the percentage that always or sometimes understands price calculations. The review of the underlying data shows beyond the ranking numbers which are all above 0.65 that farmers rated their POs very low on these trust leadership factors. Where understanding absolute values of indicators helped interpret finding, the actual performance those measures are discussed within the findings section.

A key observation from the indices is that while the target POs rank higher than any of the other POs on the "impact level farm indicator index," (top row of table 6.1), they rank among the lowest on "combined outcome and output index" which averages a PO's rankings on all the indicators that make up the indices. Because the POs in the sample were relatively similar, it is possible at this early stage that the expected positive effects of stronger management were not detected by the PO tool. At end line, we will see if there was change in the indicators correlated to a strong PO and if this was accompanied by change in farmer performance. We will also test some additional indicators to better understand PO performance. For more on the indices, see Appendix E1-E3.

[40] We used the Fairtrade theory of change graphic because it had the most detail on PO theory of change and appeared very consistent with UTZ published material on POs.

Table 6.1 Baseline outcome and output indices

	Target		CMS control		Non-CMS control	
	PO A	PO B	PO C	PO D	PO E	PO F
Impact level farmer indicator index	0.93	0.94	0.61	0.79	0.83	0.67
Resilient viable small producer businesses [41]						
Marketing relationships index	0.50	0.50	0.83	0.33	0.92	1.00
Profitability index	0.03	0.00	0.00	0.03	0.00	1.00
Strong and inclusive POs						
Leadership index	0.67	0.86	0.72	0.98	0.90	0.45
Women's participation index	0.85	0.71	0.57	0.96	1.00	0.69
Membership volatility index	0.00	0.20	0.00	0.70	0.93	1.00
PO service and support index	0.67	0.75	0.70	0.97	0.93	0.72
Infrastructure index	0.89	1.00	0.73	0.72	0.57	0.67
Fair price index	0.87	1.00	0.75	0.87	0.62	0.99
Increased investment in small producer organizations						
Investment and financing index	0.48	0.76	0.38	0.50	0.43	0.67
Management systems index	0.50	0.33	0.67	0.17	1.00	0.79
Democratic processes, transparency index	0.83	0.73	0.95	0.81	0.86	0.90
Combined output and outcome indicators index	0.57	0.62	0.57	0.64	0.745	0.81

[41] Taken from the resilient and reliable small producer businesses outcome, this outcome refers to small businesses, but not exclusively POs. We have applied these to the sample POs as they are highly appropriate for measuring the business outcomes of the POs, an important component of PO strength.

Role of the marketer as certification implementer

Having an entity that markets products and also implement certification offers the potential for some strong and useful synergies that can benefit farmers. In general it would appear to be a useful arrangement that has clear merit in regard to the market-oriented connectivity for farmers and sustainability practices. However, it may also introduce some potentially unavoidable conflicts of interest. CMS appears to bring an earnest conviction toward wanting to improve livelihoods for West Kenyan farmers. They have strong experience in coffee production and understand how the market values and pays for coffee. However, tying the certification to strictly business interests rather than development intentions can be problematic.

The tension that can exist has played itself out in this initiative as two different POs have voted to change marketing agents for reasons having nothing to do with certification, yet when the business relationship ends, so does the certification initiative. Also, the marketing agent has expressed that certification can improve prices sufficiently for farmers due to improved quality that they do not need to sell the coffee as certified to obtain a certification premium. However, without selling the coffee as certified, there is no Fairtrade premium that is used for development projects and one channel on the Fairtrade theory of change could be curtailed.

Access to fair prices

When interviewed, CMS marketing agents contend that benefits will accrue to POs, their members and CMS even if CMS is unable to find a buyer for Fairtrade certified coffee because according to CMS, many of the benefits from certification arise from higher quality and yields. While the opinion of CMS supports some aspects of the Fairtrade's theory of change, it also suggests that the expected output "enhanced access to fair trading conditions and fair prices" will likely not materialize. This, in turn, will likely limit realization of the outcome of "a growing proportion of trade is on Fairtrade terms". Other outcomes and impacts that depend on the fair pricing and the community-social fund could also be curtailed if a limited quantity of coffee is sold as certified. At end line, we will check for price premiums. If there were none and thus no community social fund, we will ascertain, if possible and likely through qualitative means, whether the lack of premium limited the Fairtrade impacts on farmers.

Conclusion

The approach to the study to understand the effects of dual Fairtrade/UTZ certification on smallholder coffee farmers - using a specific and accessible mixed methods approach – is expected to be effective in similar situations that ISEAL members often face: 1) farmers exposed to diverse interventions that can obscure the effects of certification; 2) where there is selection bias (introduced here by the implementing agent when selecting POs for certification); and 3) where sample sizes cannot be large and it is difficult to find similarly comparable organizations (as controls).The quantitative difference-in-differences (DID) approach provides rigorous estimation of indicator performance levels. The more qualitative contribution analysis helps to establish attribution and can provide some of the reasons for the results observed.

Also presented is an analysis of PO strengths and their relationship to farmer performance. To make the findings more accessible, we used indices that aggregate multiple related indicators from the six POs. The indices use a straightforward method of calculation that ISEAL and its members could also utilize to create their own customized summaries combining farmer and PO level data for a more detailed understanding. The report also provides such examples of the relative indices along with actual performance data to help better formulate a comprehensive depiction of the conditions of the POs and their farmers.

A snapshot at baseline reveals that sample farmers had generally small coffee plots but considerable experience in farming as well as nearly complete primary education. Yields ranged between 458-537 kg of green bean equivalent per hectare. Coffee net income ranged from USD 760-963 per hectare, though most planted far less in coffee. Total net income per household member ranged from USD 259 to 334, with coffee accounting for 20 to 25 percent of net income. According to the focus groups, even though the percentage of income from coffee is modest, farmers feel they have little choice but to grow coffee because of the role it plays in bringing a lump-sum of cash for school fees or food purchasing during the lean or ‘hunger months’.

Farmers face difficult conditions with a third of households experiencing some hunger during the year. Most homes used smoky cooking fuels and did not have ventilation, a good indicator of quality of life expressed as poor housing and health conditions. Farmer opinions on their quality of life seemed to reflect these difficult conditions with a minority of farmers saying that their quality of life was good or very good.

A further look at baseline findings shows that a high percentage of farmers used at least one practice to conserve soil and promote its ability to provide water to plants, but that rate quickly diminished when evaluating the percentage of farmers using at least two of the potential seven measures available. A majority of farmers said the community took fair or poor care of the environment.

The sample POs in this study were all established at least 25 years ago and have substantial memberships ranging from 1,000 to 2,600 – in part because organizations are a vital factor in the coffee industry. The indices showed that control POs (non-CMS) generally ranked higher on indicators of strength and inclusivity, enhanced benefits for small producers, and increased investment levels. This may reflect the targeting strategy of CMS. The target POs ranked higher on indicators measuring their farmers’ situations for topics such as hunger, access to drinking water, soil conservation practices, the perception of quality of life, and participation in community projects.

The study also revealed that target groups differed significantly from the control groups in several ways including yield and net income but the differences were not large in terms of absolute numbers. This does not present a problem for a valid impact assessment at end line because the DID approach selected does not depend on targets and control groups being at precisely the same point.

Although the approach to contribution analysis does not require qualitative investigation to occur at baseline, we patterned the contribution analysis after the DID design to investigate reasons for the quantitative results we see at *baseline.* This has provided information that will help to better understand and attribute impacts at *end line.* We have included the results since this understanding could also help the certification implementers to choose elements to emphasize during certification implementation. Elements to consider include working with the POs to figure out how best to give farmers incentives for quality, monitoring farmers' application of best practices, reducing uncertainty about whether benefits from practice adoption such as fertilizers and pruning will outweigh the investments, and understanding the incentives for farmers to undertake new investments or practices.

Finally, the qualitative investigation has alerted us to the situation that Producer Organization A is currently the only PO still part of the CMS certification project out of four that were at various times slated for certification. Even so, it is still not yet certified. In order to have the investment in this impact assessment pay off, care should be taken to ensure that this PO is certified before the end line measurement phase. It is also possible that PO B will ultimately pursue certification though this appears to be out of the question for the 2015-16 production year.

Finally, we will continue at end line to try to understand the effects of a marketing agent acting as project implementer, particularly where it is vital to have such an agent for marketing. Tying certification to a marketer can have considerable merit – if there are no other viable options, it can also present a risk. It can also present farmers with conflicting motivations for selecting a marketer. Illustrating the inherent tension in this arrangement, two POs have abandoned their certification quest (not because of any specific issues with certification) because they have chosen to leave the particular marketer and believe they have limited options to continue on toward certification. The policy context in Kenya may also soon play a role. According to CMS, local governments acting on provisions of the 2010 constitution are now taking an active role in coffee marketing and it is not clear what role, if any, they may want to play in farmer certification. The standards bodies will want to carefully monitor this situation.

We look forward to continued collaboration with ISEAL and 3ie in order to create the necessary tools to better understand the effects of certification for smallholder coffee farmers in Kenya and beyond.