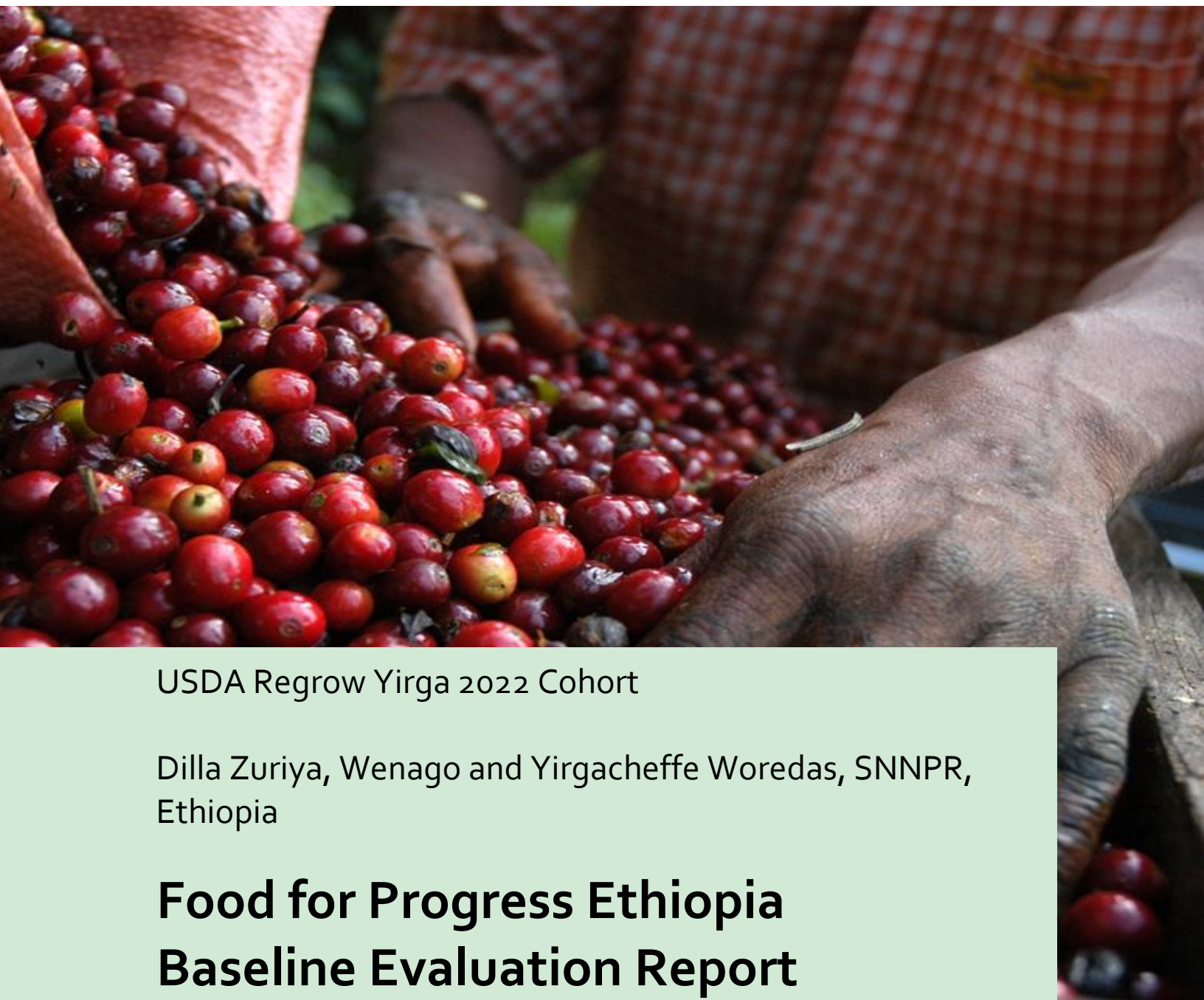




United States
Department of
Agriculture



USDA Regrow Yirga 2022 Cohort

Dilla Zuriya, Wenago and Yirgacheffe Woredas, SNNPR,
Ethiopia

Food for Progress Ethiopia Baseline Evaluation Report



USDA Regrow Yirga 2022 Cohort: Food for Progress Ethiopia Baseline Evaluation Report

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	8
AGRONOMY BEST PRACTICE ADOPTION SUMMARY	9
HOUSEHOLD CHARACTERISTICS SUMMARY	11
FINANCIAL PROFILE SUMMARY	12
INTRODUCTION	13
RESEARCH DESIGN	15
AGRONOMY BEST PRACTICES	18
RECORD KEEPING	20
REJUVENATION	20
IPDM	22
SOIL EROSION CONTROL	23
SHADE	24
COFFEE NUTRITION	24
WEEDING	26
OTHER AGRONOMY PRACTICES	28
INTERCROPPING	28
CLIMATE CHANGE	29
HOUSEHOLD CHARACTERISTICS	30
HOUSEHOLD COMPOSITION AND FARMER AGE	30
EDUCATION	32
COOPERATIVE MEMBERSHIP	32
LAND OWNERSHIP	33
FARM MANAGEMENT AND OWNERSHIP	34
COFFEE PRODUCTION AND SALES	35
COFFEE OPINION	37
ASSET OWNERSHIP	38
HOUSEHOLD LABOUR, PAID LABOR AND CHILD LABOR	41
ENVIRONMENTAL RESPONSIBILITY	42
FINANCIAL PROFILE	43
INCOME DISTRIBUTION	43
SAVINGS	44
VULNERABILITY PROFILE	46

FINANCIAL SHOCKS	46
FOOD SHORTAGES	46
HOUSEHOLD DIET	47
GENDER	49
HOUSEHOLD COMPOSITION	49
FINANCIAL DECISIONS.....	49
FOOD PURCHASING & PRODUCTION.....	52
GENDER EQUITY	52
POVERTY ANALYSIS	56
POVERTY PROBABILITY INDEX.....	56
MULTI-DIMENSIONAL POVERTY INDEX	57
WET MILL AUDITS	59
CONCLUSION & RECOMMENDATIONS	61
APPENDICES	64
BIBLIOGRAPHY	74

LIST OF FIGURES

Figure 1. Distribution of Agronomy Best Practices Adopted at Baseline	9
Figure 2. Distribution of Number of Best Practices Adopted at Baseline	10
Figure 3. Map of Surveyed Households, Colored by Woreda (Courtesy: QGIS)	13
Figure 4. Distribution of Agronomy Best Practices Adopted all Households.....	18
Figure 5. Distribution of Number of Best Practices Adopted	20
Figure 6. Farmer with a TechnoServe Record Card	20
Figure 7. Left: Old, Un-Stumped Trees. Middle: Stumped Coffee Trees. Right: Stumped Tree after Some Years.....	21
Figure 8. Main Pests Reported by Households at Baseline	22
Figure 9. Main Diseases Reported by Households at Baseline	22
Figure 10. Number of IPDM Methods Known to Households	23
Figure 11. Mulched Coffee Tree	23
Figure 12. Stumped Coffee Intercropped with Banana Trees	24
Figure 13. Shade Levels at Baseline	24
Figure 14. A Compost Heap	25
Figure 15. Types of Compost Observed on Farms	25
Figure 16. Fertilizers Used in the Past One Year – Self Reported & Observed (multiple select).....	26
Figure 17. Coffee Field Weeded by Digging	26
Figure 18. Common Weeding Methods under the Tree Canopy.....	27
Figure 19. Intercropping at Baseline, all farmers.....	28
Figure 20. Perception of Weather Patterns Affected by Climate Change at Baseline (multiple select)	29
Figure 21. Agronomy Practices Known to Reduce Impacts of Climate Change.....	29
Figure 22. Distribution of household size.	30
Figure 23. Distribution of number of children.	31
Figure 24. Distribution of ages by gender.....	31
Figure 25. Level of education by gender.....	32
Figure 26. Distribution of total farm size in hectares.	33
Figure 27. Distribution of coffee farm size in hectares.....	33
Figure 28. Pattern in ownership and management.	34
Figure 29. Coffee sold by type.	35
Figure 30. Opinion on children becoming coffee farmers.	37
Figure 31. Opinion on the future of coffee farming.	38
Figure 32. Ownership of Key Assets.....	40
Figure 33. Responsibility of farm activities in the household.....	41
Figure 34. Portion of Total Household Income from Coffee.....	43
Figure 35. Other Income Sources.....	44
Figure 36. Savings methods.	45
Figure 37. Common sources of financial shocks faced by households.	46
Figure 38. Main months of food shortage for households facing food shortages.	47
Figure 39. Main Types of Food Consumed.....	48
Figure 40. Household Composition.....	49
Figure 41. Who normally decides how to spend money from coffee sales?.....	50
Figure 42. Who normally decides how to spend other/non-coffee income?.....	50

Figure 43. Who normally decides how to spend household income on major expenses?	51
Figure 44. Who normally decides how to spend household income on minor expenses?	51
Figure 45. Who is mainly responsible for saving in the household?	51
Figure 46. Who makes food purchase decisions in the household?	52
Figure 47. Who participated in production of crops that are grown primarily for household consumption in the last 12 months?	52
Figure 48. Men and women should have equal opportunities in all spheres of life.	53
Figure 49. Women should have the same chance to earn income as men.	53
Figure 50. Men's and women's contribution to the farm should be equally valued.....	54
Figure 51. The husband should help with household chores.	54
Figure 52. Women should play an equal role as men in the financial management of the household.	55
Figure 53. Women should play an equal role as men in the financial management of the coffee farm. ..	55
Figure 54. Simple Poverty Scorecard based Poverty Rate	57
Figure 55. Multidimensional Poverty - Incidence and Intensity	58
Figure 56. Contribution of each Indicator to Overall Poverty	58

LIST OF TABLES

Table 1. Best Practice Adoption Rate at Baseline	10
Table 2. Best Practice Adoption Rate at Baseline	19
Table 3. Pest and Disease Management Methods Known to Farmers.....	22
Table 4. Wet Mill Cherry Purchase and Total Parchment in KG, 2021/2022 Season	59
Table 5: Baseline and target values for all program performance indicators with definitions	64
Table 6: Disaggregated baseline values for all program performance indicators	67
Table 7: Adoption Rules and Pass Rates	68
Table 8. Adoption Rates of Single and Couple Households	69
Table 9. Average Characteristics of Low and High Best Practice Adopting Households	70
Table 10 . PPI Scorecard.....	71
Table 11 . MPI Functional Form	73

List of Acronyms

<i>Acronym</i>	<i>Full Name</i>
<i>IPDM</i>	Integrated Pest And Disease Management
<i>MPI</i>	Multi-Dimensional Poverty Index
<i>PPP</i>	Public–Private Partnership
<i>SNNPR</i>	Southern Nations, Nationalities, And Peoples' Region
<i>FFG</i>	Focal Farmer Group
<i>ETB</i>	Ethiopian Birr Rates
<i>USD</i>	United States Dollar
<i>TLU</i>	Tropical Livestock Units
<i>IFPRI</i>	International Food Policy Research Institute
<i>FAO</i>	Food And Agriculture Organization
<i>HDDS</i>	Household Dietary Diversity Score
<i>UNDP</i>	United Nations Development Program
<i>USDA</i>	United States Department Of Agriculture
<i>QGIS</i>	Geographic Information System
<i>GPS</i>	Global Positioning System

EXECUTIVE SUMMARY

With the aim of increasing productivity in the Ethiopian coffee sector, TechnoServe began implementing the five-year Regrow Yirga project, funded by USDA's FFPr program, in October 2021 in the Dilla Zuriya, Wenago and Yirgacheffe woredas of Ethiopia. As part of this project, the 2022 cohort of the Regrow Yirga Coffee Farm College program began training in January 2022.

Activities were initially delayed by the government of Ethiopia, in the midst of the COVID crisis, denied TechnoServe permission to import the commodity and complete the monetization phase. Government engagement was further complicated by government officials not being in office during the start of the COVID-19 pandemic, internal changes within the ministry leadership following a new government, and the government's shift of attention to the ongoing civil war in the country. In early 2021, TechnoServe received approval from USDA to monetize in a third country which was completed in Kenya in mid-2021, during which recruitment of the project team was underway in parallel.

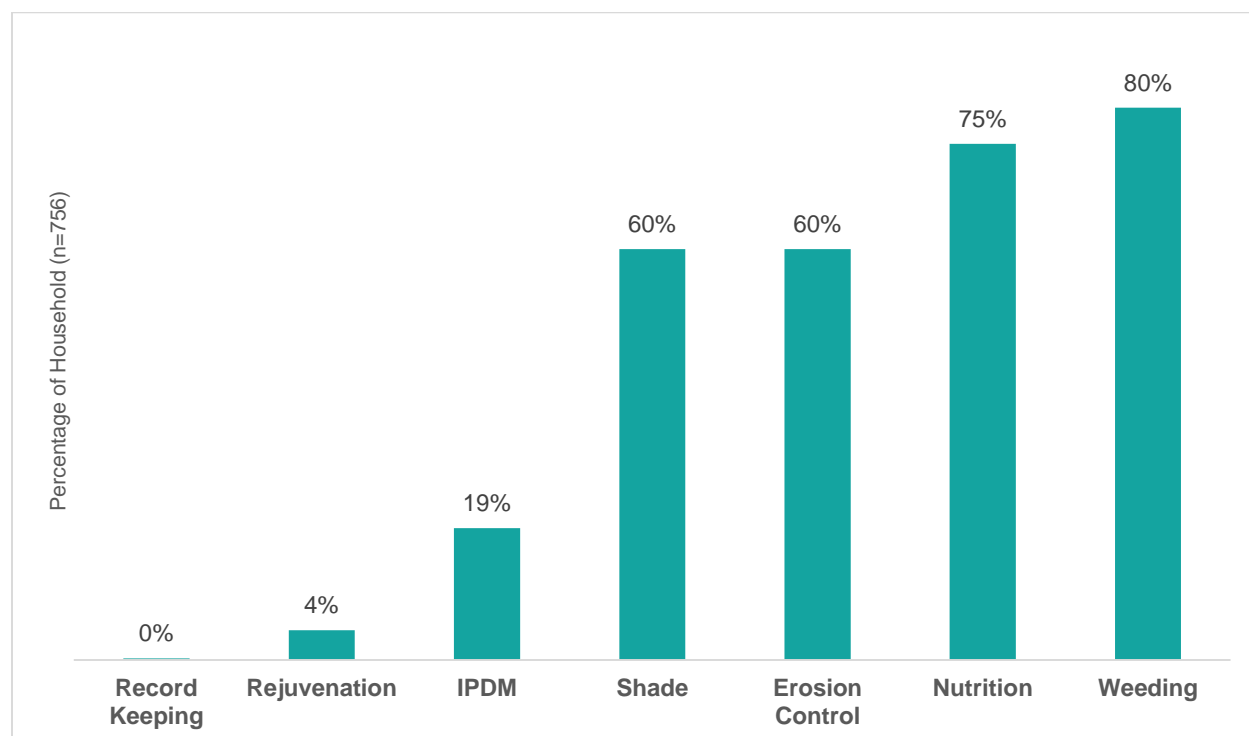
The objective of this report is to measure the adoption of best agronomic practices at baseline in order to assess the impact of the Coffee Farm College agronomy program after two-years. The report also provides a strong emphasis on the profiles of coffee farmers in the program target areas. These insights will help inform the training content and ongoing implementation of the Coffee Farm College.

The main hypothesis of this study is that high attendance farmers (i.e., those farmers that attend half or more of the training topics) will be more likely to experience an increase in the adoption of agronomy best practices by the end of the Coffee Farm College, due to increased exposure to ideas and being more likely to take risks after witnessing demonstration plot results. This link between training and adoption is expected to take place via the moderating variable of knowledge gain, as farmers will first acquire the knowledge of best practices before being able to adopt themselves. This expected knowledge gain (and subsequent adoption) is also influenced by moderating variables such as access to finance, inputs and labor, as well as motivation quality of training. Due to the observational nature of this study (adoption is assessed by enumerator observations on farms), these intermediate variables and links between training and adoption will not be fully explored in this evaluation. The change in best practice adoption, as well as any association between adoption and training attendance, will be observed in the endline report due to be completed in 2025. While best practice adoption is only an intermediate result of increased productivity, the hypothesis of training leading to increased productivity is not included in this particular report as we do not expect to see much impact on yield immediately after the two-year training program. Self-reported coffee production reported below will be compared from baseline to endline, although farmer-reported yield data is often unreliable. As part of the overall project evaluation, a yield survey will be conducted (without a baseline but using un-stumped trees in the same plot harvested under the same conditions as a counterfactual) measuring yield of stumped and un-stumped coffee on the same plot. In previous work together, Laterite and TechnoServe have conducted several annual demo plot yield surveys (with up to 5 years of data per survey) indicating that stumped coffee plots can produce two to three times as much coffee as plots that are not stumped.

AGRONOMY BEST PRACTICE ADOPTION SUMMARY

Farmers were assessed on seven agronomy best practices: record keeping, integrated pest and disease management, erosion control, rejuvenation, weeding, coffee nutrition, and shade management. Adoption of these best practices is based on rules developed by TechnoServe's experience and expertise in the coffee farming field (for detailed adoption rules, please refer to the appendix).

Figure 1. Distribution of Agronomy Best Practices Adopted at Baseline



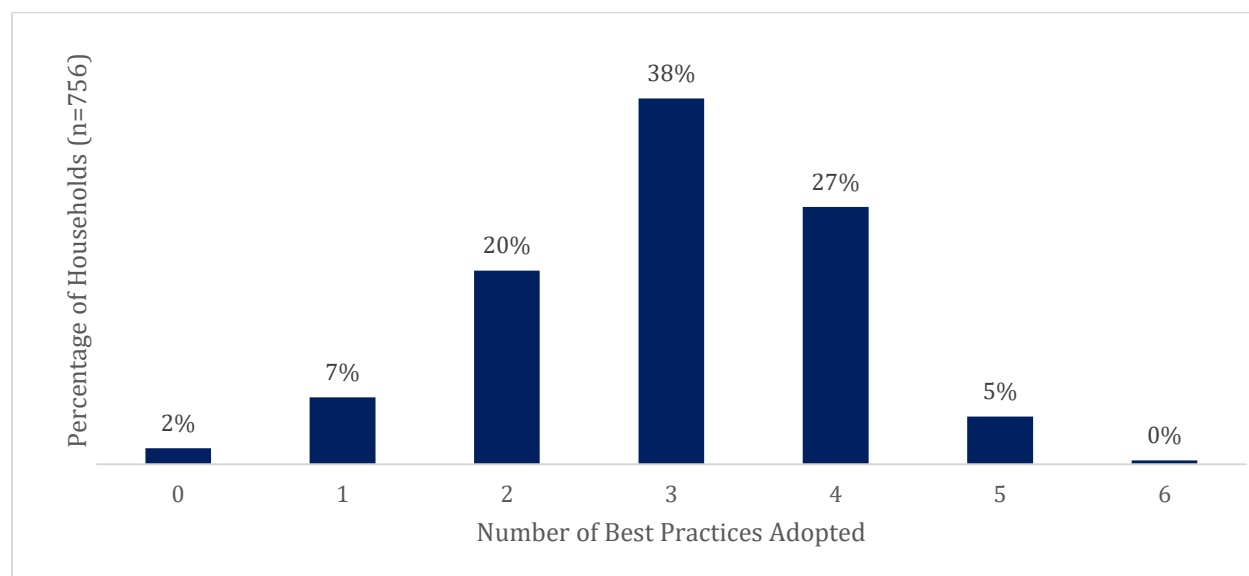
As shown in Figure 1, baseline adoption of agronomic best practices was mixed. The best practices adopted by three quarters or more of the population were coffee nutrition (75%) and weeding (80%). For the coffee nutrition best practice, farmers needed to (i) have trees leaves showing no signs of nutrient deficiency and (ii) use at least one nutritional product, which can include compost or manure; most farms in Ethiopia are organic. For weeding, the farm needs to weed at least twice per year, have no or only few weeds under the tree canopy, and any existing weeds need to be less than 30cm tall or wide. Farmers fail to adopt weeding if they dig under the tree canopy, as this might damage sensitive coffee roots. It must be noted that data collection took place during a dry period, when weed pressure is low so there not a good indication of actual adoption of the practice as during this time of the year weed adoption is not well observable.

Based on the expertise and experience of TechnoServe, rejuvenation is the most critical best practice in Ethiopia. Adoption of this best practice was low at 4% for baseline. In Ethiopia, trees are typically old and have never been rejuvenated, resulting in low production. Data collection took place after the implementation of rejuvenation training, and farmers who rejuvenated in 2022 were asked whether they stumped trees before or after the training. Based on this self-reported data on the time of

adoption, an increase in rejuvenation is visible for the period after the training (for details, please refer to the section on rejuvenation below).

Figure 2 shows that 32% of the households were adopting more than half (four) of the seven best practices. Only 8% of households adopted one or no best practice at all. Overall, the results indicate that there is a high potential to improve coffee management practices and increase coffee yields in the program region.

Figure 2. Distribution of Number of Best Practices Adopted at Baseline



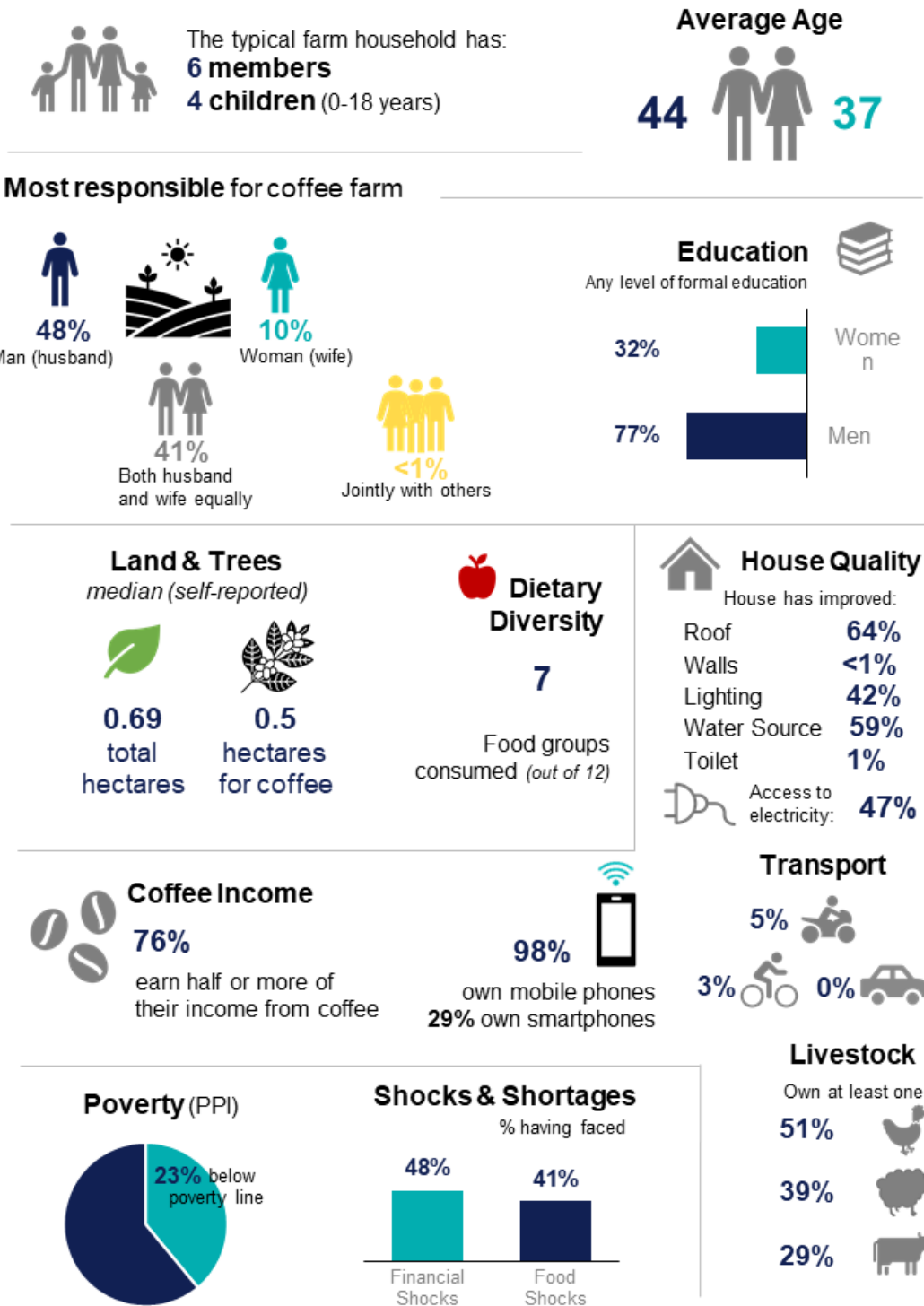
The table below gives detailed adoption rates of each of the seven Best Practices at baseline for the surveyed households.

Table 1. Best Practice Adoption Rate at Baseline

Best Practices	% Adoption Rate
Record Keeping	0%
Rejuvenation	4%
IPDM	19%
Erosion Control	60%
Shade	60%
Nutrition	75%
Weeding	80%
Farmers adopting 3 or more of the best practices	71%
Farmers adopting 4 or more of the best practices	32%
Average # of best practices adopted (of 7)	3
No. of Households	756

HOUSEHOLD CHARACTERISTICS SUMMARY

The graph below shows an overview of a typical household in the program area. On average, households have 6 adult members and 4 children, eat a moderately diverse diet, and own a mobile phone.



FINANCIAL PROFILE SUMMARY

Coffee Income. At baseline, coffee households were highly dependent on coffee, with 76% of the households reporting that at least half of their total household income comes from coffee.

Financial Savings. Around 80% of households were using a savings method, largely relying on savings from bank accounts and cash kept in the house.

Shocks & Shortages. At baseline, almost half of the households (48%) reported that they have been affected by at least one serious financial shock in the past year. At the same time, 41% reported having suffered from food shortages for around three months in the past year.

Poverty. Using the Poverty Probability Index (PPI) and Multi-Dimensional Poverty Index (MPI) scorecards, households were assessed on their poverty profiles at baseline. Around 23% of the households were likely to fall below the international \$1.90/day 2011 PPP poverty line using the PPI, a lower proportion compared to rural households in SNNPR (28%). Using the MPI, 74% of the households are considered multi-dimensionally poor, compared to 87% of the households nationwide in 2011.

INTRODUCTION

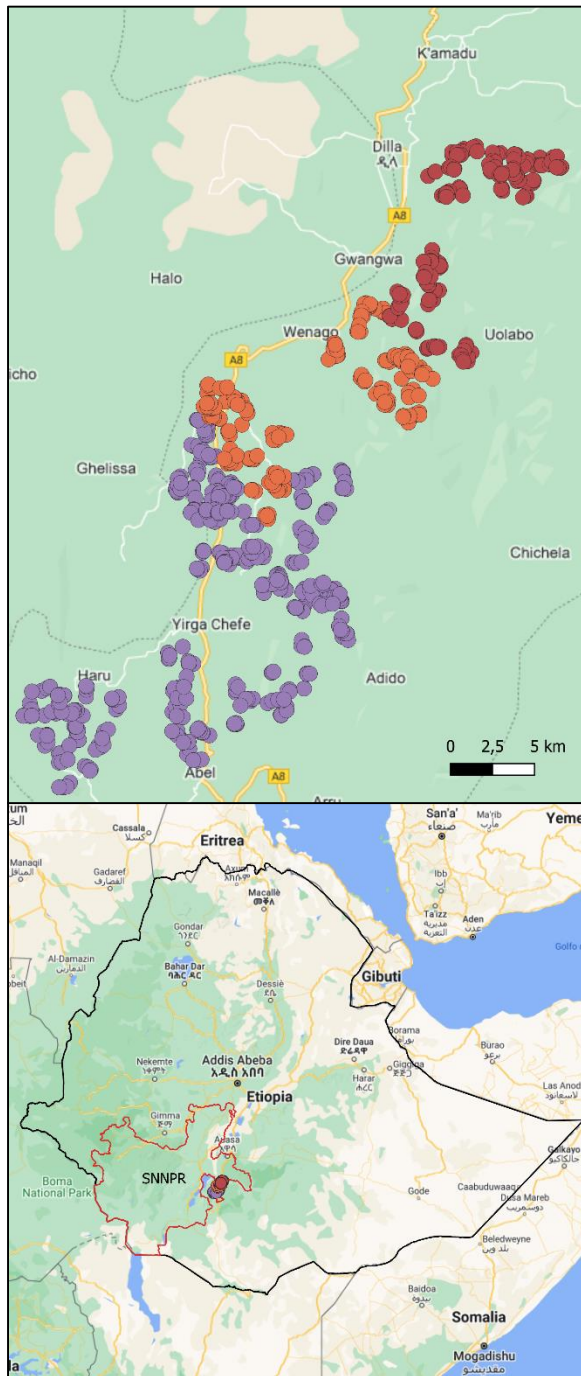


Figure 3. Map of Surveyed Households, Colored by Woreda (Courtesy: QGIS)

With the aim of increasing productivity in the Ethiopian coffee sector, TechnoServe began implementing the five-year Regrow Yirga project, funded by USDA's FFPr program in January 2022 in the Dilla Zuria, Wenago and Yirgacheffe woredas of Ethiopia. The program was funded in 2019 with a total budget of \$12,324,249.75, although implementation only began in 2022 due to previously mentioned delays.

As part of this project, the 2022 cohort of the Regrow Yirga Coffee Farm College program began training in January 2022. The program consists of 16¹ topics where farmers will be trained in various best agronomic practices designed to sustainably improve the quantity and quality of their coffee production, thereby increasing their income and improving the socio-economic conditions of their families.

The Coffee Farm College is built on a participatory and intensive activity-based training approach and aims at improving the adoption of best agronomic practices that can enhance productivity in a sustainable manner. The Coffee Farm College comprises five interlinked components: curriculum and content development, localized training through Focal Farmer Group (FFG) sessions, provision of all the necessary training tools and equipment, follow-up support, and monitoring of adoption.

This report presents the results from a baseline survey of 756 households conducted by Laterite in March of 2022, which collected detailed information on household and farm characteristics, as well as

¹ Exact number of topics will depend on farmer need and interest and field team feedback.

the adoption of various coffee agronomy best practices.²

The objective of this report is to measure the adoption of best agronomic practices at baseline to set the stage for assessing the impact of the Coffee Farm College agronomy program after two-years. The report also provides a strong emphasis on the profiles of coffee farmers in the program woredas. These insights will help inform the training content and ongoing implementation of the Coffee Farm College.

² The survey has been conducted at the household level by a team of enumerators visiting the farms of each surveyed household, using tablets to collect information from question responses as well making observations and collecting photographic evidence.

RESEARCH DESIGN

Laterite Ltd., a data, research, an advisory firm, developed the research design for this baseline study; supported survey development, implementation, and survey monitoring; and finally conducted the analysis. A team of 16 enumerators and four field coordinators were managed by Laterite.

Overall Evaluation Design. This is a non-experimental, two-stage evaluation design (baseline and endline), tracking farmers before and after the Coffee Farm College trainings delivered by TechnoServe in four woredas in the Gedeo zone of Ethiopia. The estimated impact of the Coffee Farm College program will be based on exploring the association between the attendance of agronomy training sessions and the intermediate project outcome of best practice adoption, by studying how variation in attendance rates links to this outcome. While associations between changes in coffee yield and attendance will be explored at endline, self-reported yield data is unreliable and yields are generally not expected to increase much after only two years. Due to time constraints, a simplified inference strategy was implemented for cohort 1. More innovative inference strategies for cohort 2 will be discussed by Laterite and TechnoServe, this may include using matching methods to compare cohort 1 and cohort 2 outcomes, as well as randomizing stumping incentives to generate insights on which incentives lead to a greater adoption of recommended farming practices. The endline of cohort 1 (2022C) will serve as a project midline, while the endline of the second cohort (2023C), will serve as the project endline.

Limitations. The key limitation of this study is the lack of experimental design, meaning that no causal inference can be made when assessing the effect of the Coffee Farm College program on best practice adoption. Despite being non-experimental, this methodology should allow us to gain insights about the association between the attendance of agronomy training sessions and project outcomes, by studying how variation in attendance rates links to outcomes. More innovative inference strategies for the 2023 cohort will be discussed by Laterite and TechnoServe, this may include using matching methods to compare outcomes between cohorts, as well as possibly randomizing stumping incentives to generate insights on which incentives lead to a greater adoption of recommended farming practices.

A further limitation of the study is that the sampling strategy does not allow for comparison between attendees and non-attendees of the Coffee Farm College program, since all households in the sampling frame attended at least the first training session. Assuming sufficient variation in attendance levels among the sample, insights will be gained on how this variation in attendance links to program outcomes, specifically best practice adoption.

Sampling Strategy. The sampling frame for this study consisted of an estimated 22,622 coffee farming households across 32 kebeles in the Dilla Zuriya, Wenago and Yirgacheffe woredas. The sampling frame is organized by focal farmer group and comprises households that attended the first session of the Coffee Farm College in January 2022.

A two-stage clustered random sampling method was used to select households, stratified at the kebele level. The sample was stratified across the 32 program kebeles, assumed to be independent local administrative units, ensuring the geographic efficiency of the sample.

- 1st stage clustering: Within each kebele, one quarter of focal farmer groups were randomly selected.
- 2nd stage clustering: Four households were randomly selected within each focal farmer group. A secondary sample of an additional four households was also randomly sampled for each FFG, to be used in the event that one or more households from the primary sample could not be located or refused to be interviewed.

A total of 756 coffee-farming households across 32 kebeles were surveyed. A two-stage sampling strategy was chosen to optimize the number of clusters within a kebele and the number of households within a cluster, in order to gain the most statistical power.

Sample Size Determination. Given time constraints in the design phase of the evaluation process, no extensive power calculations were performed when determining sample size for this study. Sample size was instead determined by using prior experience in comparable contexts (Coffee Farm College cohorts in Ethiopia) where power calculations were performed to determine an acceptable sample and cluster size that would deliver reasonable effective sample sizes and error margins for each best practice examined in the study. This was further confirmed by the results in Table 2, where relatively low error margins are seen for each best practice. A slightly smaller sample size for cohort 1 was also decided upon in order to allow for a larger sample in cohort 2, where options for a more innovative research design will be explored.

Inference. In order to make generalizations about the larger population (the 22,622 households that attended the first training session), one can estimate design effects (the statistical power lost from the clustered approach described above), the effective sample sizes (the sample size required to achieve the same level of precision, if that sample were to be a simple random sample) and error margins (how much we can expect our results to reflect the overall population). These statistics will be calculated for each intermediate outcome of interest (adoption of best practices) in the study. While inference for yield is not the focus of this baseline survey, a yield survey conducted later in the project will evaluate changes in yield for a smaller sample of farmers.

Variables of interest. This study focuses on three sets of variables: (i) farmer and household characteristics, including data on demographics, diet, assets, labor status and gender dynamics; (ii) coffee-related characteristics, including farm-based observations of agronomy best practices; and (iii) participation levels in the program, which will be measured at endline.

Hypotheses. The main hypothesis underlying the research design is that high attendance farmers (i.e. the farmers that attend half or more of the training topic sessions) will be more likely to experience an increase in the adoption of agronomy best practices by the end of the Coffee Farm College. In addition, it is expected that households with better socio-economic indicators (e.g. education and land size) at baseline will be more likely to attend the training sessions and thus more likely to adopt agronomy practices. Consequently, we will seek to measure the relative best practice adoption amongst the different attendance groups and also examine socio-economic characteristics of these farmers to understand some of the determinants of adoption. It is important to reiterate that

associations between attendance and adoption of agronomy best practices will not constitute causal evidence of impact as there is no observed counterfactual.

Data Quality

To ensure reliable and high-quality data, numerous quality checks are conducted throughout baseline data collection. These include back-check surveys, periodic picture checks, data collector and duration audits (including GPS checks), designed to monitor the activity of data collectors and the quality of the surveys they submit. Survey submissions are also monitored on a daily basis, with constant feedback being shared with the Laterite data team in the field.

Best Practice Baseline Survey

Households were visited in March 2022 to collect data on demographics, diet, assets, and labor status and to observe adoption of farm-based agronomy best practices. The overall rate of completion for the survey was 100% with 756 households interviewed. 94% of surveyed households came from the primary sample. The data was weighted using inverse probability weights. These were calculated by taking the inverse of the probability of sampling each focal farmer group within a kebele and surveying each household within an FFG. Both husband and wife were surveyed together in 57% of the surveys, while the wife alone was surveyed in 11% of the visits and the husband alone in 32%.

The survey included two main sections. The first section covered the demographic and socio-economic characteristics of each household. Under demographics, farmers were asked about their marital status, age, education, employment status, and household composition (i.e., how many adults and children were living in the household). The respondents were also asked to provide the age, and education status of each household member. Farmers were also asked about land and asset ownership (such as livestock, and various household items), income sources, nutritional diet, and financial shocks. Male and female farmers were also separately asked a set of questions on gender roles within the household (with their spouse being asked to leave the room during this time).

The second section focused on measuring the adoption of best agronomic practices, which will be the focus of the Coffee Farm College. First, farmers were asked a series of questions to test their knowledge on the various best agronomic practices. Second, they were asked about any records they could produce on coffee sold and costs incurred in the production of coffee. Finally, enumerators requested whether they could visit farmers' main coffee field to observe and determine the adoption of the best agronomic practices at the start of the Coffee Farm College. This field assessment was based on both questions asked to the farmers and direct observation of the coffee field by the data collectors.

Farmers were assessed on the following agronomic best practices: record keeping, integrated pest and disease management, erosion control, rejuvenation, weeding, coffee nutrition, and shade management. Coffee farmers were also assessed on their intercropping practices, where applicable (which does not count as one of the main best practices).

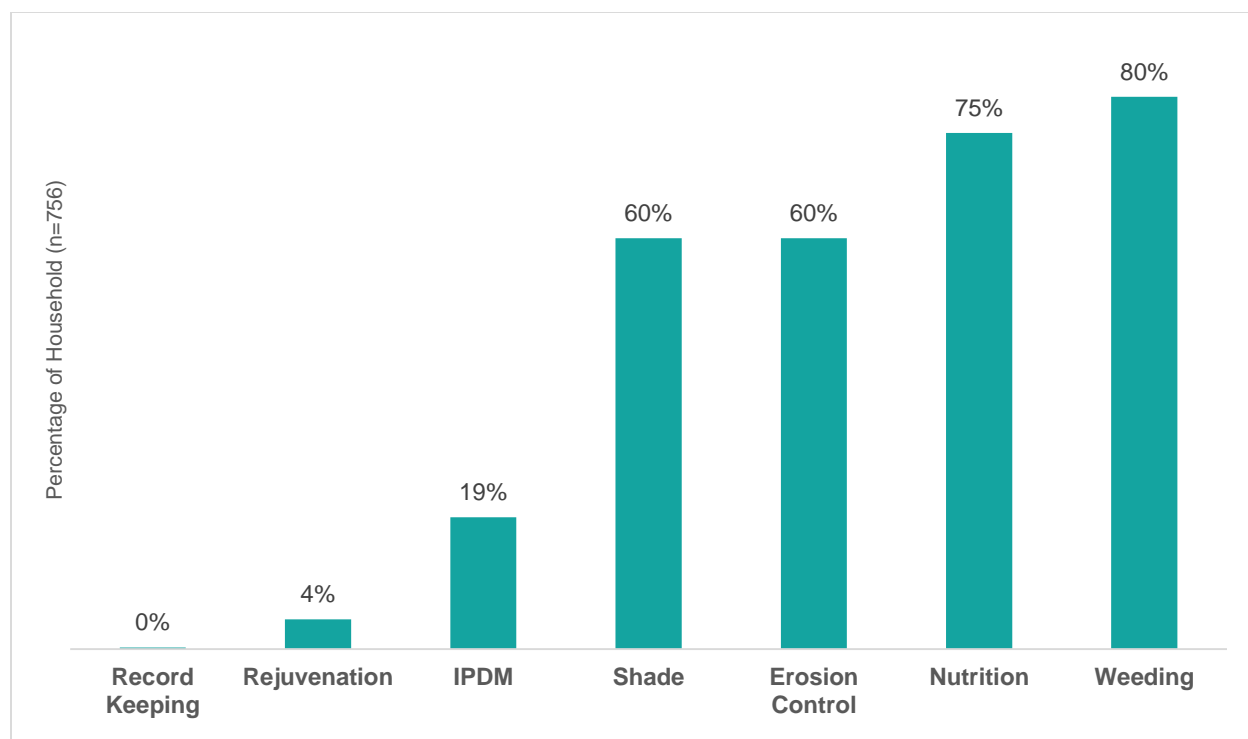
The analysis of **best practices** and **household characteristics** has been structured around the entire baseline sample of 756 coffee-farming households.

The remainder of this report is structured into several sections. The next section presents a detailed description of the adoption of each agronomy best practice by coffee farmers at baseline. The last

section describes the characteristics of farm households in greater depth (i.e. household composition, land and assets, coffee production, gender dynamics, nutrition and dietary diversity, income and poverty analysis, and shocks).

Farmers were assessed on seven agronomy best practices: rejuvenation, integrated pest and disease management, weeding, coffee nutrition, erosion control, shade management, and record keeping. Figure 4 shows best practice adoption rates at baseline.

Figure 4. Distribution of Agronomy Best Practices Adopted all Households



Weeding was the most frequently adopted practice (80%) Almost all visited farms (93%) have no or few weeds on their farm, and unlike other regions in Ethiopia, digging does not seem be a traditional practice in the program area; only 17% of farmers have dug under the tree canopy. Data collection did however take place during a dry period where weed pressure is low, and observations are dependent on season.

Nutrition was the second most frequently adopted practice (75% of households) at baseline. For this practice, farmers needed to (i) have trees with leaves showing no signs of nutrient deficiency and (ii) use recommended organic fertilizer, including compost or manure. The high rate of adoption at baseline is driven by the large proportion of farmers who use compost or manure on their farm (87% use at least one of the two).

Erosion Control adoption was also high at baseline (60%). To be considered adopters, farmers need to implement at least one of the recommended erosion control methods. This high adoption rate appears to be driven by the number of farmers who practice mulching (mostly leaf litter) on their coffee plots (54%).

Rejuvenation is the most important best practice in Ethiopia, as most coffee trees are rather old; the mean age for coffee trees on farms of this cohort is 24. Rejuvenating trees could increase coffee production by up to 200%³. However, stumping is only adopted by 4% of farmers at baseline, i.e., in 2020, 2021, and 2022 before the training on rejuvenation took place.

Table 2. Best Practice Adoption Rate at Baseline

Best Practices	% Adoption Rate	Design Effects	Effective Sample Size	Error margin
Record Keeping	0%	1	755	0%
Rejuvenation	4%	1,06	712	1,5%
IPDM	19%	3,05	248	3%
Erosion Control	60%	1,86	406	4%
Shade	60%	1,88	403	4%
Nutrition	75%	1,87	404	4%
Weeding	80%	1,24	607	3%
Farmers adopting 3 or more of the best practices	71%	1,5	514	3%
Farmers adopting 4 or more of the best practices	32%	1,4	547	4%
Average # of best practices adopted (of 7)	3	1,5	490	0.07
No. of Households	756	-	-	-

As can be seen from Table 2, design effects are relatively low for the best practice outcomes measured during the baseline. This implies that not much statistical power is lost from using a clustered sampling design, particularly for record keeping, rejuvenation, and shade. This is driven by the low level of inter-cluster correlation (the similarity of outcomes of households within the same focal farmer group) for these best practices. For rejuvenation, a design effect of 1.06 implies that a completely randomly drawn sample (non-clustered) would have the same statistical power with sample size of 712 households (only slightly lower than our current sample of 756). Effects are larger for IPDM, implying that IPDM knowledge is heavily correlated within focal farmer groups.

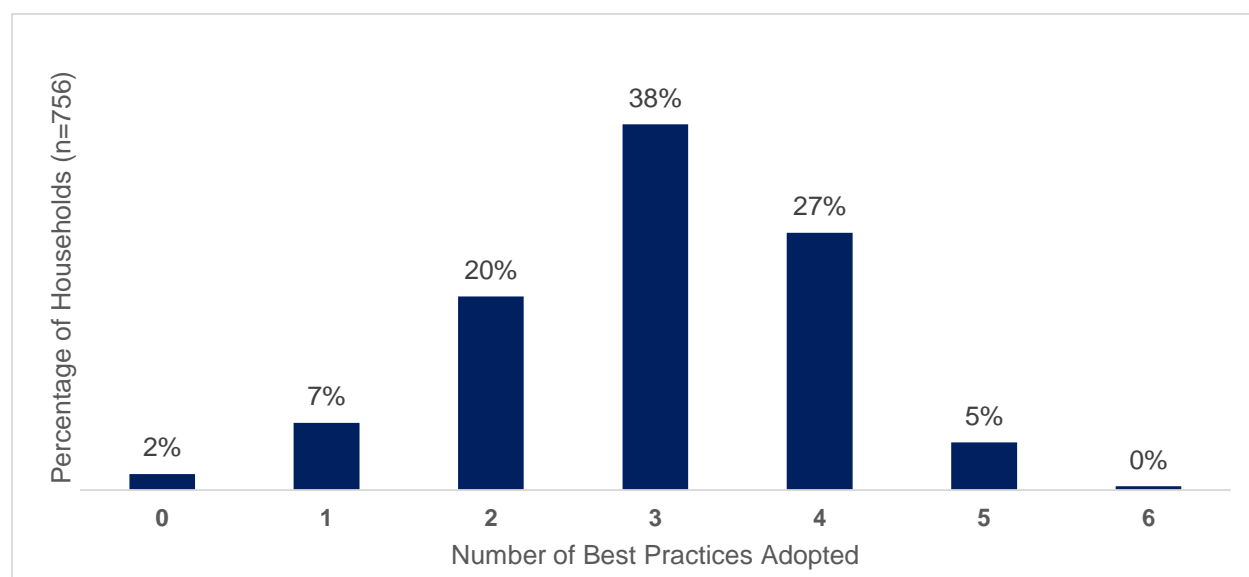
The error margins displayed in Table 2 allow us to understand how we can generalize these results to the larger Coffee Farm College attending population. Taking weeding as an example, an error margin of 3% means that we can expect the weeding adoption of the overall population to lie between 77% and 83% (using a 95% confidence level). Error margin should be taken in the context of the adoption rate being observed. For an adoption rate of 19%, IPDM has a relatively high error margin of 3%, implying adoption among the overall population may be between 16% and 23%, while for the practices of weeding and nutrition, 3% and 4% respectively is relatively low.

Figure 5 shows the total number of best practices adopted at baseline. At baseline, 32% of households adopted four or more of the best practices. 71% of households were adopting at least three best practices. These high adoption rates at baseline are mostly explained by high adoption rates of

³ An annual demo plot yield survey has shown that stumped coffee plots can produce two to three times as much coffee as plots that are not stumped.

weeding, nutrition, erosion control, and shade. Few households (2%) did not adopt any best practices.

Figure 5. Distribution of Number of Best Practices Adopted



RECORD KEEPING

It is very rare to find Ethiopian coffee farmers keeping any financial records. At baseline, only two households could show any income or expense records for their coffee farm. Literacy rates may be a barrier to adoption for many households as 72% of male farmers and only 26% of female farmers self-reported to be able to read and write in at least one language.

Farmers will be trained on record keeping as part of the Coffee Farm College program. The record keeping training will cover topics like financial planning, savings, profit calculation, and decision making. As part of these lessons, a simple pictorial record card will also be provided to all households. Low education and literacy levels make any record keeping challenging for farmers, so farmer trainers will support farmer comprehension along with lead farmers in each Focal Farmer Group.



Figure 6. Farmer with a TechnoServe Record Card

REJUVENATION

Stumping or rejuvenation is the most important best practice in Ethiopia and the most difficult for farmers to adopt as the coffee trees are taken out of production for two years. Adoption requires some coffee to have been rejuvenated (stumped) in the last couple of years, with the aim to rejuvenate each tree every seven to eight years. Most coffee trees in Ethiopia have never been

stumped, and as such are producing coffee on unproductive main stems that may be over 30 years old. An average yield on these old trees is 1.0 kg cherry per tree compared to yields of up to 3.0 kg cherry per tree on stumped trees, within two to three years after stumping⁴.

The Coffee Farm College teaches the benefits of stumping and limiting the number of main stems to three or four, via sucker selection. Farmers will also learn that after stumping, an intercrop such as beans or chilies can be planted to provide food or income while the coffee re-grows. 97% of farmers report to have attended the training in early 2022.

In the survey, farmers were asked whether they had stumped trees in 2020, 2021, or 2022. For each year of self-reported rejuvenation, photos were taken of corresponding trees to confirm. As a result, stumping rates below rely on observational, visually confirmed data. In order to generate a sample for the baseline survey (from the first attendance database), baseline data collection took place after the first training session on pruning and rejuvenation. Farmers who reported stumping for 2022 were therefore asked whether they rejuvenated their trees before or after attending the training. Visual confirmation was unfortunately not possible given that trees would look fairly similar, whether stumped in the few weeks before or after the training. While this does present a potential data quality concern as farmers self-report whether they stumped before or after training, over 91% of these households reported that they only stumped after participating in the training. In subsequent figures, we consider baseline adoption to be any stumping that occurred **before** training began.

At baseline in early 2022, only 4% of all farmers adopted the stumping best practice. 11% of farmers reported to have stumped in 2020, 1% in 2021, and 3% in 2022.

In 2020, 2021, and 2022 the mean share of trees stumped is much lower than the advised 20% per year. Of those farmers who stumped trees in 2020 and 2021, the mean **self-reported** number of trees stumped as a share of total trees on the farm is 4% and 3% respectively, while the mean share of trees stumped in 2022 was 3%.⁵ The mean total number of trees stumped for farms who stumped in the respective years is 135 in 2020, 50 in 2021, and 94 in 2022.

Figure 7. Left: Old, Un-Stumped Trees. Middle: Stumped Coffee Trees. Right: Stumped Tree after Some Years



⁴ An annual demo plot yield survey has shown that stumped coffee plots can produce two to three times as much coffee as plots that are not stumped.

⁵ Due to unreliability in self-reporting, the survey did not inquire about farms' total tree count. The values here are derived from an estimated tree density of 2,000 trees per hectare; i.e. multiplying the self-reported area of the farm planted with coffee by 2,000. The number of trees stumped in 2022 is then divided by the estimated total number of trees on the farm.

IPDM

The survey asks farmers about their main coffee disease and pest problems. Most households (78%) report not having any problem with pests (see Figure 8 below). Diseases are more common; 57% of households report having dealt mainly with Coffee Berry Disease (CBD) (see Figure 9 below).

Figure 8. Main Pests Reported by Households at Baseline

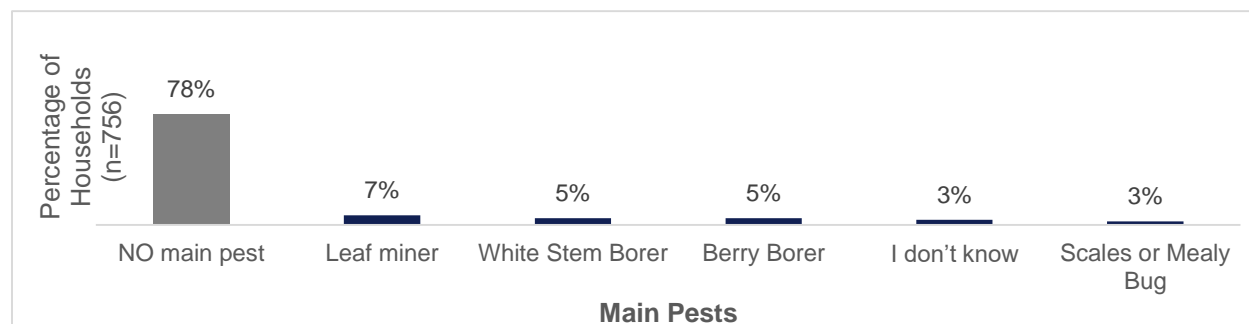
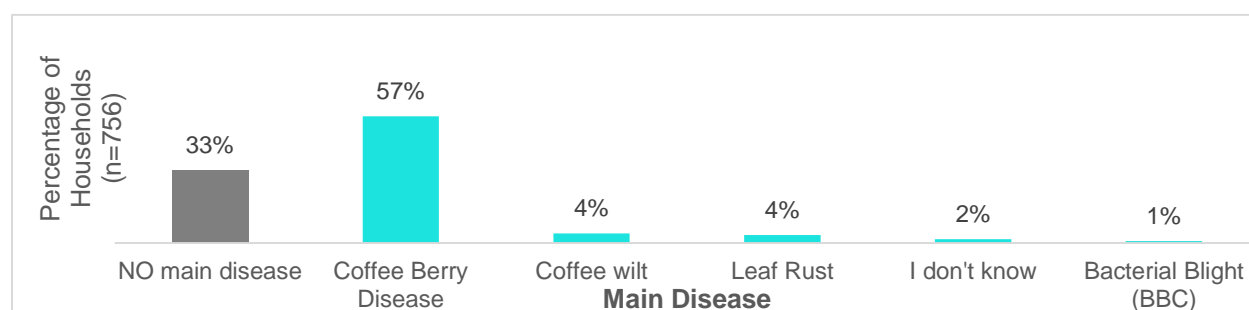


Figure 9. Main Diseases Reported by Households at Baseline



Coffee Farm College will teach farmers how to reduce the incidence of diseases and pests using integrated methods such as crop hygiene and good canopy management. It is important for farmers to know how to use a combination of pest and disease management methods, such as crop hygiene, to reduce the incidence of pests and diseases on their farms. Because integrated pest and disease management (IPDM) cannot be easily observed, the survey asks farmers which methods they know to control common pests and diseases.

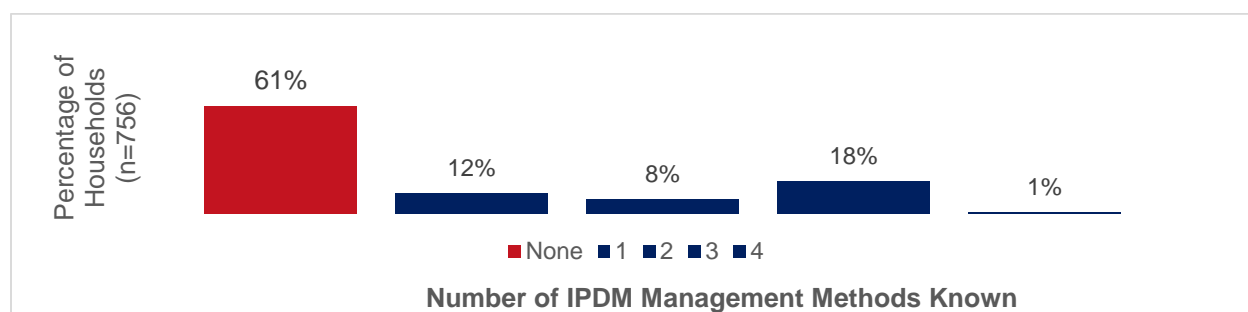
Table 3. Pest and Disease Management Methods Known to Farmers

Pest and Disease Management Methods	% of HH
Farmer does not use any methods	61%
Uproot badly damaged trees and replant	27%
Prune or keep the canopy open	10%
Plant cholera resistant varieties	8%
Use compost or good nutrition or keep the tree healthy	8%
Use good agricultural practices to reduce stress and keep trees healthy	7%
Smooth the lower section of the bark	7%
Rejuvenate (or stump) regularly to keep young main stems	7%

Harvest ripe cherries regularly	5%
Stump to reduce the egg laying sites	5%
Kill white stem borer by pushing a wire into the hole made by the borer	1%
Strip all berries at the end of harvest or collect fallen berries	1%
Encourage natural predators and parasites	0%
Use berry borer traps	0%

61% of farmers did not know any pest and disease management methods at all, while 27% were able to name uprooting damaged trees. Other methods are much less known, with between 1% and 10% of farmers being able to name them. On average, farmers are able to name one pest and disease management method. As shown in Figure 10 below, only 19% of farmers knew three or more methods and are considered to have adopted IPDM as a best practice at baseline.

Figure 10. Number of IPDM Methods Known to Households



SOIL EROSION CONTROL



Figure 11. Mulched Coffee Tree

Soil erosion results in the loss of top-soil, which leaves roots exposed and results in a loss of soil fertility, ultimately impacting yields. At baseline, 60% of households were adopting erosion control by using at least one method. This high adoption rate seems to be driven largely by mulching (54%) as well as terraces (3%) and cover crops (4%). The high mulching rate is in turn driven mostly by large amounts of leaf litter seen on adopting farms. 6% of the pictures taken by enumerators of mulch applied to the farm also show that mulch is applied next to stumped trees. If farmers who mulched around stumped trees were classified as failing the best practice (as it is possible that this mulching occurred after training), the adoption rate for erosion control would be 55%. Given that these pictures are limited in scope and only show a small portion of the farm, this figure has limited reliability.

Coffee farms in the area tend to be on medium (45%) or steep (31%) slopes, which makes erosion control critical for farmers.

Coffee Farm College will teach farmers the importance of erosion control in soil management, even on those fields without slopes, where wind erosion can take place. Farmers will learn various

techniques to reduce soil erosion, including how to plant stabilizing grasses, apply mulch, and prepare water traps on steep slopes. Households are encouraged to use at least one of the soil erosion control practices and ideally a combination. A water trap for example should have the upward slope planted with stabilizing grasses.

SHADE

Shade is important for Arabica coffee, which evolved in the dense forests of Western Ethiopia. Ideally, shade levels should be between 20-40%. Coffee trees will be subjected to high temperatures and high levels of moisture loss from both the leaves and the soil if shade levels are below 20%. Conversely, very high levels of shade (i.e. more than 40% shade levels) can result in reduced yields.

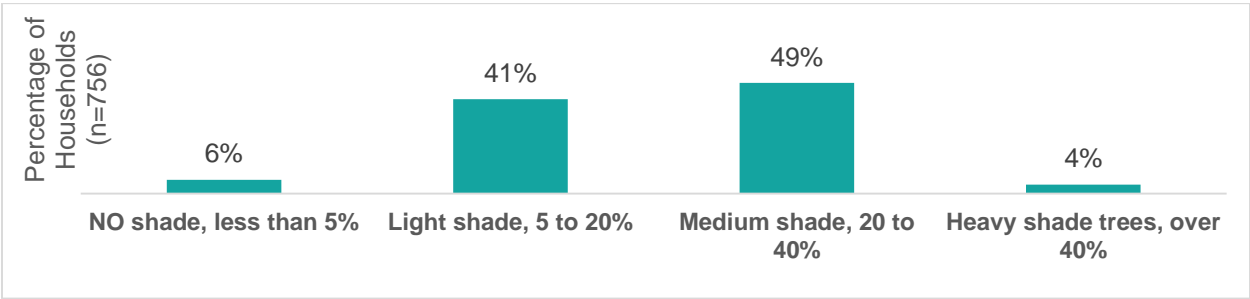


Adoption of shade requires shade at 20% or more, or less than 20% shade but new shade trees have been planted in the last two years.

At baseline, shade levels were relatively high, with 60% of the households passing the shade best practice, with 53% of farms showing medium to heavy levels, and 14% of the households having planted new shade trees in the past two years (some farmers had good shade levels as well as new shade trees).

Figure 12. Stumped Coffee Intercropped with Banana Trees

Figure 13. Shade Levels at Baseline



COFFEE NUTRITION

Ethiopia's soils are some of the best coffee soils in East Africa. The soil pH is close to neutral in most areas, so soil correction measures such as lime are often not required.

Chemical fertilizer use is limited in Ethiopia, allowing most farmers to grow coffee organically; and as a result, many coffee cooperatives are organic certified. As such, the key soil input is compost or composted manure, which adds organic matter and nutrients to the soil and improves water retention. Compost can be either home-made, including manure or composted pulp from the wet mills, which is often returned to the farmers.

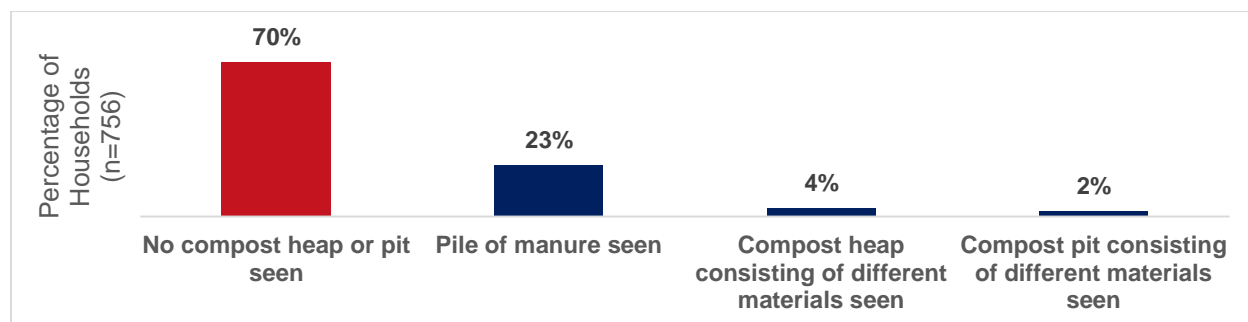
The nutritional status of the farm is assessed by observation of nutrient deficiency symptoms on the leaves (less than 5% of leaves) and the use of at least one organic nutritional product, such as compost or manure.



Figure 14. A Compost Heap

The use of compost or manure is self-reported since compost production is seasonal. However, enumerators do look for a compost heap, pit (the latter is not recommended by TechnoServe, as they are harder to turn), or pile of manure as evidence that composting is taking place on the farm (see Figure 15 below).

Figure 15. Types of Compost Observed on Farms



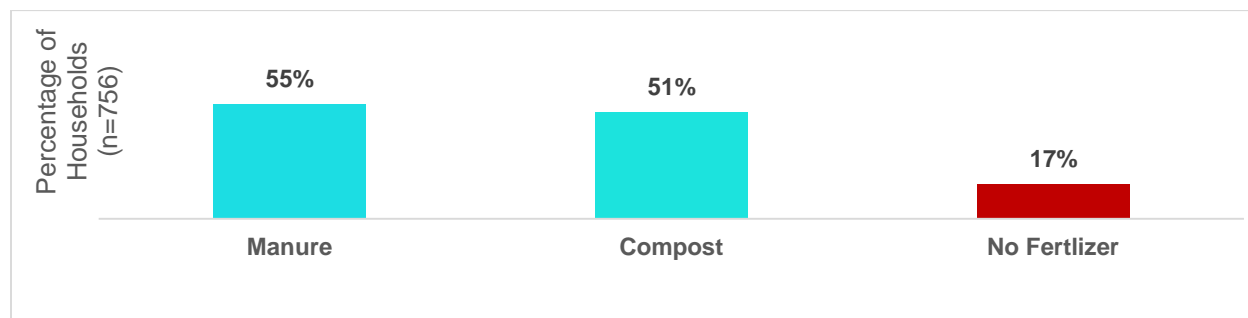
At baseline, 75% of the households passed the nutrition best practice. 85% of households had healthy, green leaved coffee and a high proportion of households (87%) reported having applied compost or manure to their coffee in the past one year (no other fertilizers were used). Notably, while manure is applied by 55% of farmers, only 30% of households own donkeys, mules, or cows that could produce manure on-site.

Additionally, it must be noted that these figures are constructed using a combination of self-reported and observed data. For example, of the farmers who self-reported using compost (n = 365) or manure (n = 349), only 7% and 30% were observed to have a compost pit/heap or pile of manure on site respectively. Conversely, 6% of farmers who reported not using compost, and 18% of the farmers who reported not using manure were later observed by the enumerator to have the corresponding material on-site. In the latter case, farmers were considered to be using compost or manure as

fertilizer, even though they self-reported differently. This high adoption rate may therefore not be an accurate presentation of active farm management among households.

Coffee Farm College will teach farmers how to make compost from farm organic matter, including manure, and the benefits of applying compost to their coffee.

Figure 16. Fertilizers Used in the Past One Year – Self Reported & Observed (multiple select)



WEEDING

Weeds can have a severe impact on yield and therefore, fields should be kept as weed-free as possible throughout the year. Adoption of the weeding best practice requires that farmers weed at least twice a year, there are few or no weeds under the tree canopy, any existing weeds are less than 30cm tall, and the area under the canopy has not been dug.

While digging is a common and traditional practice in some areas of Ethiopia, such as Sidama, it can damage the all-important feeder roots, introduce coffee wilt disease, and leave the soil open to erosion, so is not recommended. In the Gedeo area, however, it does not seem to be widely practiced, which also reflects in the high adoption rate of weeding as a best practice. Nonetheless, it must be considered that data was collected during the dry season, when weeding pressure is low and weeding by digging might not be necessary. The TechnoServe field team estimates that digging under tree canopy might be considerably more common once weeding activities start.

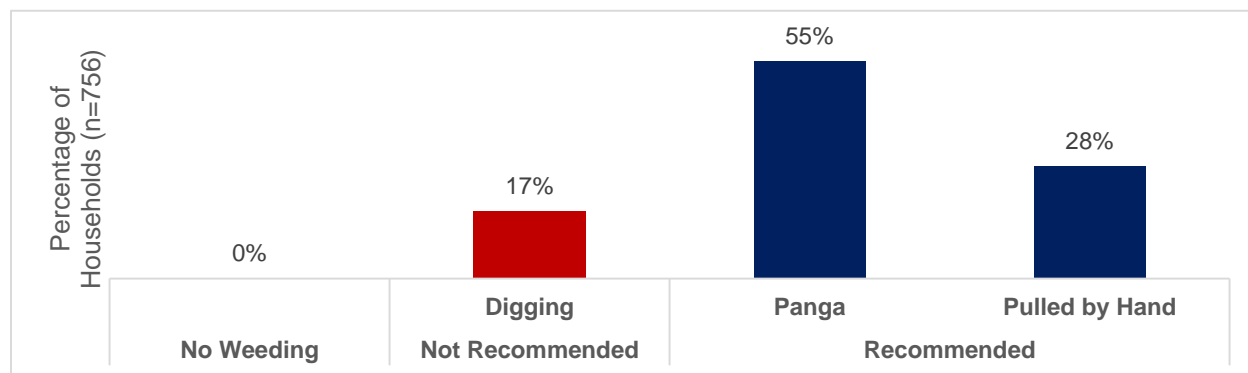


Figure 17. Coffee Field Weeded by Digging

At baseline, 80% of households adopted the weeding best practice. 98% of households report weeding at least twice a year, while only 17% have been found to have dug under the tree canopy. The survey mostly took place during the dry month of March, when weed pressure is low.

The Coffee Farm College will teach farmers the importance of weeding under the canopy by hand-pulling and mulching to reduce the incidence of weeds, and between the rows either slashing or using intercrops such as beans.

Figure 18. Common Weeding Methods under the Tree Canopy



OTHER AGRONOMY PRACTICES

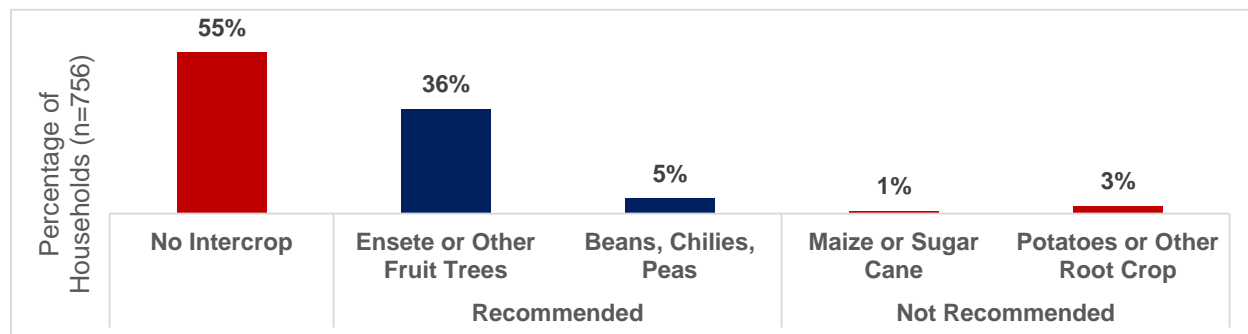
This section discusses other agronomy practices that are not considered as critical Best Practices, or do not apply to all farms, but are assessed, as applicable, for each of the farms visited.

INTERCROPPING

Intercropping has two key benefits: diversification of income and usage as a cover crop during the rains to reduce the incidence of soil erosion. Farmers should intercrop coffee fields with fruit trees such as Ensete (false banana), and can intercrop new or stumped fields, where there is more light reaching the soil, with legumes, such as beans. Farmers are not encouraged to intercrop with root crops that require the field to be dug for harvesting or greedy crops such as maize or sugarcane.

At baseline, 45% of households were intercropping their coffee fields, with almost all of those farmers who intercropped using exclusively appropriate crops (92%), while 8% of those who intercropped all farmers were doing so with non-recommended crops. The most common intercrop was Ensete or other fruit trees (36% of all farms).

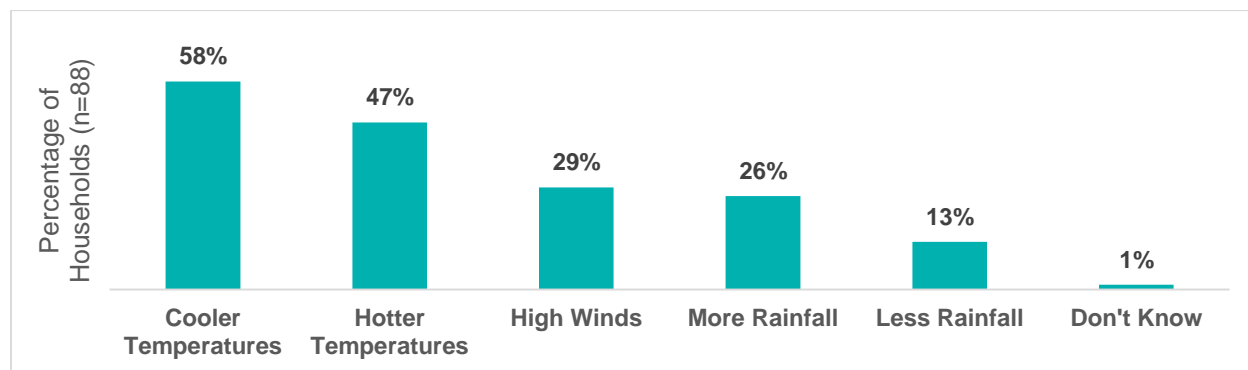
Figure 19. Intercropping at Baseline, all farmers



CLIMATE CHANGE

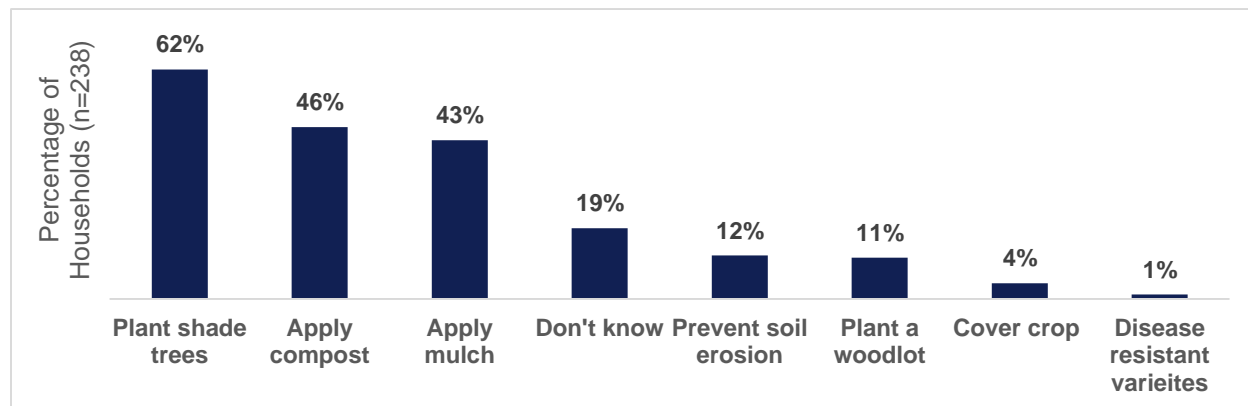
The survey assessed farmers on their knowledge of the concept of climate change and its implications. At baseline, 32% of respondents answered that they had already heard about the term climate change. When asked about whether climate change is affecting their community, 37% of those who previously heard about climate change respondents answered affirmatively, while 63% reported that climate change did not affect their community.

Figure 20. Perception of Weather Patterns Affected by Climate Change at Baseline (multiple select)



Farmers who stated that climate change does affect their community (n = 88) were asked about the change in weather patterns they observed as a result. Changes in temperature are observed most frequently (compare Figure 20 above).

Figure 21. Agronomy Practices Known to Reduce Impacts of Climate Change



Finally, farmers who had heard the term Climate Change before (n = 238) were assessed on their knowledge of agronomy practices to implement on their farms to reduce the impacts of climate change. The most commonly known practice is planting shade trees (62%), followed by the application of compost (46%) and mulch (43%). 19% were not able to name any practice to reduce Climate Change impact, while 12% and 11% knew about erosion control and woodlots (for firewood) respectively.

HOUSEHOLD CHARACTERISTICS

The following sections provide a profile of the average household covering demographic, socio-economic and financial information on the entire baseline sample of 756 households.

HOUSEHOLD COMPOSITION AND FARMER AGE

This section describes the basic demographics and structure of a typical (average) household.

Households have, on average, six members, four of which are children (<1 up to 18 years old). Female farmers are likely to be in their thirties and male coffee farmers are likely to be in their forties, with a mean age of 37 for women and a mean age of 44 for men.

Figure 22. Distribution of household size.

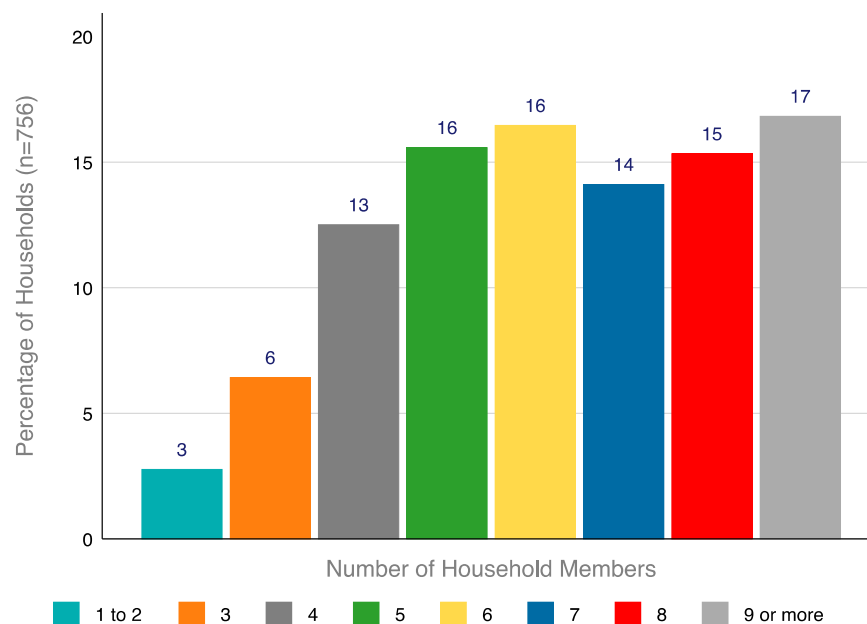


Figure 23. Distribution of number of children.

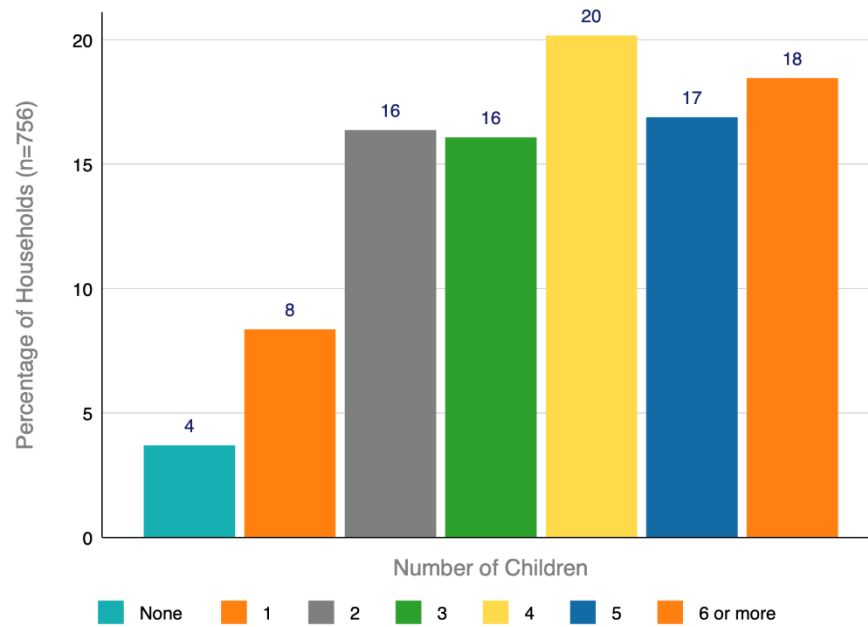
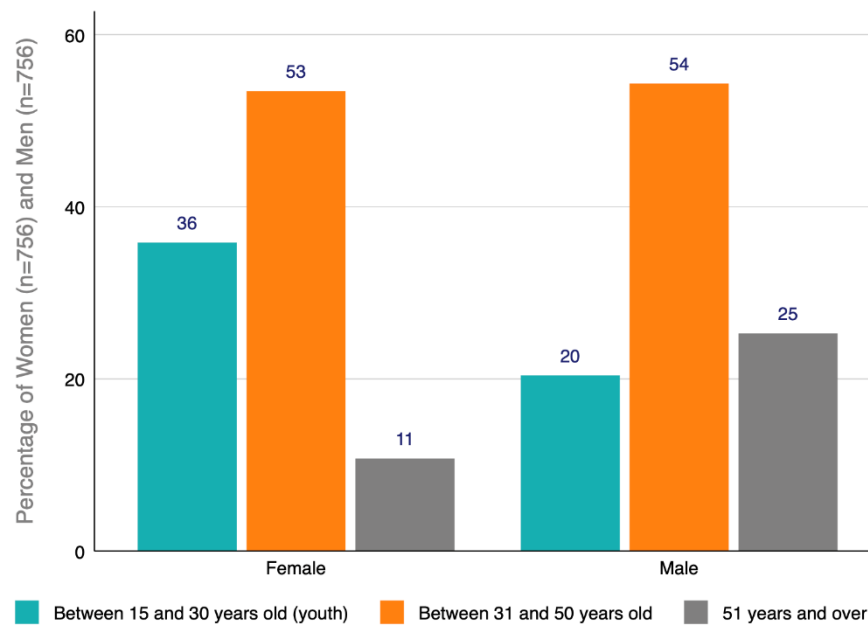


Figure 24. Distribution of ages by gender.

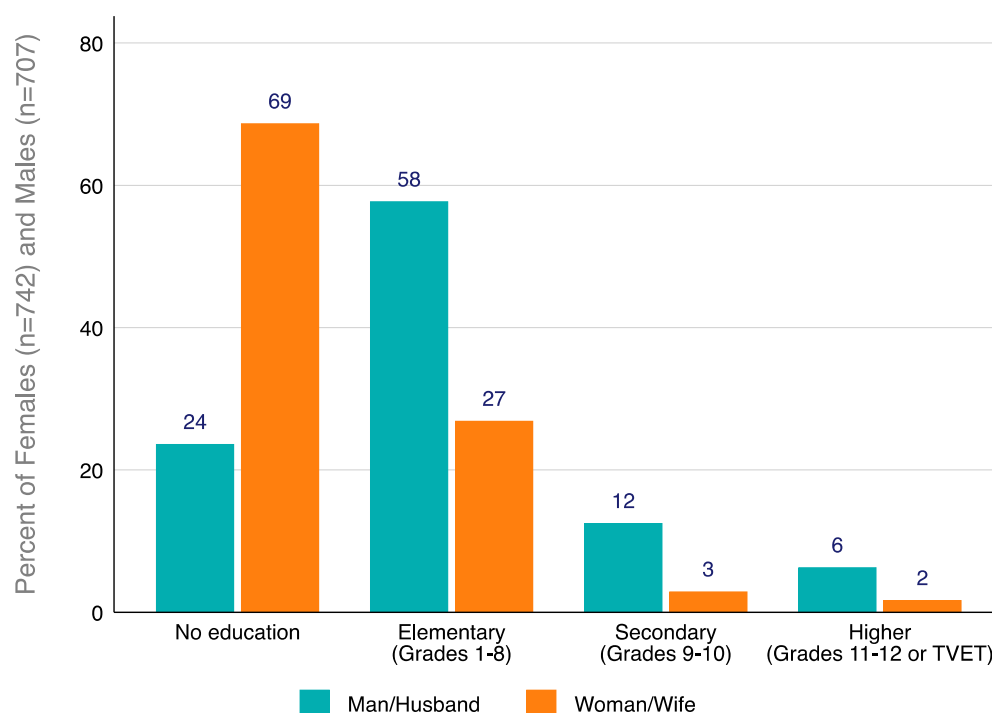


EDUCATION

Overall, the level of education is low for women but higher for men, with around 32% of the women and more than 77% of the men having received at least some level of formal education. Men are generally better educated, with over 18% of the male farmers having education above Grade 8, compared to only 5% of the women.

Moreover, around one quarter of the women (26%) self-report that they are literate (can read and write in at least one language), compared to 72% of the men.

Figure 25. Level of education by gender.



Among the farmers' children, 74% of the school-aged children in a household (6-14 years old) are reported to be attending school, with marginal differences – not statistically significant – between male children (76%) and female children (72%).

COOPERATIVE MEMBERSHIP

More than half (55%) of the male farmers are members of a cooperative, while this figure stands at 22% for female farmers. The overall household cooperative membership is 57%, meaning that females usually belong to a cooperative if their husband is also a cooperative member, except for 2% of women who are members of a cooperative even if the husband/man is not.

LAND OWNERSHIP

Farmers own a mean of one hectare (median 0.69 hectares) of total agricultural land, with almost 40% of respondents owning at least one hectare of agricultural land. Moreover, farmers dedicate a mean of 0.7 hectares (median 0.5 hectares) to coffee farming, or 83% of farming land, across an average of two coffee fields.

Figure 26. Distribution of total farm size in hectares.

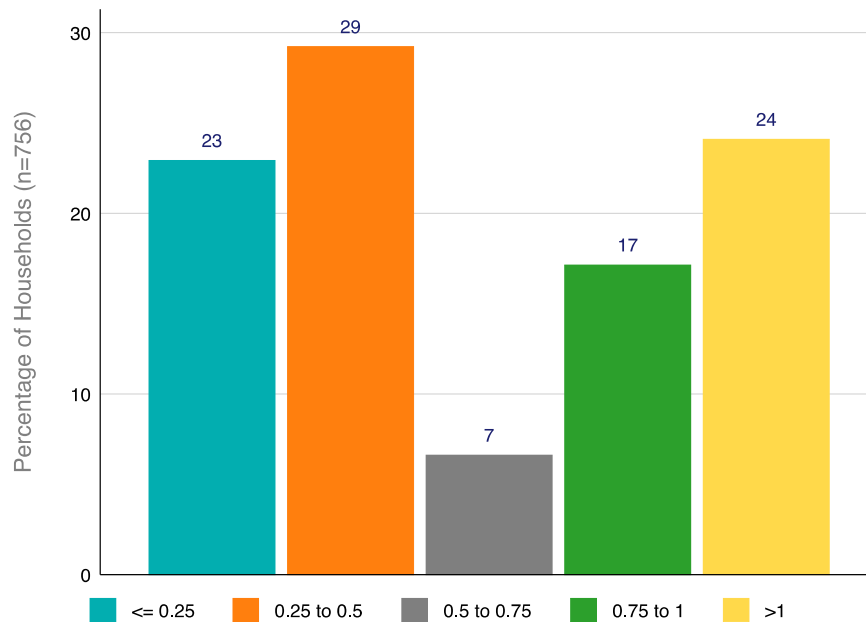
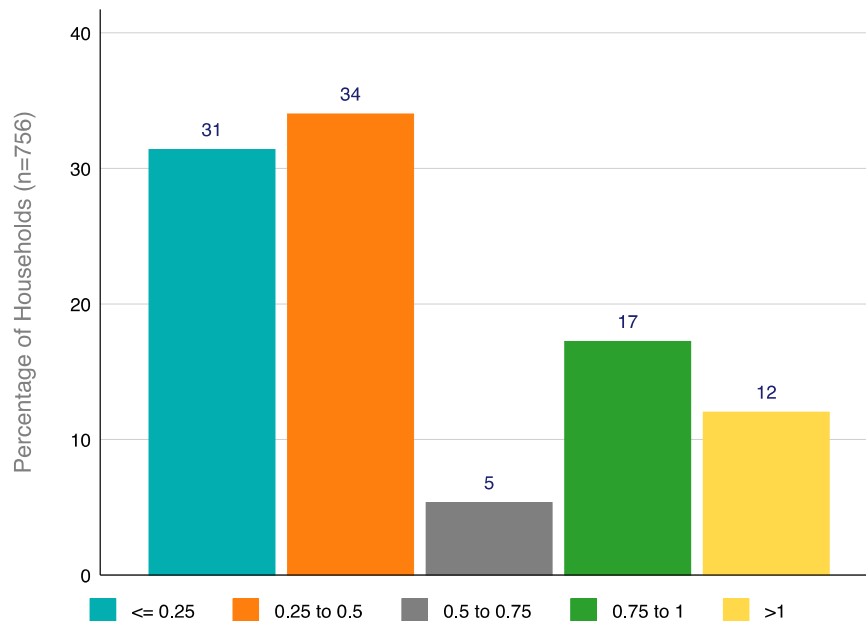


Figure 27. Distribution of coffee farm size in hectares.



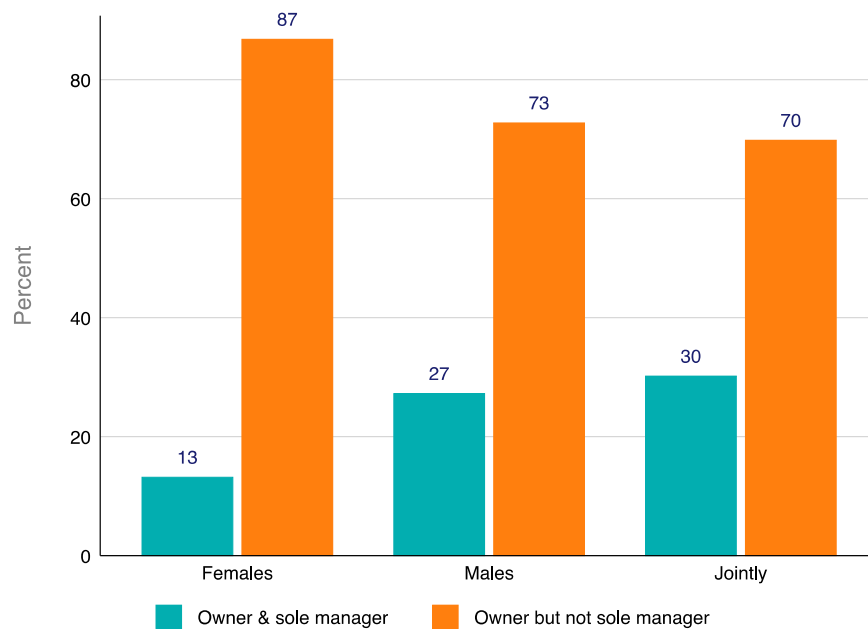
FARM MANAGEMENT AND OWNERSHIP

Coffee farms in the surveyed households are largely either managed by the male farmer (48%) or jointly by the male and female farmers (41%). The remaining farms are managed solely by the female farmer (10%), or jointly with other family members (<1%, 6 respondents).

In terms of farm ownership, over half (52%) of the surveyed farms are owned by the husband/man, while around two-fifths (39%) are jointly owned by husband and wife and the remainder is either owned by the woman (8%) or jointly with other family members (<1%, 5 respondents).

In addition, Figure 5 shows different patterns in terms of ownership and management style depending on the gender of the owner of the farm. For example, when the woman/wife is the only owner, she is the sole manager in around 13% of the cases, whereas 87% of times management is carried out by or shared with the husband or performed jointly with other family members. Male farmers both own and are the sole managers of the farm in 27% of cases, whereas they share management (or do not manage at all) in 73% of cases. The vast majority (70%) of jointly owned farms are managed by either spouse or jointly with other household members.

Figure 28. Pattern in ownership and management.⁶



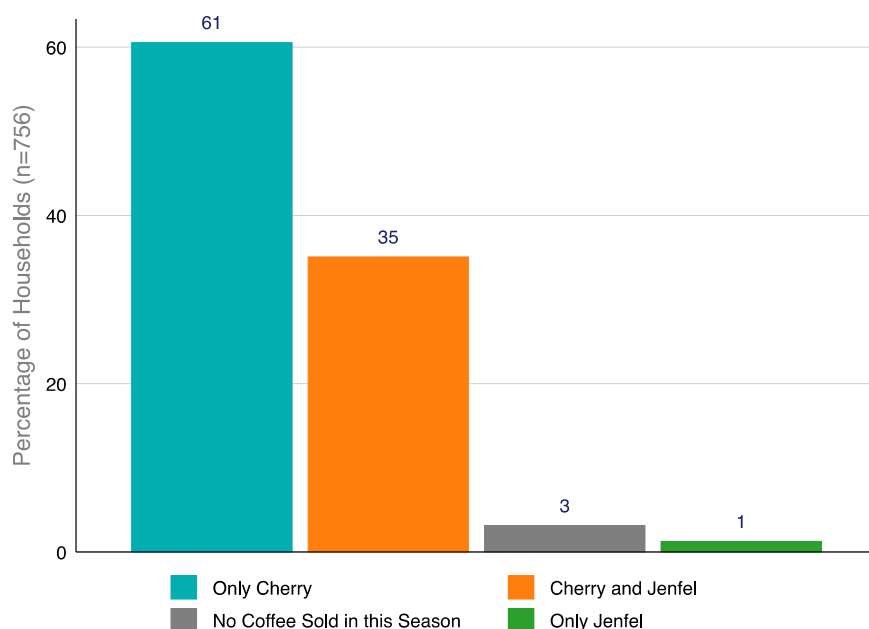
⁶ Farmers owned jointly with other household members are not reported on the graph as they accounted for less than 1% of observations (5 observations).

COFFEE PRODUCTION AND SALES

Production data was collected in kilograms of cherry and jenfel (sun-dried coffee) produced during the 2021 harvest season. This data is self-reported and can be seen as indicative, given limited record keeping and the tendency to round production to the nearest 10 or 100 Kg.

The vast majority of households (97%) reported having sold coffee in the past harvest season. 61% of households sold only cherry, with over a third of the households (35%) selling both cherry and jenfel, and 1% of the households only selling jenfel. The remaining 3% of households had not yet sold any coffee, keeping jenfel for home consumption or sale later in the year

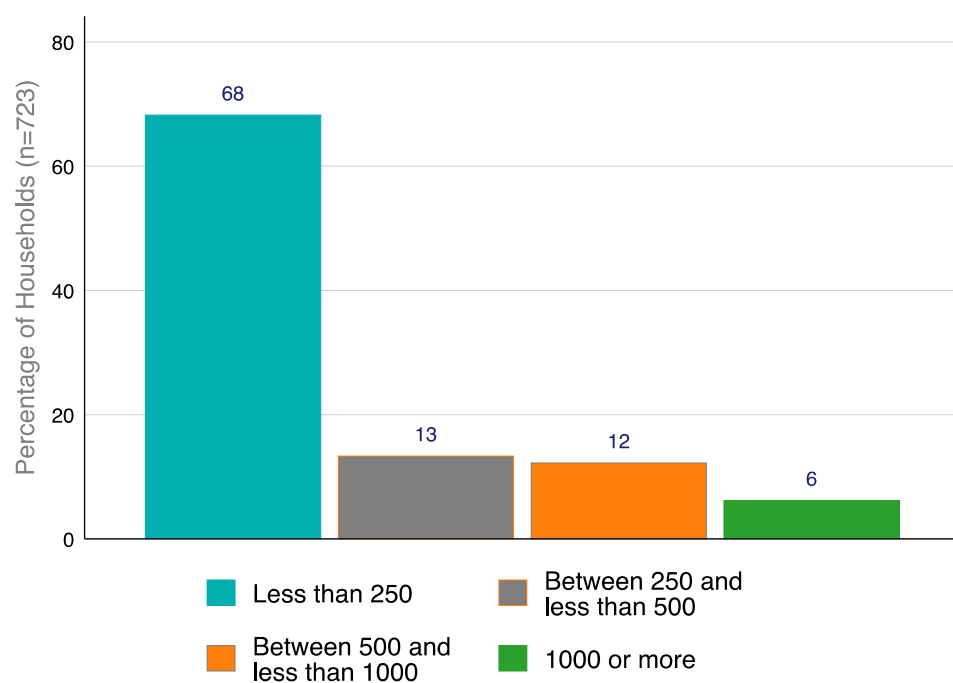
Figure 29. Coffee sold by type.



Overall, households produced an average of 319 Kg (median 150 Kg) of cherries, for an average and median price of 40 ETB per Kg. In relation to jenfel, production averaged 92 Kg (median 50 Kg) of cherries, for an average price of 96 ETB per Kg (median 100 ETB per Kg)⁷.

⁷ To compare production and price received between jenfel and cherry, an approximate conversion rate of 3:1 (jenfel to cherry) can be used).

Figure 24. Distribution of Coffee Production in Kg Cherry (self-reported)⁸.



⁸ Only including households that produced coffee.

COFFEE OPINION

Overall, households appear positive about the future of coffee in their community. Over three quarters of the farmers (78%) report that they would be either happy or very happy if their children became coffee farmers compared to 18% that report they would be unhappy or very unhappy.

When asked about their opinion on the future of coffee farming, almost all (93%) of the farmers assess the future to be very positive or positive. Only 4% assess it as negative or very negative. The remaining 3% of the farmers state that their opinion is neutral.

Figure 30. Opinion on children becoming coffee farmers.

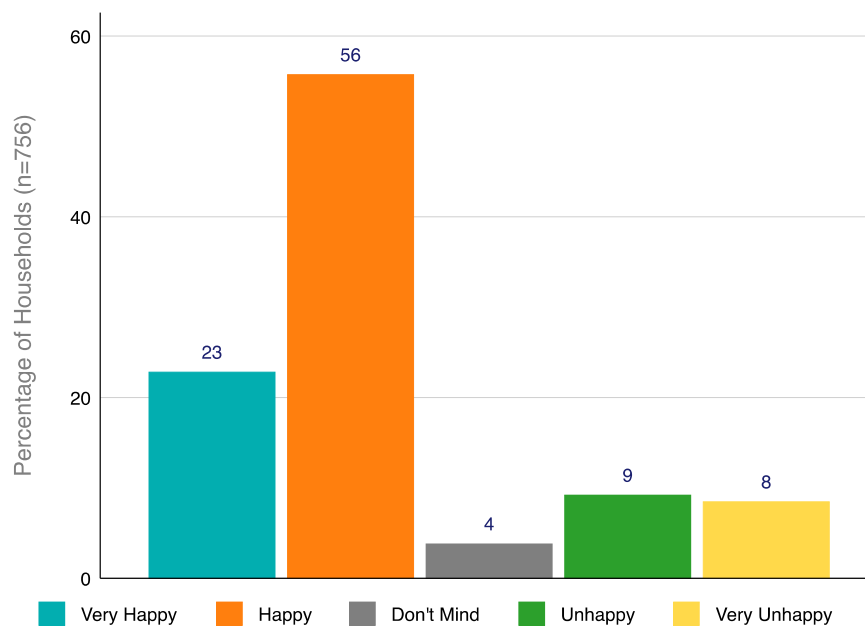
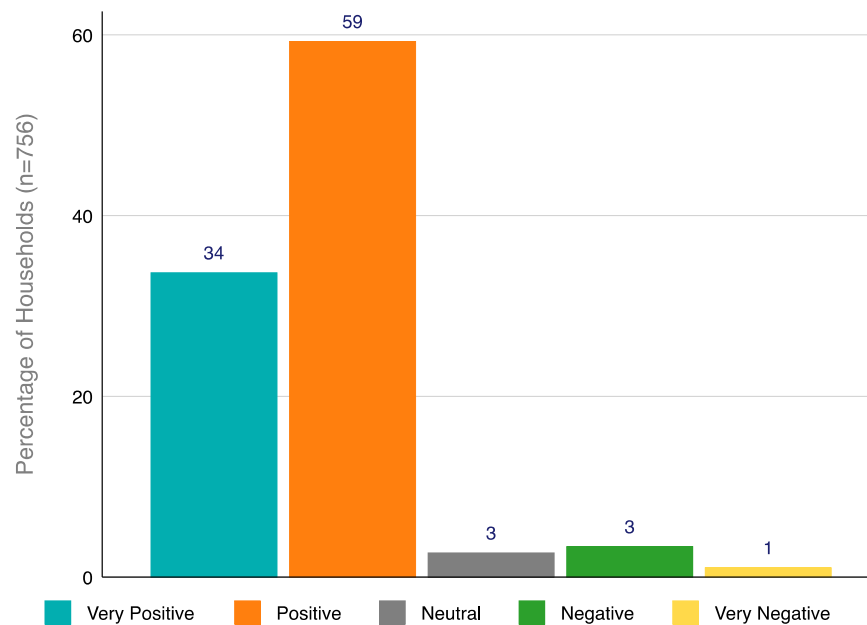


Figure 31. Opinion on the future of coffee farming.



ASSET OWNERSHIP

The baseline survey also measures sample household's asset ownership, which includes household assets, livestock, and assets used for communication and transportation. It also assesses the quality of sampled households' dwelling.

Around 64% of the houses have corrugated iron roofs, while less than 30% have floors made of materials other than mud or dung, and less than 1% have walls made out of cement or with cement overlay. Around 53% of the households do not have access to electricity, and all cook with either collected or purchased firewood, which can be detrimental to physical health. Additionally, none have access to an improved toilet,⁹ and around 59% of the houses have an improved water source.¹⁰

The main source of drinking water for surveyed households are protected dug wells or springs, used by 63% of the households, followed by unprotected dug well or spring (16% of households), rivers, lakes, ponds or canals (8%), and tube wells and boreholes (7%). Women and children are mainly responsible for fetching water in 57% and 38% of households, respectively. The round-trip journey to fetch water was 28 minutes on average, but for some households, this took as long as 90 minutes.

Most households have some livestock, with 51% of households owning at least one chicken, 39% owning at least one sheep, and 29% owning cattle. Ownership of goats, donkeys and mules stand at

⁹ Improved access to sanitation consists of ventilated improved pits, flush toilets, or composting toilets that are not shared with other households.

¹⁰ Improved water access consists of having access to a protected dug well or spring, tube well, water tank, or a public or private tap. If the water source is not at the house, it should not be more than a 30-minute roundtrip.

less than 3%. In terms of Tropical Livestock Units (TLUs)¹¹ (IFPRI, 2005), the average household owned 0.65 TLUs, lower than the average of 2.0 TLUs in rural Ethiopia (FAO, 2018).

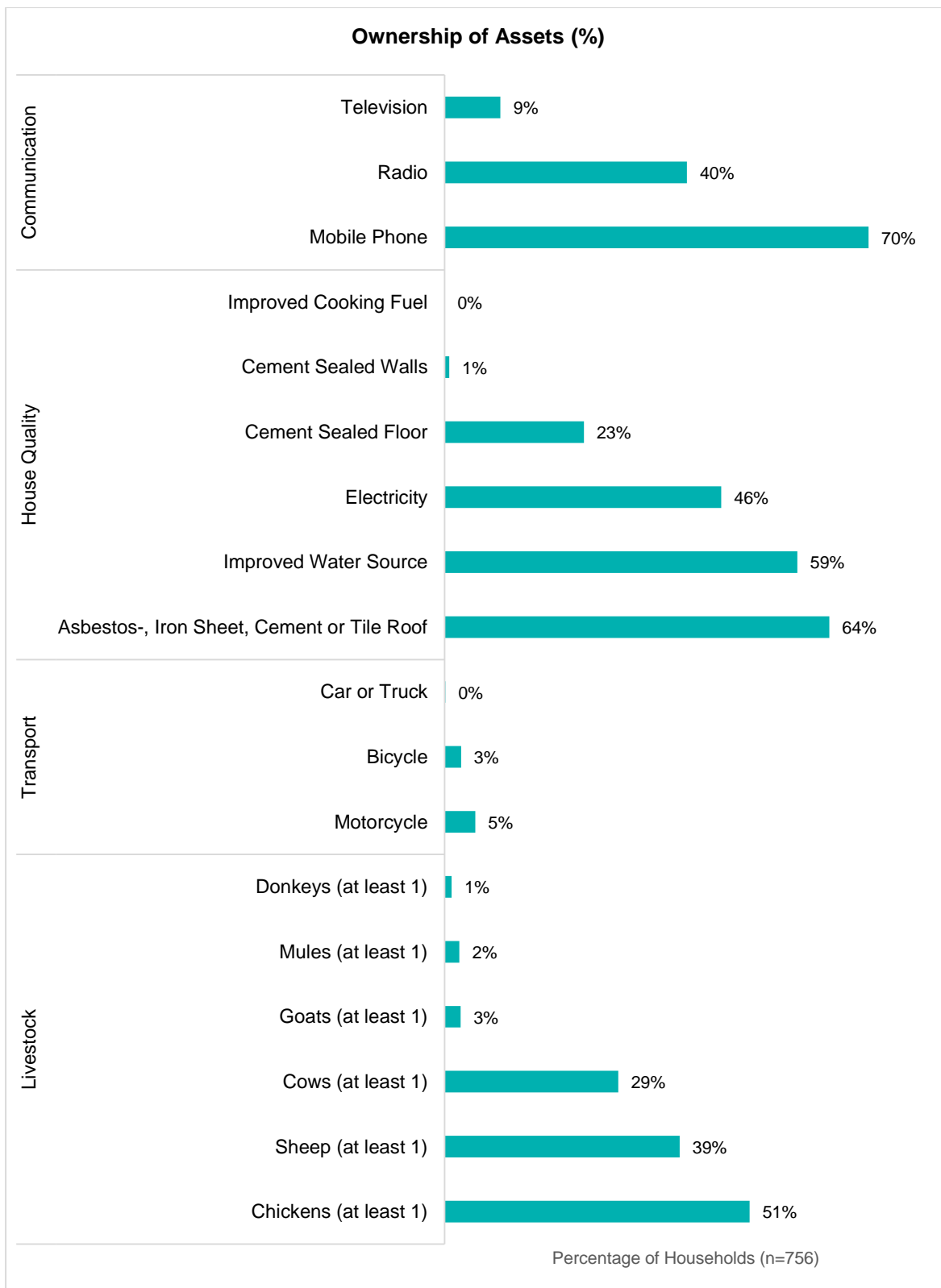
Ownership of communication devices is relatively high in the program area, with 70% of households owning at least one mobile phone, and on average possessing 1.5 mobile phones. Households mostly use their phones for making calls (99%), using it as a torch (37%), listening to music (36%), receiving messages (34%), and listening to the radio (32%).

Two fifths (40%) own a radio, while 9% owns a television and none own a refrigerator. Most coffee households do not own their own means of transport; 5% of households own a motorcycle, 3% of households own a bicycle and less than 1% (1 observation) own cars or carts (1 observation and 5 observations, respectively).

Finally, 90% of households own one or more axes (gejera).

¹¹ Tropical Livestock Units are livestock numbers converted into a common unit based on the regional average weight of the livestock type. The conversion rates for livestock captured in this survey are the following: cow = 0.7, chicken = 0.013, goat and sheep = 0.13, mule and donkey = 0.7.

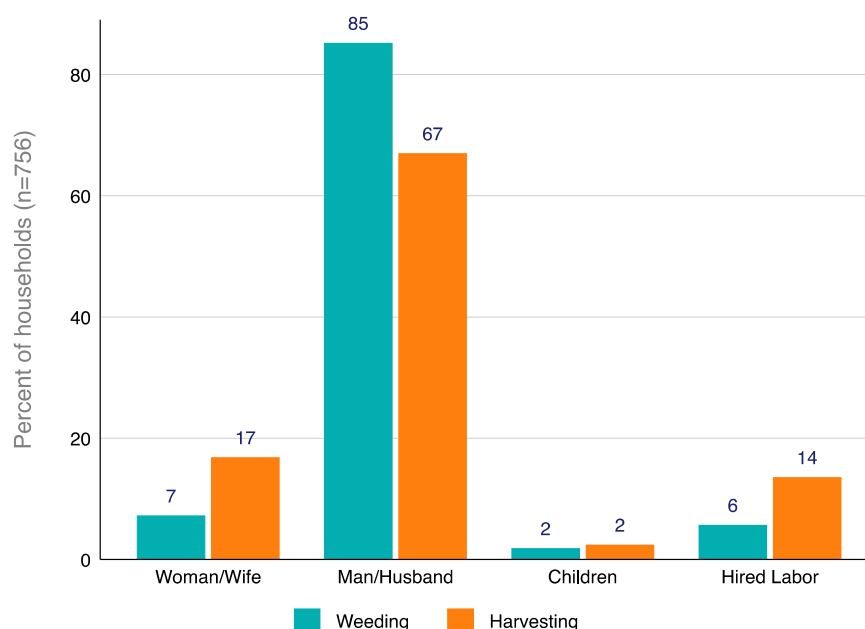
Figure 32. Ownership of Key Assets



HOUSEHOLD LABOUR, PAID LABOR AND CHILD LABOR

Analysis of household labor showed that most common farm activities were conducted by the man/husband, with the woman/wife, hired labor and children playing a significant but minor role, as shown in Figure 33.¹²

Figure 33. Responsibility of farm activities in the household.



Self-reported data indicates that the man was the primary household member involved in weeding the coffee farm in 85% of households, whereas women were the most responsible ones in 7% of households. At the same time, hired labor and children were the primarily responsible in weeding in 2% and 6% of households, respectively. In relation to harvesting, men were those most involved in 67% of households, women in 17% of households, children in 2% of households, and hired labor in 14%.

Almost half (49%) of the households had hired paid labor to work on their coffee farm in the past one year, with the average reported wage of 76 ETB for an eight-hour workday, equivalent to \$1.47 USD.¹³

Around 8% of the households with school-aged children (6-14 years old) report that their children work on the coffee farm, while 5% stated hiring labor below 14 years of age. This poses a regular challenge for 4% of children as it prevents them from going to school, while this is the case for 26% of children only occasionally – e.g. during harvest season. Nevertheless, 67% of school-aged children do not appear to have their schooling duties affected by their work on the coffee farm. Furthermore, over 31% of household members aged 18 or younger are reported to be involved in using slashers

¹² Intra-household labor allocation might be affected by who is being interviewed. For this survey, both the wife and husband were interviewed for 57% of the households, only the husband for 32% of the households, and only the wife for the remaining 11%.

¹³ Using the official exchange rate of 1USD = 51.62 ETB as of May 3, 2022.

or pangas in the coffee field, 2% are reported lifting or carrying heavy weights (>20kg) for a distance greater than 3km, whereas less than 1% (one observation) is reported as using pesticides.

ENVIRONMENTAL RESPONSIBILITY

There are no prevalent signs of ecosystem destruction, as deforestation was the only destructive activity, and it was observed in less than 1% of respondents (4 observations). Finally, no households report hunting unspecified animals.

Around 11% of households have a river or stream passing through their property. Around 2% of these households report disposing of soil or stones in the waterway, as well as plant material.

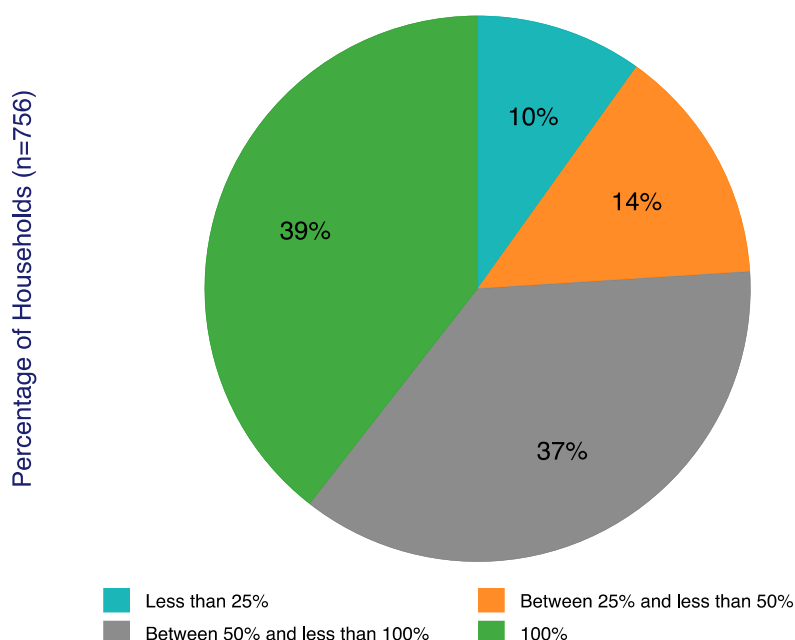
FINANCIAL PROFILE

This section is dedicated to understanding the income profile of households. Examining the financial profile of a household is extremely useful to understand the wealth and vulnerability of the household.

INCOME DISTRIBUTION

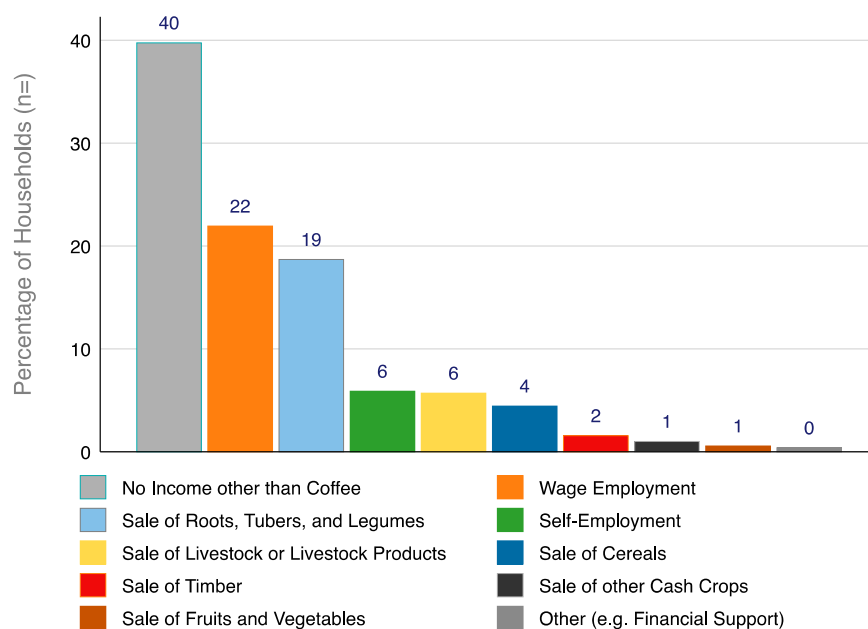
A major program goal of Coffee Farm College is to increase incomes and reduce poverty through increased coffee production and sales. The following graph shows the dependence of households on coffee for income based on self-reported data.

Figure 34. Portion of Total Household Income from Coffee



Many coffee farming households are substantially dependent on coffee, with 76% of the households reporting that coffee makes more than half to all of their income. Other major economic activities in the area are: (i) wage employment (22%), (ii) the sale of roots and tubers (19%), (iii) self-employment (6%), (iv) sale of livestock and livestock products (6%), and (v) sale of fruits and vegetables (4%). A small proportion of the households also reported self-employment (i.e. running a small business) and selling livestock.

Figure 35. Other Income Sources

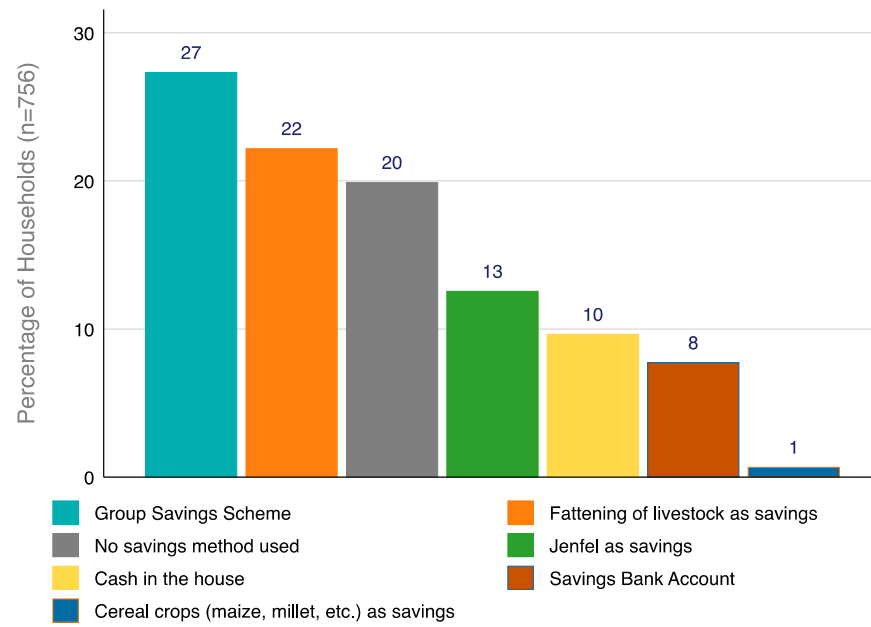


SAVINGS

For any household, savings are an important vehicle for investment and shield against financial shocks and coffee price volatility. Yet, over one fifth (20%) of the households reported that they do not use any method of savings.

Farmers were asked about their main saving methods and 8% of the farmers reportedly save through the formal banking system. Group saving scheme (an association where members meet to save and borrow from group funds) is the most popular saving method in the area, with 27% of the farmers participating in such schemes. While 22% of farmers fatten their livestock as a form of saving, about 13% keep dried coffee (jenfel) as a stock to be sold at a later date, and around 10% store cash in the house.

Figure 36. Savings methods.



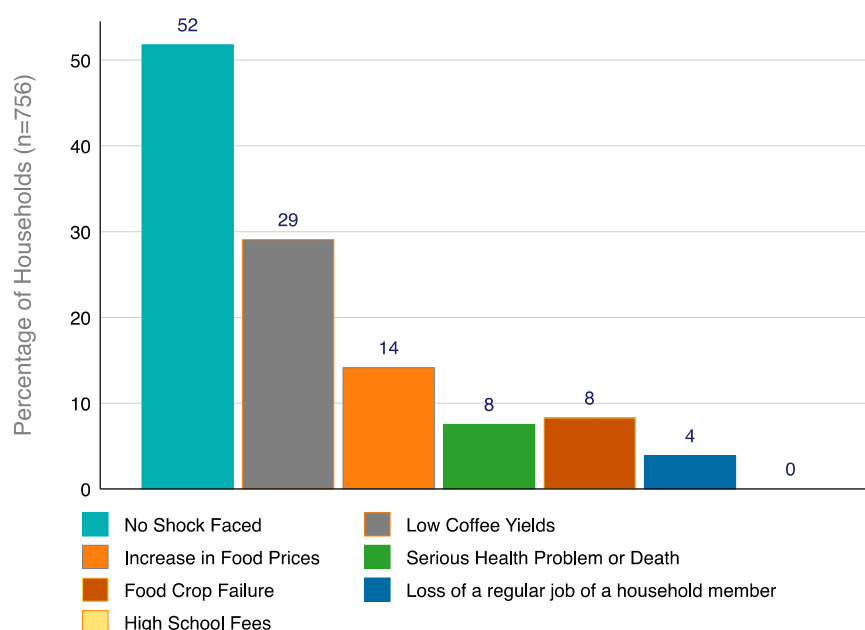
VULNERABILITY PROFILE

This section explores the vulnerability of households by studying the financial shocks and incidence of food shortages faced by farmers.

FINANCIAL SHOCKS

A financial shock or crisis is defined as any event that leads to a serious reduction in the farmer's asset holdings, causing the household income to fall substantially or result in a significant reduction in food consumption. Around 48% of households reported they have been affected by at least one serious financial shock or crisis during the last year.

Figure 37. Common sources of financial shocks faced by households.

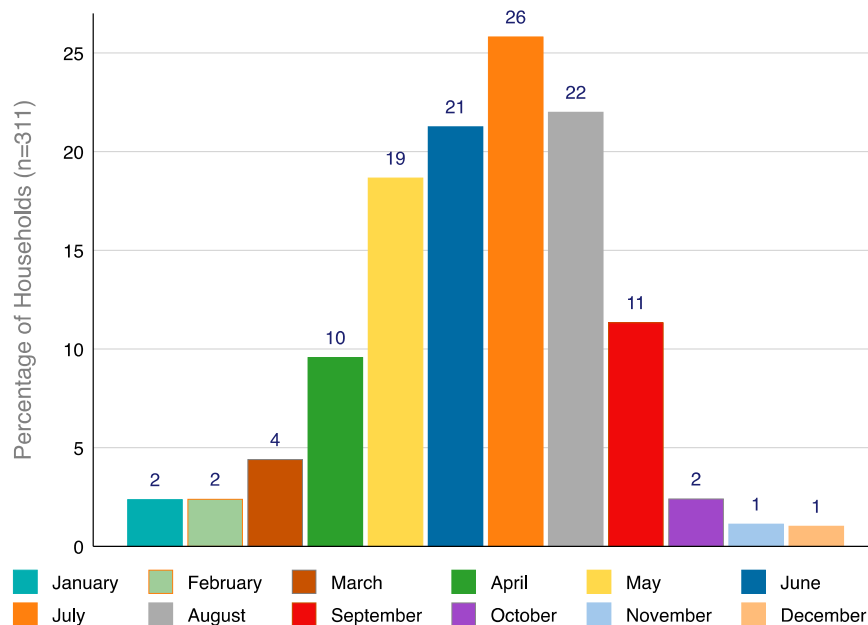


The most common shock faced among farmers in the area during the past year was low coffee yields (29%). Additionally, 14% of the households reported struggling with increasing food prices, while 8% of households also reported serious health problems or death and crop failure.

FOOD SHORTAGES

Food shortages can be debilitating for households, adversely affecting their health and ability to work on their farms. Around two-fifths of the households (41%) report facing food shortages over the last year, for an average of three months (for those facing shortages). The figure below depicts the months of the year in which food shortages were most common. The shortages occurred most frequently in the months from May to August, and especially in July before harvest.

Figure 38. Main months of food shortage for households facing food shortages.



HOUSEHOLD DIET

In order to combine data from a large number of individual food groups, a single index was constructed using a method promoted by the Food and Agriculture Organization of the United Nations (FAO, 2011). The household dietary diversity score (HDDS) reflects, in a snapshot, the economic ability of a household to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food and nutrition security.

The HDDS takes integer values between 0 and 12; the higher the score, the better the dietary diversity. The average household in the cohort has a HDDS of 7, indicating a moderate dietary diversity for most farming households. For comparison, households surveyed in Sidama in April 2021 for had an average HDDS of 8.

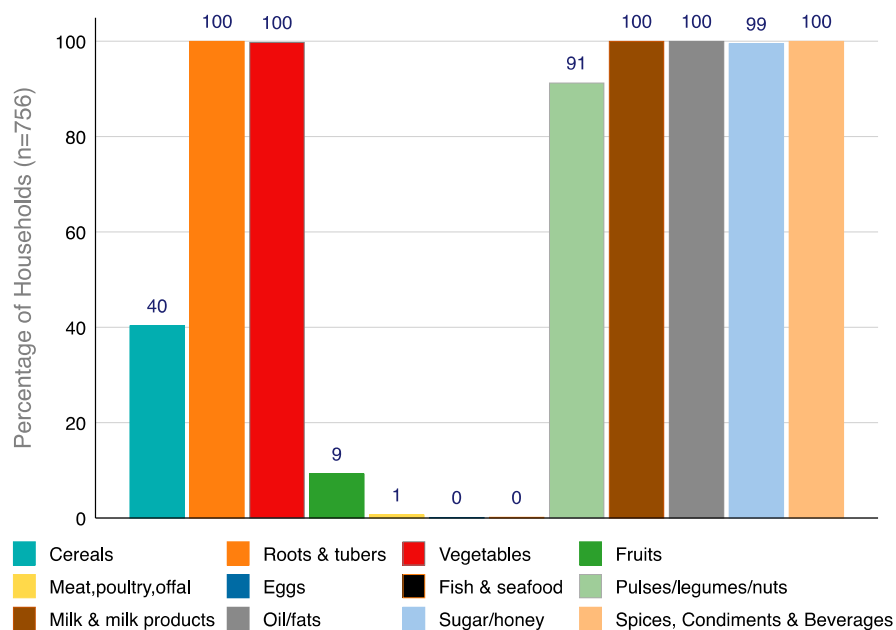
Farmers were asked about what food they had consumed in the previous 24 hours. The food groups consumed by 99% or more of households were roots and tubers, vegetables, dairy (milk and butter used in cooking), fats, sugar and honey, and spices, condiments, and beverages. Other frequently consumed food groups were pulses and legumes (91%). Finally, 40% of households consume cereals such as teff, while 9% reported having consumed fruits, and only a negligible proportion of the households consumed meat (five households), eggs (one household), and fish and seafood (one household).

In terms of specific foods and beverages, coffee and kocho¹⁴ appear to be staples, as they were consumed by around 99% of households. In addition, 91% of households drank water in the previous 24 hours. Notably, beans and Ethiopian cabbage were reported as consumed by 59% and 53% of

¹⁴ Kocho is a bread-like staple food traditional of Ethiopian cuisine.

households, respectively. Importantly, data collection was carried out during fasting season, which may have influenced the results obtained.

Figure 39. Main Types of Food Consumed



GENDER

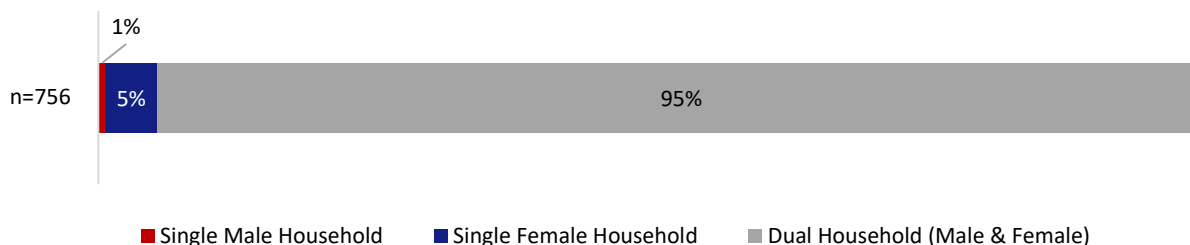
Both the man and woman were interviewed in 57% of households visited, the man was visited alone in 32% of households, and the woman alone in 11% of households. The man and woman managed the coffee farm jointly in 42% of households, compared to only the man in 48% of households, only the woman in 10% of households, and jointly with other family members in less than 1% of households.

In this baseline survey, two modules with gender-related questions were added, which were asked to men and women individually and separately to avoid bias. The first inquires about the distribution of financial decision-making power in the household by asking who typically takes decisions about spending and saving. The second module addresses respondents' attitudes about gender roles and equity via a number of statements which respondents are asked to agree or disagree with. Repeating these modules over time makes it possible to track any change in power distribution or equity perceptions which occurs while the program is implemented. Importantly, this does not allow to draw conclusions about causation because no counterfactual is used for reasons discussed elsewhere in this report.

HOUSEHOLD COMPOSITION

As shown by Figure 40, of the 756 households sampled in total, 95% included both a male and female adult, while 5% and less than 1% were led by single female and male adults respectively. The following results in this section on gender are only presented for dual households with both genders.

Figure 40. Household Composition



FINANCIAL DECISIONS

In this module, respondents were asked household decision-making related to income and expenses, to understand how women can translate participation in the training program into their ability to negotiate intra-household gender roles.

Overall, both genders tend to agree that men are taking most decisions related to spending and saving, except on minor expenses, where both perceive women as being the main decision-maker. However, there are minor patterns of gendered heterogeneity. Firstly, men are more likely to report themselves to take decisions alone or mostly alone than women are to report the same for men. Secondly, the share of women who perceive decisions to be made jointly by husband and wife is typically larger than the share of men.

Assessing responses from men, men believe to be taking most decisions on major expenses (76% report only or mostly husband decides) and least decisions with regard to minor expenses and savings (23% report only or mostly husband decides). On spending coffee income, 70% of men say that they make decisions alone or mostly alone.

Women largely agree with this assessment: 72% of women say men take decisions regarding major expenses alone or mostly alone, while 70% of women see men taking coffee-income-related decisions alone or mostly alone. In turn, only 16% of women state that men take decisions on minor expenses alone or mostly alone. 68% state that they make decisions on minor expenses alone or mostly alone.

Figure 41. Who normally decides how to spend money from coffee sales?

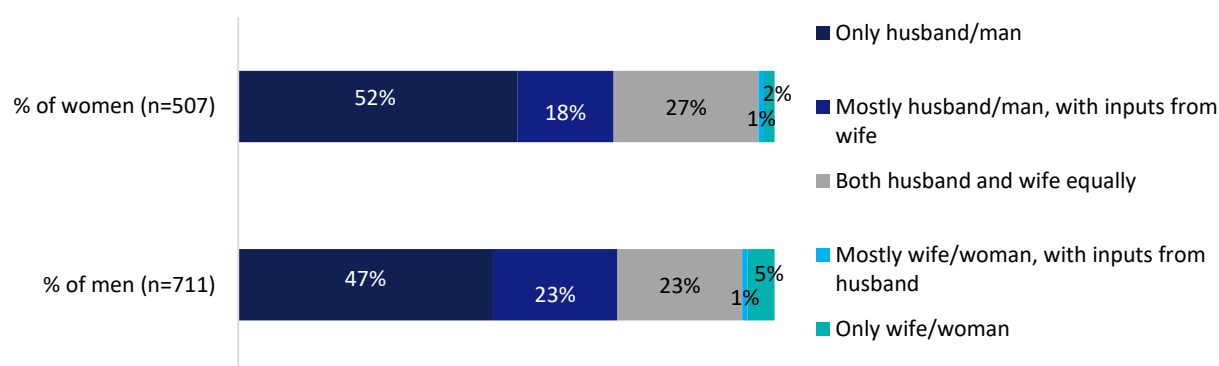


Figure 42. Who normally decides how to spend other/non-coffee income?

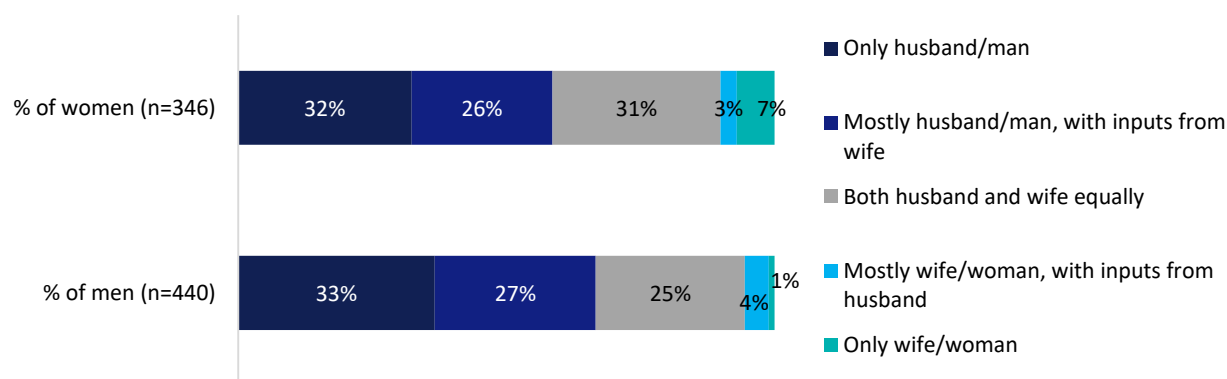


Figure 43. Who normally decides how to spend household income on major expenses?

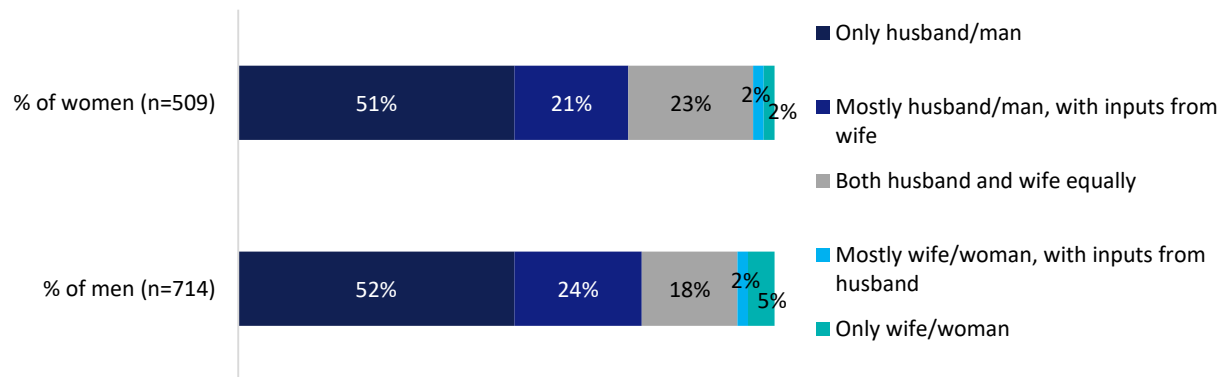


Figure 44. Who normally decides how to spend household income on minor expenses?

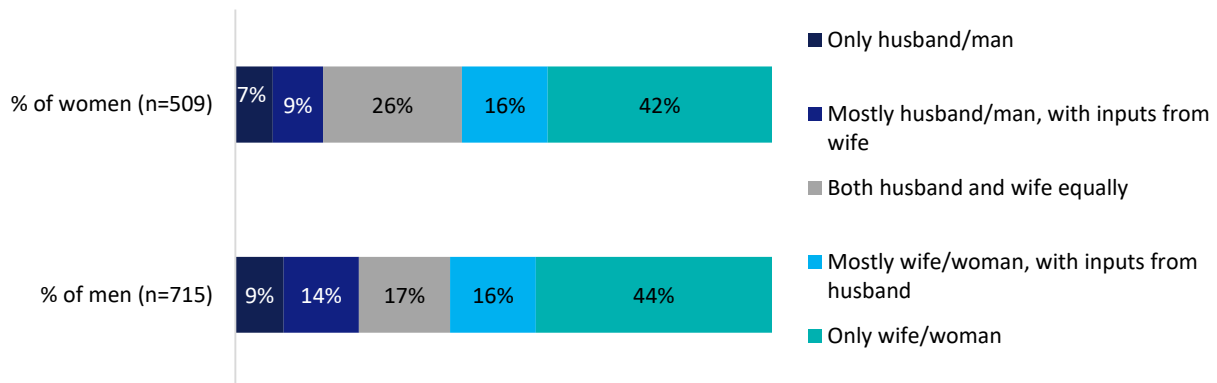
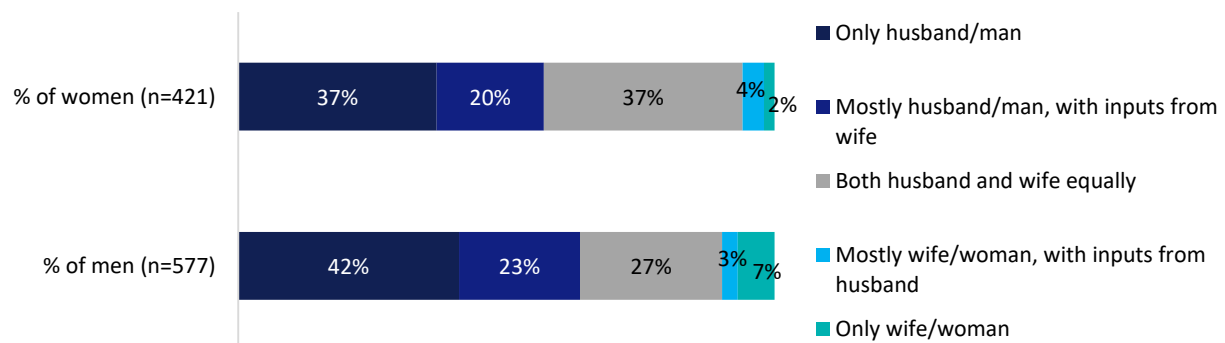


Figure 45. Who is mainly responsible for saving in the household?



FOOD PURCHASING & PRODUCTION

Respondents were also asked two questions related to decision-making on food purchasing and production. The results seem to reflect the same dynamic whereby both genders largely perceive a similar distribution. Women do seem to take more decisions related to food than in most of the other instances investigated above.

Figure 46. Who makes food purchase decisions in the household?

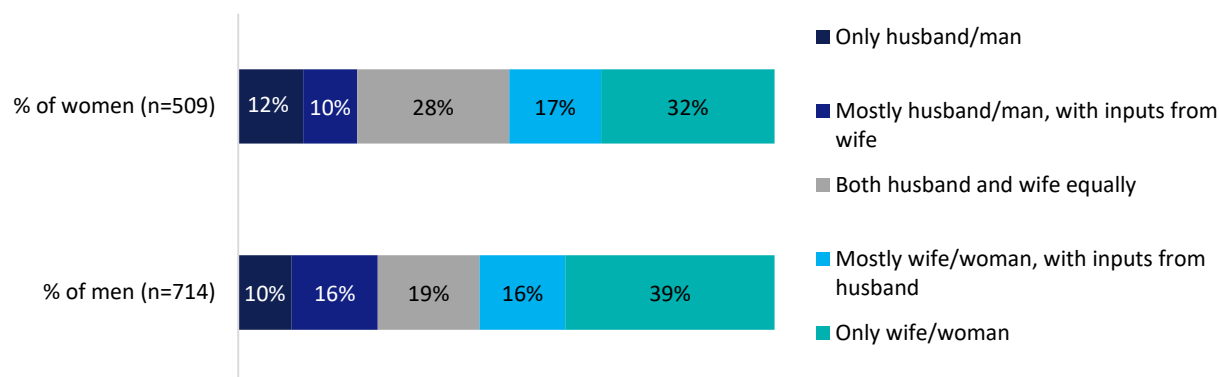
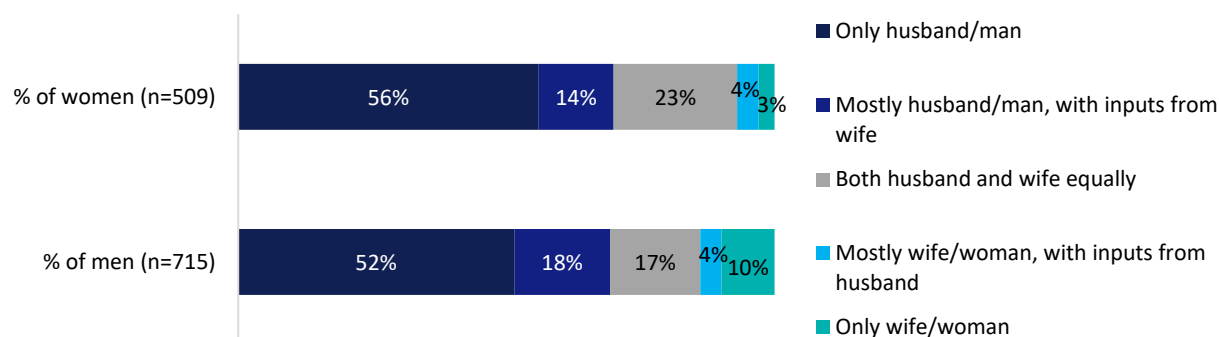


Figure 47. Who participated in production of crops that are grown primarily for household consumption in the last 12 months?



GENDER EQUITY

In this module, respondents were presented with 6 statements which they were asked to rate on a 5-point Likert-scale (strongly agree to strongly disagree):

1. Men and women should have equal opportunities in all spheres of life.
2. Women should have the same chance to earn income as men.
3. Men's and women's contributions to the farm should be equally valued.

4. The husband should help his wife with household chores.
5. Women should play an equal role as men in the financial management of the household.
6. Women should play an equal role as men in the financial management of the coffee farm.

Overall, an overwhelming majority of men and women agree or strongly agree with the proposed statements. Men and women are most aligned in their perception of statement on 1 equal opportunities, statement 4 regarding household chores as well as statement 6 on financial management of the coffee farm.

The statements with the highest percentage of agreement by male respondents are statement 1 on equal opportunities (91% of men agree or strongly agree), as well as statement 2 on income, which 89% of men agreed or strongly agree with (Figure 48). The largest share of disagreement by male respondents is found under statement 4, i.e., whether men should help with household chores, which 24% of men disagree or strongly disagree with.

For women, the statement with the highest percentage of agreement is statement 1 on equal opportunities, which 91% of women agree or strongly agree with (Figure 48). For female respondents, too, the highest rate of disagreement is with statement 4 on household chores, where 24% of women disagree or strongly disagree that men should help.

Figure 48. Men and women should have equal opportunities in all spheres of life.

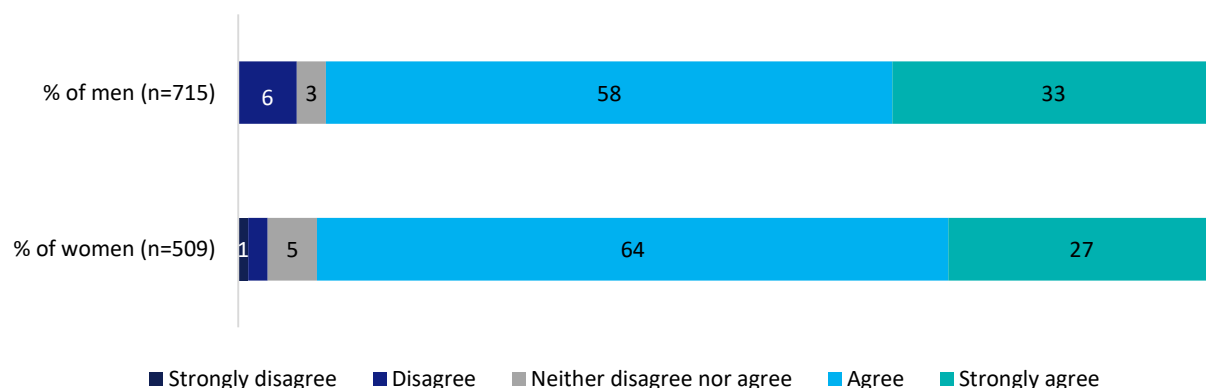


Figure 49. Women should have the same chance to earn income as men.

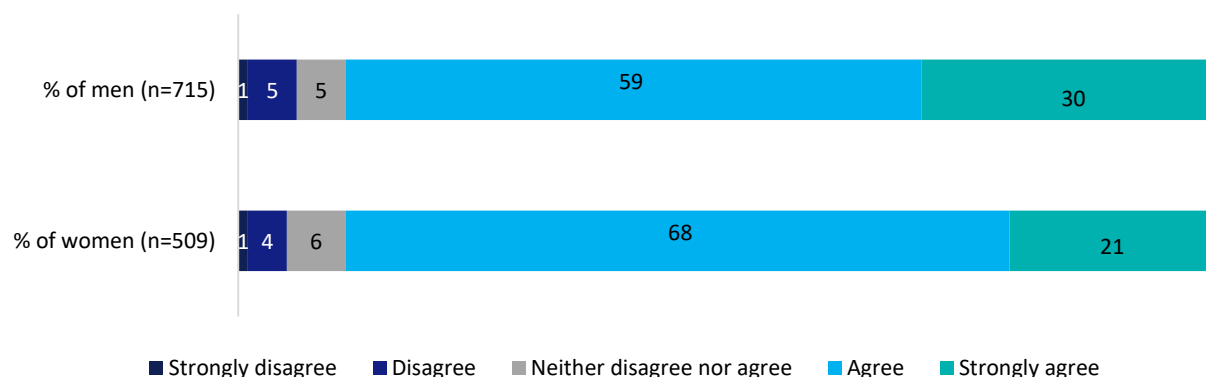


Figure 50. Men's and women's contribution to the farm should be equally valued.

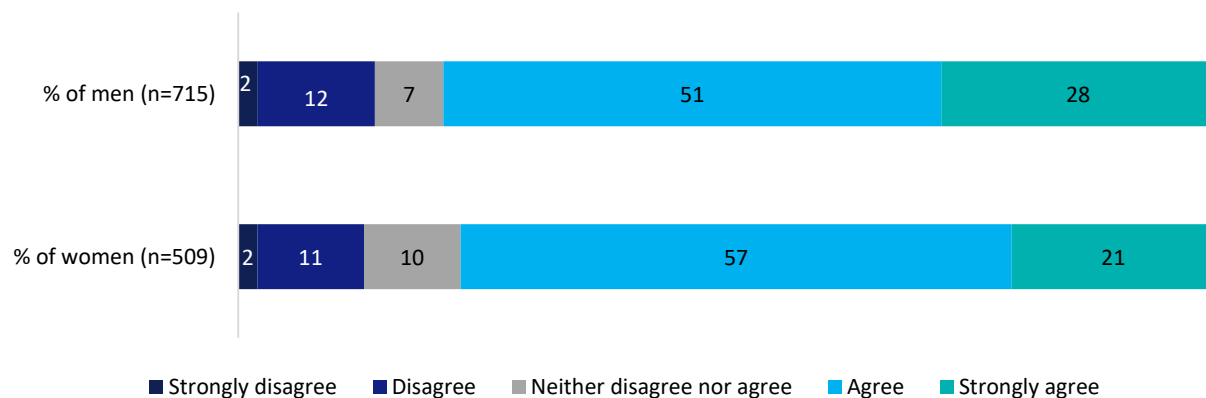


Figure 51. The husband should help with household chores.

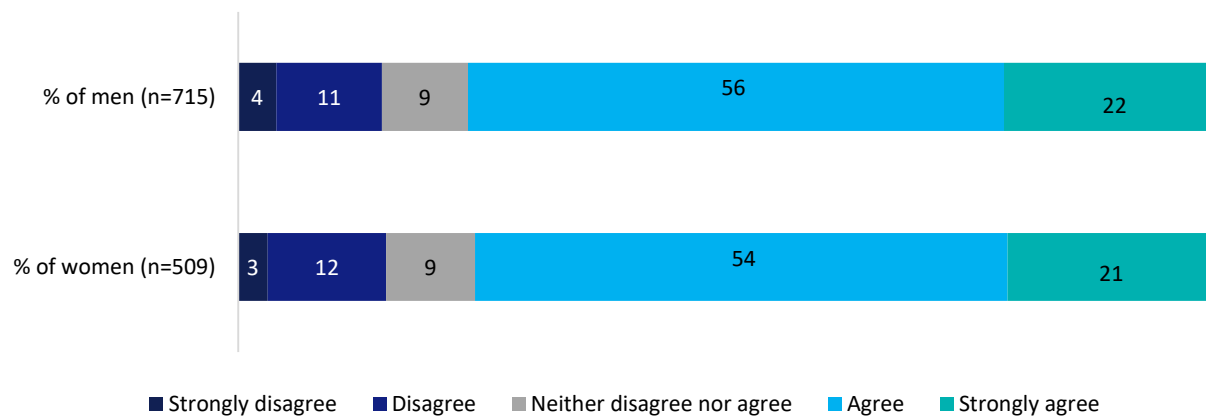


Figure 52. Women should play an equal role as men in the financial management of the household.

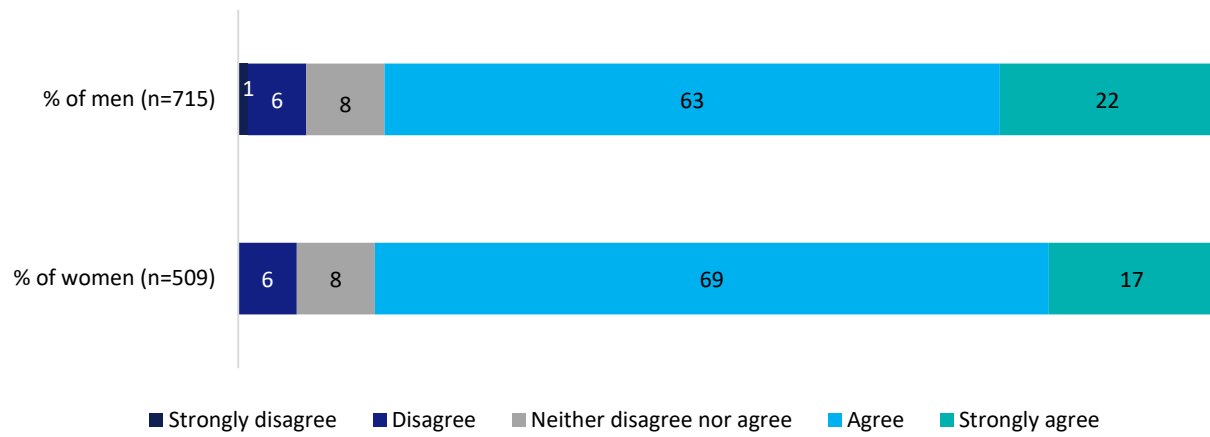
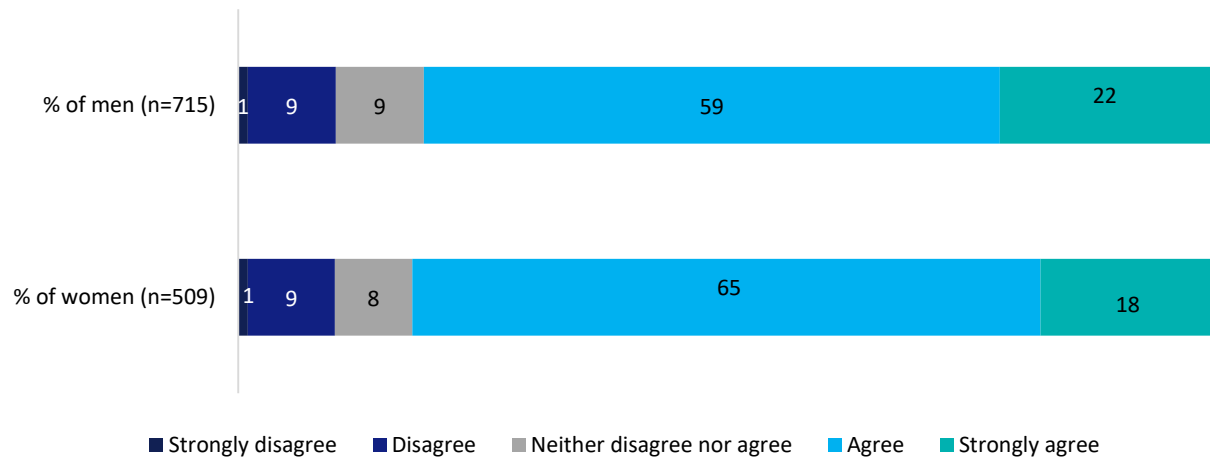


Figure 53. Women should play an equal role as men in the financial management of the coffee farm.



POVERTY ANALYSIS

This section provides a brief overview of two poverty assessment tools – the Poverty Probability Index (PPI) scorecard and the Multi-Dimensional Poverty Index (MPI). The purpose of these poverty assessment tools is to understand the relative poverty profile of the farmers involved in the Farm College program.

POVERTY PROBABILITY INDEX

The PPI scorecard is a poverty measurement tool devised by Innovations for Poverty Actions (IPA) that contains up to ten specific questions that are derived from country-specific, nationally representative household surveys. It is used by hundreds of organizations worldwide, especially NGOs, corporations and social enterprises, and has been customized for many developing countries to date, including Ethiopia.¹⁵

Scores range between 0 (most likely to be below a poverty line) and 100 (least likely to be below a poverty line). The scoring can be used to estimate three basic characteristics. First, the poverty likelihood of a household, which is the probability that a household has per-capita consumption below a poverty line. Second, the score can estimate the poverty rate of a group of households at a point in time using the average scores of each household. Third, it can estimate the changes in the poverty rates of a group of households between two points in time.

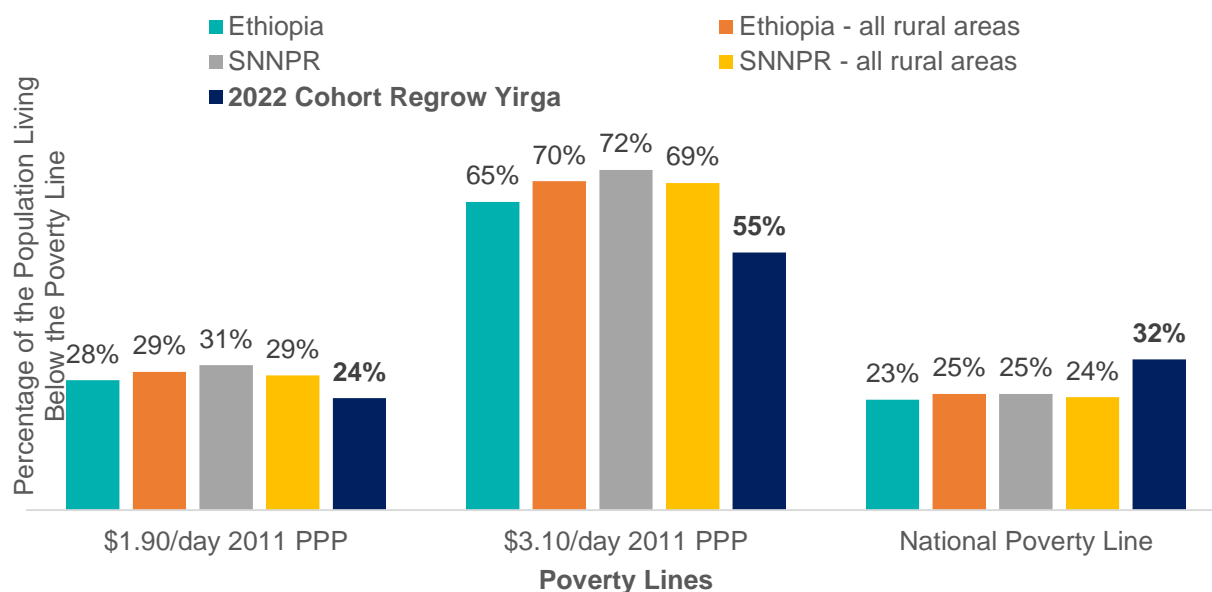
The PPI used to measure the poverty likelihood of farmers in this study is based on indicators related to the household size, education, household services (such as cooking fuel), and the ownership of durable assets (such as radio or mattress ownership). For a detailed description of the questions used to build the poverty profile of the coffee farmers and the adaptations required due to the limitations of the survey, please refer to the appendix.

The poverty rates obtained from our analysis of PPI scorecards are calculated by using the 2020 February version of the PPI, which is based on data from the Ethiopia Socioeconomic Survey 2015/16, a nationally representative survey. These are then compared with the poverty rate of coffee farmers in the program area by using PPP-based poverty lines as references, as well as various poverty lines. Figure 54 below shows the results of the poverty analysis. The PPI scorecard value for a region represents the percentage of a given population that lives below the poverty line.

The poverty analysis based on PPI shows that 23% of the sampled households are likely to fall below the \$1.90/day 2011 PPP poverty line, compared to 29% of rural households in SNNPR or 28% of rural households country-wide. However, when looking at the national poverty line the picture looks different, as 32% of the households fall below this indicator, whereas this is higher when looking at all rural areas in Ethiopia (25%) and across the country (23%).

¹⁵ For more information on the PPI, visit <https://www.povertyindex.org/about-ppi>.

Figure 54. Simple Poverty Scorecard based Poverty Rate



MULTI-DIMENSIONAL POVERTY INDEX

The global MPI is an international measure of poverty that complements traditional income-based poverty measures by capturing the deprivations that each person faces with respect to education, health, and living standards. It was developed and managed by the Oxford Poverty & Human Development Initiative and supported by UNDP. It is primarily used by UNDP (Human Development Report), World Bank, and other international institutions and covers over 100 countries.¹⁶

Understanding the multiple aspects of poverty such as lack of education, health deprivation, and poor standards of living is critical to assess the relative poverty of the participants. The MPI tool provides a multi-dimensional perspective of the relative poverty of farmers, where each respondent is classified as poor or non-poor depending on the weighted number of deprivations their household, and thus, they experience. Note that *incidence* refers to percentage of people that are multi-dimensionally poor/deprived, and *intensity* refers to proportion of indicators in which these poor people are deprived. The MPI has been evolving and updated over the years. The 2019 Global MPI is the latest published version of the tool and it employs data from the Ethiopia 2016 Demographic and Health Survey.¹⁷ Additional information on the dimensions of the MPI the adaptations required due to the limitations of the survey can be found in the appendix.

¹⁶ For more information, visit: <https://hdr.undp.org/en/2019-MPI>.

¹⁷ The main change is the use of a Household Dietary Diversity Index (HDDS) instead of using Body Mass Index (BMI) based on scores for calculating nutritional deprivation. Numerous studies using cross-sectional data for sub-Saharan African and South Asian countries show a direct link between dietary diversity and the nutritional adequacy of a diet (Hoddinott and Yohannes, 2002; Ogle, 2001; Bhargava, 2015; Hatloy et al., 1998). Also, Arimond and Ruel (2004) show that dietary diversity does predict height-for-weight z-scores (HAZ), weight-for-age (WAZ) z-scores, and undernutrition – the very measures used in the global MPI. While this MPI may not be completely comparable with the global one, the HDDS we employed provides similar information at much lower data collection cost, hence its use is justified.

This data has been compared with the MPI computed for the baseline coffee farmers. The results show that, on average, the sampled coffee households in the 2022 Cohort area were better off than the national and regional averages in 2011. Indeed, 74% of the households were considered multidimensionally poor., while this figure stood at 90% of the households in SNNPR, as shown in Figure 55 below. Moreover, the average poverty intensity for those that are considered to be multidimensionally poor is lower compared to regional and national averages.

Figure 55. Multidimensional Poverty - Incidence and Intensity

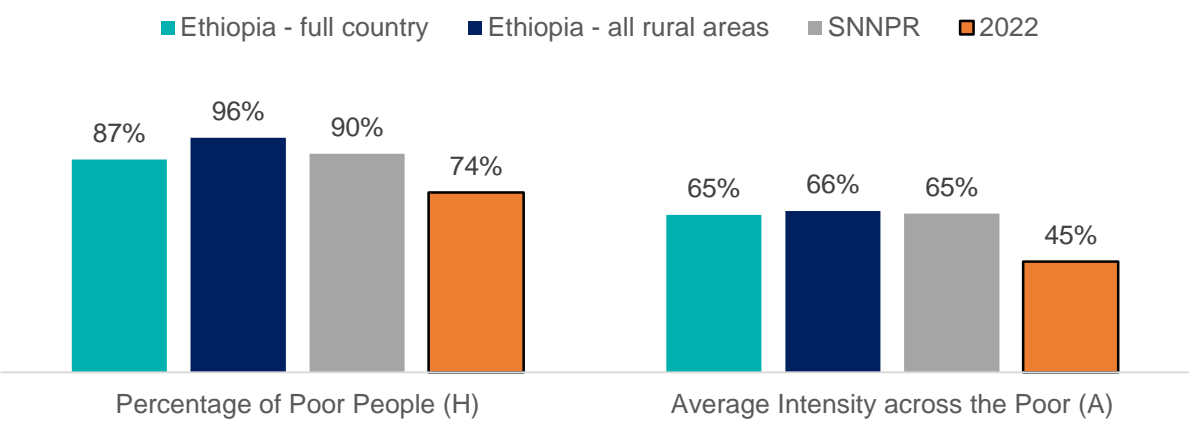
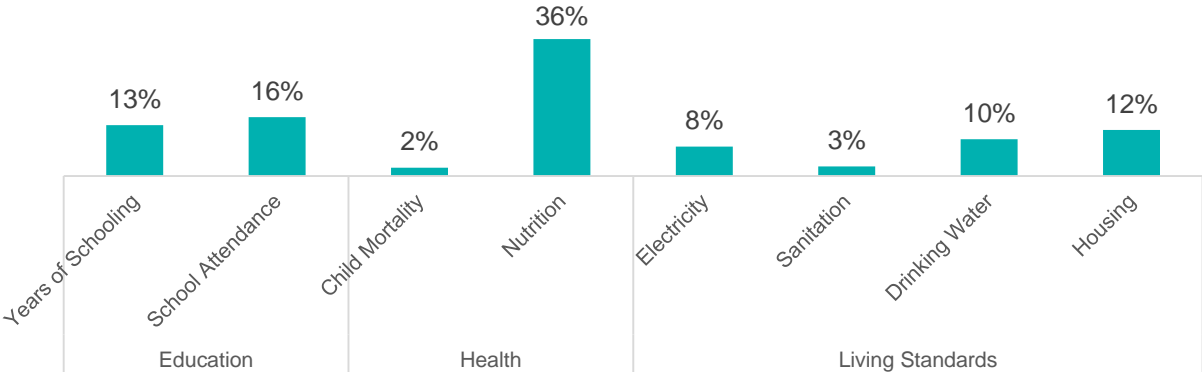


Figure 53 shows the contribution of the different indicators to overall poverty. The main contributor for the farmers in the program area is the nutrition component, with 36% of households having an HDDS score below or equal to 8, the threshold for deprivation in nutrition.

Figure 56. Contribution of each Indicator to Overall Poverty



WET MILL AUDITS

In addition to the Best Practice baseline survey, 4 of the 12 wet mills in the program area were sampled by woreda to be audited on the total volume of cherry and parchment purchased in the 2021/2022 harvest season. To collect the data, wet mill owners and, where unavailable, wet mill managers, were contacted by phone. The survey design was guided by the performance indicators for wet mills developed by USDA.

Table 4 below compares the total volume of cherry and parchment purchased by the mill for the season of 2021 / 2022 as obtained during the audit with data provided by TechnoServe. It can be observed that sales data obtained through the audit varies considerably from data provided by TechnoServe, with differences ranging between 4% and 302% for both cherry and parchment purchase. Note, the audit and TechnoServe data was not compared to the actual numbers in the wet mill records because the wet mills have only just established a client relationship with TechnoServe, and wet mills are generally closed outside of harvest season.

Table 4. Wet Mill Cherry Purchase and Total Parchment in KG, 2021/2022 Season

Woreda	Wet Mill	ID	Cherry Purchase 2021/2022 (kg)				Total Parchment (kg)			
			TechnoServe	Audit	Difference*		TechnoServe	Audit	Difference*	
Kochere	Asnakech Kebede	R1611	817,000	850,000	33,000	4%	138,000	111,500	26,500	19%
Yirgacheffe	Dumarso (426) and (23)	R865	250,222	297,000	46,778	19%	43,990	57,925	13,935	32%
D/Zuria	Makida Kedir aka Deki Deneba	R804	690,000	600,000	90,000	13%	116,520	111,240	5,280	5%
Gedeb	Wote Hambela / Mekuria Mergia	R1609	317,519	450,000	132,481	42%	59,220	238,500	179,280	302%

**Difference in % is calculated with TechnoServe data as base value.*

The large differences in the above data are likely attributed to the fact that phone surveys may not be the best way to collect this type of data, as mill owners/managers are unfamiliar with the Laterite enumerators that they are speaking with over the phone. This is shown in the lack of coherence between cherry and parchment data for the Asnakech Kebede and Wote Hambela / Mekuria Mergia wet mills. Where cherry and parchment figures

are not roughly in line with the 5:1 ratio (industry standard), the cherry amount is likely to be the more reliable figure of the two). Sales data collected on site in future audits will be presented as an addendum to the Regrow Yirga baseline report to be drafted in 2023.

CONCLUSION & RECOMMENDATIONS

Programmatic Recommendations

Income Diversity

76% of households in the cohort rely on coffee for half or more of their total income. In order to improve farmers' resilience to changes in coffee yield and prices, TechnoServe could explore encouraging alternative income sources that complement coffee farming. High dependency on coffee is also a barrier to the adoption of the stumping best practice, which renders stumped trees unproductive for one harvest season. Encouraging alternative income sources (perhaps via a dedicated training module) may therefore help to increase the adoption of stumping among participating farmers.

Household Gender Dynamics

The gender dynamics section of the survey shows that the male farmer often are responsible for decisions on major household expenditures and of money from coffee sales is spent. In order to promote more equitable decision making, TechnoServe could consider placing a greater focus on gender dynamics in the Coffee Farm College program. While gender is already a core focus of the program, a number of standalone training module on gender equality could be designed and delivered to provide training on gender roles, perceptions and decision making within the household.

SMS/Voice Messaging

Mobile phone ownership is high among households in the cohort, with around 70% owning at least one mobile phone. This presents an interesting opportunity to explore using automated SMS messaging throughout the program to remind farmers about training schedules and locations, as well as provide continuous information on best practices that are taught throughout the program. It is important to consider however that this would exclude many of the poorer farmers who do not have a mobile phone, and many female farmers in the cohort (less than 30% of which are literate). This second issue could be resolved by instead using voice messages where a farmer receives this information via an automated phone call rather than text message. Network connectivity, which is often poor in rural parts of Ethiopia, may also be a barrier, as well as the fact that many households do not keep their phones on or use them for text messaging.

Recommendations for Further Research

High Stumping Adoption

After the first training of the Coffee Farm College on pruning and rejuvenation, 27% of households had adopted the stumping best practice. This is a significant result given that many previous TechnoServe cohorts in Ethiopia would only expect to reach this adoption rate at endline, after two-years of training. We would therefore recommend exploring further, qualitative, research into why

farmers are adopting the stumping best practice so readily. This could include focus group discussions with participating farmers, as well as discussions with farmers in other, comparable regions of Ethiopia where TechnoServe also operates. Results of this study could eventually inform future program implementation such as the way stumping training and any potential incentives programs are delivered.

Household Gender Dynamics

In order to properly address the imbalance in household decision making described above, TechnoServe could consider qualitative research to further understand the gender dynamics within participating households. This research could help inform any perceptions farmers may have on household gender roles and what drives the decision-making process in the household, thereby informing gender-related program implementation decisions.

Methodological Recommendations

Measuring Compost Adoption

Composting, while not an individual best practice, is an important component of the nutrition best practice and a key part of the Coffee Farm College program. In order to pass the fertilizer component of the nutrition best practice, farmers must have self-reported to have used any fertilizer (most often compost or manure) in the last 12 months. This means that a key component of an important best practice is left up to farmer reported data. While observing compost/manure heaps on the farm is a part of the best practice survey, there is often a disconnect between this and the self-reported data that the best practice relies on. This difference could be due to a variety of reasons:

- The farmer may not currently have a compost heap, but made and applied compost in the previous 12 months.
- Unreliability of farmer reported data.
- The farmer may be unwilling/uninterested in showing their compost heap to the enumerator.
- The enumerator may not be properly probing into whether the farmer has a compost heap or not.

Due to this, it is difficult to ascertain the ‘true’ composting adoption among farmers with self-reported data and simple one-time observations at baseline and endline. We would therefore suggest the possibility of taking a more holistic approach towards monitoring composting adoption, by collecting data during farm visits (which all attending households receive at least twice a year). This would allow farmer trainers the opportunity to collect data on compost status at multiple time periods, taking pictures in order to verify the data. While this would be a large number of pictures to monitor (assuming visit data would be collected for all attending households), TechnoServe could explore using object recognition algorithms (such as Amazon Rekognition) to automatically identify whether a compost heap can be seen in a given photo. In order to train such an algorithm, TechnoServe could utilize the large number of images recorded during several years of best practice and farm support surveys in Ethiopia. This same method could also be extended to other best practices that are easily identifiable, such as record keeping. This method would not be particularly effective in cases where baseline farmers end up not participating in the program, as farmer trainers would only visit (and record the composting status) of participating farmers.

General Adoption Observation

As most best practice adoption variables rely on enumerator observation, this can leave some questions open to a certain amount of interpretation and subjectiveness. We would suggest testing using picture examples built into the survey in order to give the enumerator a reference point for each answer option. While enumerators are already shown examples in training, this would allow them to compare what they see in the field to what is shown on the tablet in order to make a more accurate (and potentially less subjective) observation. This could be applied to all (observable) best practices in order to improve adoption measurement as a whole.

APPENDICES

Appendix 1. USDA Indicator Table

Table 5. Baseline and target values for all program performance indicators with definitions

Indicator #	Performance Indicator	Definition	Baseline Value	Final Target
2	Volume of commodities sold by farms and firms receiving USDA assistance	<p>The volume of green coffee produced by wet mills receiving USDA assistance plus the volume of green coffee equivalent produced by trained farmers. For wet mills, annual sales records will be used to verify metric tons of green coffee produced. Where wet mill owners are unwilling to green sales information, parchment volume data will be converted to its estimated green equivalent volume. For trained farmers, self-reported data on coffee cherry sales will be used. The number of kilos of cherries harvested during the coffee season will be divided by 6.2 to arrive at the green coffee equivalent and subsequently divided by 1000 to convert kilos into metric tons.</p> <p>Green coffee produced by wet mills receiving USDA assistance²⁰: 1,959.</p> <p>Green coffee equivalent produced by trained farmers: 2,457²¹</p>	4,416 Mt green	30,505
3	Value of annual sales of farms and firms	The value of the total amount of sales of coffee by USDA-assisted farms and firms. For wet mills, the actual coffee sales value will be used. Where wet mill owners are unwilling to share price	\$37,968,768	132,276,142

²⁰ Calculated by multiplying the 2022 average of current wet mill clients (43.5 metric tonnes) by 45. 12 wet mill clients produced an estimated 522,512 kg of green coffee.

²¹ Calculated by dividing cherry and jenfel sales (with jenfel converted to cherry at a rate of 3:1) by 6.2 to reach green coffee equivalent, then by 1000 to reach metric tons. This is then extrapolated to the coffee program population target (37,500).

	receiving USDA assistance	<p>information, ECX or exporter prices will be used as best proxy. For trained farmers, self-reported data on coffee cherry sales volume multiplied by price will be used. Coffee cherry sales volume expressed in kilos of cherries harvested will be multiplied by farm gate price. For farm gate price, collection site average cherry buying price will be used (as most coffee cherries get sold to wet mills in the project area).</p> <p>At baseline, a price of \$8598 per metric ton is used, derived from price data shared by a coffee trader Mercon who bought at export (FoB) prices for grade 2 washed Yirga at \$3.5/lb. and grade 1 washed at \$4.2/lb. during May 2022 which translate roughly into an average price of \$3.9/lb. which is equivalent to \$8598 per metric ton (note that this is significantly above the historic average as the coffee prices shot up following frost in the coffee production area in Brazil last year)</p>		
4	No. of hectares under improved management practices or technologies with USDA assistance	The area of coffee farms where trained farmers adopt good agricultural practices: shade, weeding, record keeping, tree nutrition, erosion control, rejuvenation, Integrated Pest and Disease Management. A coffee farm is considered as under improved management when at least one of the above best practices has been newly adopted.	N/A	14,513
5	No. of hectares under improved mgmt. practices or technologies that promote improved climate	The area of coffee farms where trained farmers adopt good agricultural practices: shade, weeding, record keeping, tree nutrition, erosion control, rejuvenation, Integrated Pest and Disease Management. A coffee farm is	N/A	14,503

	risk reduction and/or natural resources management with USDA assistance	considered as under improved management when one of the above best practices has been newly adopted.		
6	No. of individuals in agriculture system applying improved management practices or technologies with USDA assistance	The total number of trained farmers who have applied at least one new good agricultural best practice. Trained farmers have attended at least half of the CFC training topics.	N/A	33,750

Table 6: Disaggregated baseline values for all program performance indicators

Ind. #	Performance Indicator (unit)	Client Type	Baseline Total	Disaggregated by gender		Disaggregation by age	
2	Volume of commodities sold by farms and firms receiving USDA assistance (MT)	Farmers	2,457	Male	12	15-29	273
				Female	115	30+	1,652
				Jointly owned	2,329	Mixed	533
		Cooperatives*	1,959	N/A		N/A	
3	Value of annual sales of farms and firms (USD)	Farmers	\$21,125,286	Male	\$105,626	15-29	\$2,344,907
				Female	\$992,888	30+	\$14,200,417
				Jointly owned	\$20,028,884	Mixed	\$4,579,962
		Cooperative*	\$16,843,482	N/A		N/A	
4	No. of hectares under improved management practices (Ha)	Farmers	N/A**	N/A**		N/A**	
5	No. of hectares under improved mgmt. practices or technologies that promote improved climate risk reduction (Ha)	Farmers	N/A**	N/A**		N/A**	
6	No. of individuals in agriculture system applying improved management practices (# farmers)	Farmers	N/A**	N/A**		N/A**	

* It is not possible to disaggregate cooperatives by age or gender.

** No hectares are currently under improved management.

Appendix 2. BP Adoption Rules & Pass Rates for Individual Adoption Criteria

Table 7: Adoption Rules and Pass Rates

Best Practice & Overall Pass %	Individual Adoption Criteria	Pass %
1. Business Skills and Record Keeping	Adopted if farmer has a record card;	0.2%
	and can show the record card to the enumerator;	0.2%
	and this has records of either coffee income, expenses such as hired labor or both.	0.2%
2. Weeding	Weeds twice or more per year;	98%
	and has no or few weeds under the canopy;	99%
	and weeds, if any, are less than 30cm tall;	99%
	and farmer has not dug under the canopy.	83%
3. Nutrition	Adopted if nearly all leaves are dark green and healthy;	85%
	and at least 1 of the recommended nutritional products was used on the coffee in the previous 12 months.	87%
4. Rejuvenation	Adopted if farmer had stumped in any of the last 3 years (before the start of training);	30%
	and before the training took place.	4%
5. IPDM	Adopted if farmer knows any 3 methods to reduce coffee berry disease (CBD) or white stem borer (WSB).	19%
6. Erosion Control	Adopted if at least 1 erosion control method seen.	60%
7. Shade	Adopted if there is 20% shade or more;	53%
	or shade trees have been planted in the last 2 - 3 years.	14%

Appendix 3. Household Composition and Adoption of Best Practices

This cohort of farmers contains households with various intra-household compositions. This includes certain farmers that are not living with a spouse. There are 40 “single farmers” in the baseline group, 35 of which are female (33 are managing the farm alone, while 2 are managing jointly with other family members). Comparisons are made between couple farmers and single female farmers and their adoption rate of best practices. Single male farmers are not included in this overview due to the small sample-size (n = 5). Within coupled farmers, comparisons are made between farms managed by the woman, the man, or both jointly.

Table XX below shows some notable differences in adoption rates between joint management, coupled male and female managers, and single female farmers for all best practices. Highest rates of adoption are equally distributed between coupled male, female, and joint managers, while single female farmers tend to have considerably lower adoption rates. The largest differences in adoption rates can be observed for shade, erosion control, and IPDM.

It is important to note that the small sample sizes for single farmers give this analysis little statistical power.

Table 8. Adoption Rates of Single and Couple Households

Household Composition Gender of Coffee Farm Manager	Couple			Single Female (n = 33)
	Woman (n = 40)	Man (n = 360)	Both (n = 312)	
1. Business Skills and Record Keeping	0%	0.2%	0.3%	0%
2. Weeding+++	71%	78%	85%	75%
3. Nutrition*	66%	77%	75%	66%
4. Rejuvenation*	7%	4%	5%	0%
5. IPDM* ++	27%	21%	17%	11%
6. Erosion Control** +	57%	58%	63%	43%
7. Shade*	64%	60%	61%	48%

The stars (*) represent the significance level of the difference between adoption rates of coupled households and single households (male and female single households): ** significant at the 5% level, * significant at the 10% level. The plus-signs (+) represent the significance level of the difference between adoption rates of jointly managed farms (either man and woman together; or jointly with other family members) and farms managed by one person (either male or female): +++ significant at 1% level, ++ significant at the 5% level, + significant at the 10% level.

Appendix 4. Characteristics of Adopting Households

A comparison of the characteristics of (i) households adopting three or more best practices – *High Adopters*, to those (ii) households who have implemented zero or one best practices – *Low Adopters*, reveals that the two groups are different. Differences are statistically significant for education, asset ownership, vulnerability to food shortages, income composition, as shown in Table 2. Other demographic characteristics, such as household size, the number of children, the ages, vulnerability to financial shocks, land size and composition, and household diet show no difference between the two groups.

In terms of education, higher formal achievements is observed in both female and male high adopters. The percent of women and men with formal education stands at 36% and 80%, respectively, for high adopters, whereas the same is equal to 24% and 69%, respectively, for low adopters. The differences are around 11% and are statistically significant at the 5% level for women, and at the 1% level for men. At the same time, high adopters are endowed with more assets than low adopters, and the difference is statistically difference at 1% level. In relation to shocks, food shortages appear to be less prevalent in high adopters than low adopters. Around 36% of the former are affected by food shortages, whereas almost 54% of the latter experience food shortages and the difference (18%) is statistically significant at the 1% level. Finally, high adopters are more dependent on coffee as a source of income by 5 percentage points compared to low adopters – a difference significant at the 1% level.

Table 9. Average Characteristics of Low and High Best Practice Adopting Households

Group	Low Adopters	High Adopters	Difference
No. of Households	N=218	N=538	High - Low
No. of Household Members	6.46	6.38	-0.08
No. of Children	3.81	3.73	-0.08
Age Female	37.1	37.5	0.40
Age Male	42.7	44.3	1.61
% of Women with Formal Education	24.4%	35.5%	11.1%**
% of Men with Formal Education	69.0%	80.0%	11.0%***
Land Ownership (in Ha)	0.98	1.07	0.09
Percentage of Land Planet with Coffee	65%	74%	9.15%
Asset Ownership	5.35	6.74	1.39***
% of HH that Faced Financial Shocks	51.2%	47.0%	-4.16%
% of HH that Faced Food Shortages	53.6%	36.0%	-18%***
Household Dietary Diversity Score	7.36	7.43	0.08
More than half of income coming from coffee	81.4%	86.1%	4.68%**

The stars (*) represent the significance level of the difference between the high- and low- adopting groups:

*** significant at the 1% level, ** significant at the 5% level.

Appendix 5. PPI and MPI Scorecards

Scores for the National Poverty Line, available at: <https://www.povertyindex.org/country/ethiopia>.

Table 10. PPI Scorecard

No.	Indicators	Responses	Score
1	In which region does the household live?	A. Amhara	0
		B. Oromiya	10
		C. SNNP	0
		D. Tigray	7
		E. Other regions	2
2	How many members are there in the household?	A. 1 to 4	20
		B. 5 to 7	12
		C. 8 or more	0
3	What is the highest grade that the household head completed? ²⁴	A. Kindergarten	0
		B. Nursery	0
		C. 0 grade	0
		D. From 1st to 4th grade	0
		E. Fifth grade or above	12
		F. Informal education (can read and write but has never been in regular school).	12
		G. Adult literacy program	12
		H. Satellite	12
		I. Non-regular (can read and write by attending a religious institution such as Kes or Kuran but has never been in regular school).	12
		J. Illiterate (not educated)	0
		K. Never attended school	0
4	Over the past one week (7 days), did you or others in your household consume any beef?	A. Yes	10
		B. No	0
5	Over the past one week (7 days), did you or others in your household consume any horse beans?	A. Yes	8
		B. No	0

²⁴ The survey does not identify a household head. Therefore, we took the highest educational level of either the woman/wife or man/husband.

6	The roof of the main dwelling is predominantly made of what material?	A. Thatch	0
		B. Mud and Wood	0
		C. Bamboo/Reed	0
		D. Plastic Canvas	0
		E. Corrugated Iron Sheets	7
		F. Concrete/Cement	7
		G. Asbestos	7
		H. Bricks	7
		I. Other	0
7	What type of toilet facility does the household use?	A. PIT Latrine without slab	0
		B. Composting toilet	0
		C. Field/Forest	0
		D. Flush toilet	6
		E. PIT Latrine (ventilated PIT)	6
		F. PIT Latrine with slab	6
		G. Bucket	6
		H. Other	0
8	What is the main source of light for the household?	A. Bio gas	0
		B. Electrical battery	0
		C. Light from dry cell with switch	0
		D. Kerosene light lamp (imported)	0
		E. Local kerosene lamp (Kuraz)	0
		F. Candle/Wax	0
		G. Firewood	0
		H. Electricity meter-private	9
		I. Electricity meter-shared	9
		J. Electricity from generator	9
		K. Solar energy	9
		L. Lantern	9
		M. Other	9
9	What is the main source of cooking fuel?	A. Collecting firewood	0
		B. Crop residue/leaves	0
		C. Dung/Manure	0
		D. Saw dust	0

		E. Solar energy	0
		F. Biogas	0
		G. Purchased firewood	10
		H. Charcoal	10
		I. Kerosene	10
		J. Butane-Gas	10
		K. Electricity	10
		M. None	0
		N. Other	0
10	How many axes (gejera) does your household own?	A. Zero	8
		B. One or more	0

Figure 42. MPI Functional Form

The functional form of the 2019 Global MPI can be obtained at:

https://hdr.undp.org/sites/default/files/hdr2019_technical_notes.pdf.

Table 11 . MPI Functional Form

Dimension	Indicator	Deprived if...	Weight
Health	Nutrition ²⁵	Any adult under age 70 or any child for whom nutritional information is available is undernourished. Adults over age 20 are considered undernourished if their body mass index is below 18.5 m/kg ² , individuals ages 15–19 are considered undernourished based on World Health Organization age-specific body mass index cutoffs and children are considered undernourished if the z-score of their height-for-age (stunting) or weight-for-age (underweight) is more than two standard deviations below the median of the reference population.	1/6
	Child mortality	Any child under age 18 has died in the five years preceding the survey. When a survey lacks	1/6

²⁵ The survey does not include anthropomorphic measurements that allow to determine nutritional deprivation as defined in the MPI. Therefore, we use the Household Dietary Diversity Score and assign a deprivation score if the household consumes less than eight types of foods.

		information about the date of child deaths, deaths that occurred at any time are taken into account. ²⁶	
Education	Years of schooling ²⁷	No household member age 10 or older has completed six years of schooling.	1/6
	School attendance ²⁸	Any school-age child ²⁹ is not attending school up to the age at which he or she would complete class 8.	1/6
Standard of living	Electricity	The household has no electricity.	1/18
	Sanitation	The household does not have access to improved sanitation (according to Sustainable Development Goal guidelines), or it is improved but shared with other households. A household is considered to have access to improved sanitation if it has some type of flush toilet or latrine or ventilated improved pit or composting toilet that is not shared. When a survey uses a different definition of adequate sanitation, the survey report is followed.	1/18
	Drinking water	The household does not have access to an improved source of drinking water (according to Sustainable Development Goal guidelines), or safe drinking water is at least a 30-minute walk from home, roundtrip. A household is considered to have access to an improved source of drinking water if the source is piped water, a public tap, a borehole or pump, a protected well, a protected spring or rainwater. When a survey uses a different definition of safe drinking water, the survey report is followed.	1/18
	Housing	At least one of the household's three dwelling elements—floor, walls or roof—is made of inadequate materials—that is, the floor is made of natural materials and/or the walls and/or the roof are made of natural or rudimentary materials. The floor is made of natural materials such as mud, clay, earth, sand or dung; the dwelling has no roof or walls; the roof or walls are constructed using natural materials	1/18

²⁶ Information about child deaths is typically reported by women ages 15–49. When information from an eligible woman was not available, information from a man was used when the man reported no death in the household, and information was coded as missing when the man reported a death (because the date of the death was unknown).

²⁷ The survey does not include detailed questions on educational achievements for household members other than the woman/wife or the man/husband. Therefore, only these two household members are considered to assess the deprivation of years of schooling.

²⁸ The survey does not have educational achievements for children. Therefore, we assume that children aged between 6 and 13 are correctly attending the grade associated with their range, and assess deprivation of school attendance based on this assumption.

²⁹ Official school entrance age is from UIS.Stat (<http://data.uis.unesco.org>).

		such as cane, palm, trunks, sod, mud, dirt, grass, reeds, thatch, bamboo or sticks or rudimentary materials such as carton, plastic or polythene sheeting, bamboo or stone with mud, loosely packed stones, uncovered adobe, raw or reused wood, plywood, cardboard, unburnt brick, or canvas or tent.	
	Cooking fuel	The household cooks with dung, wood, charcoal or coal.	1/18
	Assets	The household does not own a car or truck and does not own more than one of the following assets: radio, television, telephone, computer, animal cart, bicycle, motorbike or refrigerator.	1/18

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