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Abstract: We investigate food security in three villages in rural Ethiopia for smallholder farmers growing staple crops and coffee, and facing variable coffee and commercial input prices. The surveys were conducted in the coffee growing region of Oromia (Jimma Zone). Commercial input use among these smallholders remains sporadic, although most farmers use them occasionally. A major impediment to systematic usage is the price of these inputs. Policies lowering the unit cost and increasing the local availability of commercial inputs would be useful to systematically boost production and income generation. These smallholders rely on a major coffee cooperative to market their coffee. The cooperative helps with transportation and easing market participation decisions—it provides better prices and some market information. Many farmers rely on credit and banking services offered by the cooperative. The food insecure households are more likely to be led by a female head and to be constrained by extremely small land holdings than food-secure households. These food insecure households tend to work outside of their own farm more often than food-secure households, but in lower-return activities. In our sample, food shortages and household size do not seem to be related, although food shortages are less likely in households with more children. Despite the fast growing economy of Ethiopia, many of these households still face considerable impediments to improve their economic livelihoods and market participation because of bad roads, poor telecommunication infrastructure and limited land. Basic schooling seems to reach most of their children.

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Introduction

The objectives of investigation were to assess food security concerns in rural Ethiopia in the face of volatility of coffee prices and in the context of smallholders growing subsistence crops (corn, wheat, and teff) and coffee, and sometimes khat, for commercial purposes. The surveys were conducted in the coffee growing region of Oromia (Jimma Zone) in southwest Ethiopia in the villages of Bulbulo, Choche, and Kenteri. The project was a collaboration between the two authors at Iowa State University and two faculty members at Jimma University in Ethiopia, Dr. Berhanu Belay and Dr. Amsalu Nebiyu, who were assisted by their graduate students serving as enumerators, and a representative of the Oromia Coffee Farmers Cooperative Union (OCFCU). OCFCU is a major institutional arrangement supporting farmers marketing coffee. OCFCU also provide farmers with other functions (Meskela and Teshome 2014). Given the institutional support received by these smallholders via the OCFCU, it was interesting to investigate food security of smallholders in this context of the assistance provided by the coffee cooperative.

Food security in Ethiopia has been investigated before. In particular, we note Andersson et al. (2011) on food aid and safety nets, Barrett et al. (2001) on income diversification, Bellemare et al. (2013) on commodity price volatility, Beyene and Muche (2010) on the various causes of insecurity, Deressa (2013) on food security household size and literacy, El Ouaarmari and Cochet (2014) on crop mix and food security, Eneyew and Bekele (2012) on gender, weather shocks and land holding, Genreselassie et al. (2013) on small land holding and technology adoption, Jaleta et al. (2013) on access to input and credit and technology adoption, Maxwell et al. (2014) on food insecurity indicators, Mahammed (2014) on household size, land holding, and other characteristics in Jimma zone, Muleta and Deressa (2014) on female heads of households, education, and land holdings, Reardon (1997) on off-farm income and non-farm opportunities in

rural Africa including Ethiopia, and finally, World Food Program (2009) on livestock saving role in food security in Ethiopia.

Among all these studies, Mohammed (2014) is the closest to our analysis both in terms of the location of the investigation and the method followed in the investigation. Ethiopia has been experiencing fast economic growth, especially in urban areas, in the last decade—around 10% per year. In addition, the government of Ethiopia has undertaken significant infrastructure investments improving roads and telecommunications. Hence, it is useful to frequently revisit food security to see if this economic growth has benefited the rural poor and if infrastructure improvements have reached them.

The survey data phase of our project took place in Ethiopia in November 2014 and survey instrument design, interviews, and focus groups took place in late spring 2015. The questionnaire was geared to understanding challenges and opportunities involving the volatile coffee prices, value added creation and income generation on- and off-farm, agricultural production and input use, food situation, and household characteristics. We characterize food (in)security status by asking interviewees to self identify recent food shortages (see Maxwell et al. (2014) for different measures of food security). We also ask respondents to evaluate services of the coffee farmers' cooperative on coffee marketing, banking, market information, and other functions. The subsequent analysis investigates the complex interface of various factors and characteristics with the food security of these smallholder households who were interviewed. Five focus groups/village meetings were also held to discuss economic problems and challenges faced by villages. A total of 37 interviews were completed with coffee farmers, half of which were women farmers heading households. Many of these women are widows and did not become household head by choice.

There have been key lessons learned from the site visits and focus group interviews. In addition to the anticipated lessons on food security, we have learned about the existence of related needs and economic impediments caused by infrastructure shortcomings. One of the needs involves replacement of coffee trees, which are older stocks financed by an EU assistance project in the early 1990s. The farmers conveyed their concerns regarding the aging of tree stocks and the need to be replace them. However, the resource base of many farmers is insufficient to buy new trees, and the supply of trees is limited.

As these smallholders consider the long-term future, their primary concern is on the possibility of permanent reduction in their coffee harvest due to aging trees. Future projects beyond our pilot phase should address the replacement of coffee trees as an instrumental way to decrease income generation risk. The infrastructure impediments have to do with nearly inexistent modern communication means inhibiting phone banking and access to market information, and poor roads increasing the cost to market access and participation in markets.

Survey instrument

A survey instrument was designed at Iowa State University, then, during the first visit in November 2014 with Jimma University colleagues and enumerators, it was further refined prior to the collection of the first surveys. Questions were modified as needed and the enumerators translated the instrument into the Oromo language, which is spoken by 85–90% of the population in rural Jimma. Interviews were extensive and focused on the head of each household. Each respondent answered 34 sets of issues with sub-questions covering roughly 200 questions/answers per respondent. The questionnaire, in its English version, is provided in the appendix. Thirty-seven complete observations were gathered in three villages by four

enumerators and PI Teshome. The geographical dispersion and remoteness of villagers constrained the data gathering. Nevertheless, despite the limited number of completed surveys in this pilot phase, some interesting findings were identified.

Empirical analysis

Descriptive statistics of the sample

The average household size was 6.2 persons, slightly above the 4.8 average (Kuffa 2014) for the Oromia region. Rural households tend to be more numerous. Regarding other demographics, more than half (19 of 37) of the households were led by women, many of which, became "reluctant" heads for reasons outside their control (e.g., widowed). The average age was just above 50, and just 27% of household heads were literate. All children in these households are literate (a big step forward relative to heads of households). Finally we note that the dominant faith is Moslem, followed by Orthodox; the main ethnic group is Oromo generic of the ethnically-based Oromia region to which the Jimma zone belongs.

Regarding land holdings, the surveyed households are predominantly smallholders with average land holdings of less than two hectares devoted to crops and coffee trees. The range of land holding included a single outlier with 9 hectares and the smallest holding was 0.25 hectare. Roughly two-thirds of the land is devoted to crops; the rest is used for grazing and coffee growing. About 25% of households rent some of the land they use and some use sharecropping.

Looking at holdings of livestock and poultry, 35 households have animals (cattle, sheep, goats, and chickens). Thirteen households own a donkey, mule, or a horse. Twenty-nine households buy and sell some of these livestock or poultry on local markets. Feed comes from

communal grazing, household own-feed supply, and a few (3) households rely on the market to purchase feed.

With respect to input use, we found that most farmers (36 out of 37) buy fertilizer; 32 households buy commercial seeds and 21 households bought local seeds, and all households use their own seeds as well. Chemical inputs and vet drugs are also widely purchased (29 and 28 households, respectively).

However, few (8) households buy every year or systematically, except for the outlying household with the largest parcel among interviewees (9 hectares of land). So the potential expansion of the use of commercial inputs is mostly at the intensive margin rather than by eliciting new market participation by "new" farmers who have not done so in the past (the extensive margin). Little extensive margin is left to expand demand of commercial inputs. The reliance on purchase inputs varies by crop. Most households (35 out of 37) buy inputs for corn production and many households buy inputs for teff production (25 out of 37), few buy inputs for sorghum and vegetables. Twenty-three households have some seed storage system and most households treat their seed before storing. The main reason to buy on the market is when the household's own seed reserve is too small to meet the household needs, or if the past crop was short, leading to too few seeds for the next crop. Hence, most households do not seem convinced by the superior profitability of the systematic reliance on commercial inputs. Some households also mentioned that commercial seeds were scarce and pricey.

On income generation and diversification, in excess of 50% of households have one member working outside their own farm with various occupations (e.g., domestic workers in Gulf States, farm labor, market food vendor, driver for police, teacher). Regarding agricultural income, 14 households have a marketed surplus of corn, which is sold locally. Only three

households sold surplus teff. Regarding coffee production and sales 31 households sold coffee, representing most of their coffee crops. Coffee consumption by most households is limited. There is small additional income from production and sales of root and tubers, mangoes, pineapple, vegetables, avocadoes and Khat. Coffee is the major source of cash with median sales of 9 quintals or about 10,000 birrs. Khat is small (about 760 birrs for the average annual sale with one-third of households growing khat). Nobody in the sample reported consuming khat, probably because of the stigma attached to the consumption of a stimulant, which is legal in Ethiopia but frowned upon. Hence, income diversification is advanced and most of the 37 households participate in several markets. With respect to income utilization, households use their income to buy food from the market (27of 37), health services (33 of 37), schooling for children (36 of 37), inputs (36 of 37), and save for rainy days (30 of 37). Food purchases on markets mitigate food shortages at the household level.

Regarding the interface of farmers with their cooperative (OCFCU): for coffee production and marketing, most households said that the OCFCU has been helpful for transportation and handling of coffee to market (24 and 26 out of 37, respectively), by offering better prices than traditional traders (23 of 37), but less so by offering more stable prices or better payment schedules (12 and 15 out of 37, respectively). Regarding other services offered by OCFCU, 24 households use the banking and credit services set up by OCFCU. The credit is used to buy inputs, food, and to buy livestock. As we explain later in the statistical analysis, households that have experienced recent food shortages tend to more frequently rely on this credit to buy food. The OCFCU is also the major source of market news to market coffee (33 of 37 households) way ahead of radio and TV (22) and phone (6). Rural phone services in Ethiopia are limited and mobile banking and mobile market news are very limited to non-existent in rural

Ethiopia. Technical support for crops come from employees of the Ministry of agriculture of Ethiopia, and from OCFCU.

We found that 16 households experienced food shortage in recent years. These shortages were caused either by weather shocks compromising their agricultural production or market shocks with low prices for coffee and high prices for food production, especially for teff, which is consumed, but less often produced, in these villages. None of the households reported receiving any form of food aid or safety net.

Mean comparison between households with and without food shortage

Table 1 shows the mean of key characteristics of households when sorted into two groups (households with/without food shortages). Table 2 reports on the test of difference in means between the two groups for the same characteristics.

Table 1. Major Household Characteristics for Households with/without Food Shortage

Variables	Food shortage (yes=1, no=0)	N	Mean	Std. Deviation	Std. Error Mean
Literacy of head (0,1)	1	16	0.750	0.447	0.112
	0	21	0.710	0.463	0.101
Land holdings	1	16	1.070	0.704	0.176
	0	21	2.240	2.046	0.446
Off own farm work	1	16	0.630	0.500	0.125
	0	21	0.480	0.512	0.112
Household size	1	16	5.690	2.089	0.522
	0	21	6.520	2.015	0.440
Female head of household	1	16	0.750	0.447	0.112
	0	21	0.330	0.483	0.105
Household adult number	1	16	4.440	2.366	0.591
	0	21	4.430	2.420	0.528
Number of children	1	16	1.250	0.775	0.194
	0	21	2.095	1.513	0.330
Coffee production	1	16	8.875	6.120	1.530
	0	21	14.735	21.389	4.667
Corn production	1	16	9.906	7.656	1.914

	0	21	16.535	28.067	6.125
Land/labor ratio	1	16	0.200	0.123	0.031
	0	21	0.357	0.334	0.073
Bank and credit use of Coop (0,1)	1	16	0.812	0.403	0.101
	0	21	0.476	0.512	0.112
Livestock heads	1	16	4.000	3.347	0.837
	0	21	4.952	4.738	1.034
Cattle heads	1	16	2.125	2.778	0.694
	0	21	3.619	3.653	0.797
Age of household head	1	16	47.375	10.230	2.557
	0	21	52.286	12.566	2.742
Corn marketed surplus	1	16	2.156	3.932	0.983
	0	21	7.244	23.313	5.087
All grain marketed surplus	1	16	2.406	3.878	0.970
	0	21	8.339	24.642	5.377
Total agricultural surplus (coffee, grains)	1	16	11.281	8.153	2.038
	0	21	23.074	45.012	9.822
Number of household members working outside	1	16	0.688	0.602	0.151
	0	21	0.571	0.676	0.148
Net farm labor in household	1	16	5.000	2.191	0.548
	0	21	5.952	2.156	0.470

Table 2. Test of Equal Means (households with and without food shortages)

Variables being tested for equality of means		t-test for Equality of Means			
		t	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Literacy of head (0,1)	Equal variances assumed	-.236	.815	-.036	.151
	Equal variances not assumed	-.237	.814	-.036	.151
Land holdings	Equal variances assumed	2.181	.036	1.168	.535
	Equal variances not assumed	2.434	.022	1.168	.480
outside own farm work	Equal variances assumed	-.885	.382	-.149	.168
	Equal variances not assumed	-.888	.381	-.149	.168
Household size	Equal variances assumed	1.231	.226	.836	.679
	Equal variances not assumed	1.225	.230	.836	.683
Female head of household	Equal variances assumed	-2.683	.011	-.417	.155
	Equal variances not assumed	-2.712	.010	-.417	.154
Household adult number	Equal variances assumed	-.011	.991	-.009	.795
	Equal variances not assumed	-.011	.991	-.009	.793
Number of children	Equal variances assumed	2.035	.049	.845	.415
	Equal variances not assumed	2.208	.035	.845	.383
Coffee production	Equal variances assumed	1.060	.296	5.860	5.528
	Equal variances not assumed	1.193	.244	5.860	4.912
Corn production	Equal variances assumed	.916	.366	6.629	7.234
	Equal variances not assumed	1.033	.312	6.629	6.417
Land/labor ratio	Equal variances assumed	1.786	.083	.157	.088
	Equal variances not assumed	1.986	.057	.157	.079
Bank and credit use of Coop (0,1)	Equal variances assumed	-2.164	.037	-.336	.155
	Equal variances not assumed	-2.236	.032	-.336	.150
Livestock heads	Equal variances assumed	.684	.499	.952	1.393
	Equal variances not assumed	.716	.479	.952	1.330
Cattle heads	Equal variances assumed	1.362	.182	1.494	1.097
	Equal variances not assumed	1.413	.166	1.494	1.057
Age of household head	Equal variances assumed	1.273	.211	4.911	3.857
	Equal variances not assumed	1.310	.199	4.911	3.750
Corn marketed surplus	Equal variances assumed	.861	.395	5.088	5.910
	Equal variances not assumed	.982	.337	5.088	5.181
All grain marketed surplus	Equal variances assumed	.951	.348	5.933	6.239
	Equal variances not assumed	1.086	.290	5.933	5.464
Total agricultural surplus (coffee, grains)	Equal variances assumed	1.032	.309	11.793	11.429
	Equal variances not assumed	1.176	.252	11.793	10.031
Number of members working outside the farm	Equal variances assumed	-.542	.591	-.116	.214
	Equal variances not assumed	-.551	.585	-.116	.211
Net farm labor in household	Equal variances assumed	1.322	.195	.952	.720
	Equal variances not assumed	1.319	.196	.952	.722

We find that the two groups differ in the following mean characteristics: food insecure households have smaller land holdings, are more likely to be led by a female head, have fewer children, a smaller land/labor ratio, and are more likely to rely on the OCFCU for access to credit and banking than food-secure households. The two groups do not differ in means characteristics when looking at literacy of the household head, household size, number of adults in the households, occurrence of work outside of the households, cattle and livestock holding, and various measures of agricultural output and marketed surplus for crops. We also note that the variances of most characteristics for the food secure group are larger than for the group experiencing food shortages. This can be explained by the presence of a large outlier in the food-secure group with 9 hectares and associated large output and other large holdings. These larger variances increase the standard deviation of the difference of the means of the two groups and lower the magnitude of the t statistics like in the case of the difference of mean coffee production and corn production of the two groups.

Logit analysis

Next, we analyze the occurrence of recent food shortages experienced by these households and link these occurrences (shortage/no shortage) to household characteristics. The analysis is limited because of the number of observations and because of the lack of variation in some of the household decisions and characteristics such as their reliance on markets to purchase inputs and purchase and sell food on local markets. Sporadic market participation appears to be common to most households and does not exhibit variation that can be used statistically to explain occurrences of food shortages. Similarly, we do not have variation of prices across households and the variations in income from agricultural activities come from variations in agricultural

output, which we exploit in our statistical analysis. Characteristics that could explain the occurrence of shortage, and which exhibit enough variation within our small sample, include land holding, livestock holdings, staple food and coffee productions, household size and composition (adults, children, older dependent), gender and age of the household head, off-farm labor participation, and literacy of the household head. Compounding these limitations is the potential issue of endogeneity of some of these potential determinants (bank and credit use with coop, work outside of their own farm) with the occurrence of food shortages, potentially to mitigate the impact of the shortage, like reliance on credit and/or off-farm labor decisions.

We run logit models with various specifications explaining the occurrence of shortages (yes, no, or 1,0). In Table 3 we present a parsimonious specification, which does well at predicting odds (0,1) of shortage, and which does not suffer from endogeneity problems or multicolinearity issues such as variance inflation for estimated parameters. Table 4 presents the percentage of correct predictions for the two specifications reported in Table 3.

Table 3. Variables in the Logit Shortage Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Female head	1.469	.694	4.485	1	.034	4.347
Land holdings	-.872	.420	4.301	1	.038	.418
Number of children	-.456	.324	1.977	1	.160	.634
Work outside own farm	1.390	.804	2.989	1	.084	4.015

Table 4. Classification Table for Specification Shown in Table 1				
Observed		Predicted		
		Food shortage		Percentage
		0	1	Correct
Food shortage	0	17	4	81.0
	1	5	11	68.8
Overall Percentage				75.7

First, we find that households led by a female head are much more likely to experience occurrences of food shortage. This is consistent with findings in the literature (Eneyew and Bekele 2012; Genreselassie et al. 2013; Muleta and Deressa 2014).

The literature also recognizes the importance of land holdings to generate agricultural output and generate income (Eneyew and Bekele 2013; Gebreselassie 2006; Mohammed 2014; Muleta and Deressa 2014). Land is a proxy for income generation potential and a measure of its resource endowment. We find a strong positive link between land holding size of households and food security. This is robust results in level or in log transformation (not reported) and does not change with variation in specification with the inclusion or deletion of other variables.

Similar thinking links livestock holdings and food security in the food security literature (Andersson et al. 2013; World Food Program 2009). However, in our sample, we do not find any link between livestock holding size or cattle holding size (number of heads) and the occurrence of food shortages. This was not surprising since the mean tests suggested that the means difference for these two variables was not statistically different from zero. Similarly, when we use more direct measures of coffee and/or corn production or marketed surpluses of households, we do not find any influence of these proxies for agricultural income on the occurrence of food shortages. Again, the means tests were consistent with this result, showing no statistically significant difference between the two groups.

Even though we did not find a statistically significant difference in off-farm activity behavior in the test of means between the two groups, we find that labor participation outside the own farm increases the odds of food shortages. This is surprising and contrary to many findings in the literature on food security (Barrett et al. 2001; Reardon 1997). This result can be interpreted as an additional element of small resource endowments of households paralleling small land holdings—perhaps equipment limitations or means of transportation limitations. Households with limited resources have a higher propensity to work off-farm because their resource base is constrained and faces higher probability of production shortfall. The usual interpretation is that non-agricultural income reinforces food security rather than the opposite. Here we see off-farm labor participation as a signal of small agricultural endowment rather than a larger total income generated by off-farm opportunities. We tested for endogeneity of the off-farm labor participation variable using an instrumental variable approach and could not find a significant relationship between the occurrence of food shortage and the estimated residuals from the instrumental variable regression predicting off-farm labor participation. The literature has noted that income inequality perpetuates in work opportunities outside the own household, with poor households being often confined to lower value-added occupations (farm labor, food market vendor, domestic work in Arab countries). We note in our dataset that households with food shortages are more likely to work as farm laborer, or as domestics in Arab countries and that better off households work as drivers or other more remunerative jobs.

Regarding demographics (number of children, number of adults, and household size), we find the following results: the literature associates larger households with higher probability of food shortage and/or food insecurity (Mohammed 2014; Muleta and Deressa 2014). However, we find no conclusive link between household size and food shortage and no significant link

between the number of adults and shortages. We do find a significant and negative relationship between the number of children and the likelihood of food shortage, which is a surprising result. This result is robust to specification changes when we change the set of explanatory variables. A possible way to rationalize this result is that children provide some labor force and might increase the net income generation for the household and be a net gain to the household rather than a net drag on its consumption per person because of higher expenses.

The literature on food security tends to find a positive link between food security and education, greater age, and experience of farmers (e.g., Deressa 2013; Muleta and Deressa 2014; Barrett et al. 2001). In our regressions, we did not find a link between the education level of the head of the household, her/his age, or her/his experience and the incidence of food shortages. The small sample we used may be the cause of this lack of finding. The inclusion of any or both these variables does not add explanatory power or improve prediction of the occurrence of food shortages. The previous tests of means on these variables suggested no statistically significant differences between the two subgroups of households.

Conclusions

Commercial input use among the smallholders we surveyed is not novel but remains sporadic over time. The potential for expanding these input markets does not reside in finding new buyers/users. Most smallholders are already familiar and have been using markets for these inputs, but they participate in these markets in a limited fashion. Time-to-time they rely on high(er) quality seeds and fertilizer, but only when their own seeds are not available or if prices are relatively more favorable. A major impediment to a more systematic usage is the price of these higher quality inputs. Farmers seem to know that these inputs lead to higher output but

must evaluate that the net benefits of such inputs vary depending on their price and availability. Traditional seeds (own saved by farmers at harvest) and fertilizer are the most common source, and most farmers report fairly advanced seed conservation practices. Policies lowering the unit cost and increasing the local availability of commercial inputs would be useful to systematically boost production and income generation.

Regarding the major coffee cooperative, the reliance of these smallholders on the coffee cooperative to market their coffee is almost generalized. They credit the cooperative for helping with transportation and easing market participation decisions, and for providing good prices and some market information. Many farmers rely on credit and banking services offered by the cooperative as well.

On food security, we saw that the households having experienced food shortages are more likely to be led by a female head and constrained by small land holdings than food-secure households. These households experiencing food shortages tend to work outside of their own farm more often than food-secure households, but more often in lower-return activity such as farm labor, working abroad as servant in Arab countries, or selling food items at the market. The wealthier households work as drivers with police offices and more often in non-farm activities. We could not establish the causal link between food shortages and labor participation outside the own farm. We also found that food shortages and household size do not seem to be related, although we found that food shortages are less likely in households with more children.

Further we did not find a link between livestock holding and the occurrence of food shortage nor did we find a link between food shortages and the size and combination of agricultural output by each household (corn and coffee production or marketed surplus). Khat is

a limited source of income diversification for a few households, and even for these households coffee production is a larger source of income.

In the context of the fast growing economy of Ethiopia, many of these rural households in the three villages we surveyed are still facing considerable impediments to improve their economic livelihoods and market participation due to bad roads, poor telecommunication infrastructure, and limited land. The remarkable national economic growth has eluded them. On a more positive note, basic schooling seems to reach most, if not all, children.

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Appendix (Available upon request)

Questionnaire survey instrument (in English)

I. General Information about your household demographics

1. 1 PA _____ _____ 1.2 code No. of HH _____
1.3 Ethnicity ____ 1.4. Religion _____
2. What are the age, education level and the gender of the head of the household?
   a. Age:
   b. Gender:
   c. Writing and reading skills (Can write and read): Yes No
   d. Schooling (Circle) No schooling below 4th grade
   above 6^{th} grade above 8^{th} grade
3. Family size living in the house by age and gender

a. Males < 15 yrs _____
b. Males ≥15 _____
c. Females < 15yrs _____
d. Females ≥15_____
e. Total _____

4. Does the household educate (send to school) the children? Yes No

If yes: a. Child 1
   b. Child 2
   c. Child 3
   d. More….

e. If no; why----------

5. Do you have other dependents in the household? No, Yes

If yes, who are these dependent household members?

   a. Elderly parents
   b. Relatives of the household
   c. Others, Specify----------

6. Does anyone in this household work outside the household farm?
   a. Yes b. No
   If yes, how many of the family members work outside their farm ----------
   If yes, what do people do?

6.1. Person 1 ----------Activity a. farm labor b. Nonfarm
   c. Type of specific activity---------- d. Peak season for off-farm activity

6.2. Person 2 ----------Activity a. Farm labor b. Nonfarm
   d. Type of specific activity ----------d. Peak season for off farm activity

6.3.More people…..

II. General information about farm operation production

7. Total size your farming operation (ha)----------

Land Use:

a. Crop land b. Grazing land c. Forests d. Other (specify)

8. Do you farm other lands (rented, share cropping, other arrangements)?

a. No

b. Yes How much--------- and arrangement (rent, share-cropped, other) _____ _____

9. Total number of animal/livestock species owned by the household

a. Cattle _____ b. Sheep _____ c. Goats _____
d. Chickens _____ _____e. Donkeys _____ f. Mules_____
10. How long have you operated your farm? (Years)_____
11. What crop farm activities are parts of your farming operation a recall data from last year? *(Check all that apply.)*

Crop	Yes	No	Quantity	Amt. consumed within	Amt. sold
Maize					
Teff					
Oilseeds					
Pulse					
Coffee					
Khat					
Root and tubers					
Vegetables/horticulture					
Others, specify					

12. What farm activities are parts of your livestock farming operation (a recall data from last year)? *(Check all that apply.)*

Activities	Yes	No	Quantity (units)	Amt. sold	Amt. consumed within
Cattle					
Sheep					
Goats					
Poultry					
Others (specify)					

13. Which of these input sources do you use on your farm?

	No	Yes	Source if yes
a. Purchased inorganic fertilizers			
b. Purchased improved seeds			
c. Local seed (landrace)			
d. Purchased chemicals (herbicide and pesticide)			
e. Homemade organic fertilizer			
f. Veterinary drugs			
g. Artificial Insemination services			
h. Others (specify)			

14. If yes on any of 14, please indicate which commodity you may buy inputs for:
a. Corn b. Teff c. Sorghum
d. Vegetables e. Others
15. When you use your own seeds,
a. how do you store them?_____
b. do you treat them? _____
16. Did you buy your farm animals? a. Yes b. No
17. If your answer for question 17 is yes, what are the sources for your activity for each species?

a. Poultry	yes	if yes, source

b. Goats yes if yes, source
c. Sheep yes if yes, source
d. Bee colony yes if yes, source
e. Cattle yes if yes, source

18. Where do you get your supply for animal feed?

a. On farm b. Communal grazing areas c. Purchase from local market
d. Other

19. Are there other income-generating activities either for household use or marketed to others?

a. Wood products b. Charcoal, c. Handcraft, d. Petty trading, e. Other

III. Income and marketing activities

20. Were you selling coffee before you became a member of the OCFCU?

No Yes, if **yes**, to whom/how

21. How long have you been a member of the OCFCU? (Years)
22. How instrumental has the OCFCU has been in terms of marketing coffee for

a. Physical access to markets & handling (moving the coffee)

Transport No Yes (how exactly) describe

Handling No Yes (if yes bags, cleaning, quality control) describe

b. For pricing

Higher prices? No Yes If yes by how much (in burrs)

More stable prices (than before) No yes If yes range reduction (in burrs)

Payment schedules No yes If yes how (less delay, less default)

23. Do you market other crops? If yes how/where

a. Crop 1
b. Crop 2
c. Crop 3

24. Do you have other sources of cash income other than the marketed crops listed in question 10?

Yes **N**o

If **yes**, a. Transportation service
b. Farm labor outside the HH farm
c. Food processing
d. Other (describe)

25. How does your household use the cash income from coffee and other major cash crops?

a. Buy food
b. Agricultural inputs such as Fertilizer Quality seeds Chemicals
c. Schooling
d. Health expenses
e. Savings for the future
f. Other_____

26. Do you use the banking and credit offered by OCFCU? **Yes** **No**

If No, why_____
If Yes, what do you use the credit for?

a. To buy food
b. Input for agriculture (e.g., fertilizer etc...)
c. Other household needs (e.g., school, healthy/hospital etc...)

d. Other_____

27. Where do you get the price information?

a. Local cooperative office

b. Information on cell phone

c. Other sources (which)

28. Where do you get technical advice on farming practices?

a. Ministry of Agriculture workers b. OCFCU c. Other

IV. Household food security (Thinking of the last five years)

29. Has your household faced any food shortage?

1. No 2. Yes

If yes describe occurrence (year and cause, food items) and how severe/acute

Year causes food items in short supply

a. Occurrence 1

b. Occurrence 2

c. Occurrence 3

More

30. Where do you get your food supply? (household production, other households, market, food aid)

a. Household production

b. From other households

c. From the market

d. Food aid (food for work, other)

e. All of the above

f. Other

31. What are the sources for the following food items?

	Household production	Markets	Food aid
Maize			
Teff			
Vegetables/horticulture			
Root and tubers			
Meat			
Milk			
Poultry			
Egg			
Other			

32. What is the biggest threat to your household food security?

a. Weather conditions
b. Food prices
c. Cash crop price volatility
d. Land constraint
e. Labor constraint
f. Lack of Non/Off farm labor income opportunities
g. Input price
h. Land productivity

33. In the last five years, how is the trend of food security status at the household level

a. Increasing b. Decreasing c. Stable

34. Is there anything that you would like to add?