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ETHIOPIA STRENGTHENING LAND TENURE AND ADMINISTRATION PROGRAM ENDLINE REPORT

An Impact Evaluation of the Effects of Second-Level Land
Certification Relative to First-Level Certification

This publication was produced at the request of the United States Agency for International Development. It was prepared independently by The Cloudburst Group.

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This impact evaluation report and endline analysis is the collaborative efforts of several individuals, particularly: Adi Greif and Dan Mattingly (technical leads on the econometric analysis), Lauren Persha (overall research lead for the endline analysis and final report drafting), Stephanie Fenner (data management, coding, and analysis support), and Karol Boudreaux, Aidan Boyd, Cynthia Caron, and Heather Huntington (research support and report inputs).

Prepared for the United States Agency for International Development, USAID Contract Number AID-OAA-TO-13-00019, Evaluation, Research and Communication (ERC) Task Order under Strengthening Tenure and Resource Rights (STARR) IQC No. AID-OAA-I-12-00030.

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Ethiopia Strengthening Land Tenure and Administration Program Endline Report

An Impact Evaluation of the Effects of Second-Level Land Certification Relative to First-Level Certification

MAY 2016

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The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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ACRONYMS

ATT	Average Treatment Effect on the Treated
DFID	Department for International Development
DID	Difference-In-Difference
EEA	Ethiopian Economics Association
ELAP	Ethiopia Land Administration Program
ELTAP	Ethiopia Strengthening Land Tenure and Administration Program
ERC	Evaluation, Research and Communication
FDR	False Discovery Rate
FHH	Female-headed Household
GIS	Geographic Information System
GoE	Government of Ethiopia
GPS	Global Positioning System
ha	Hectare
ICC	Intra-cluster Correlation Coefficient
IE	Impact Evaluation
LIFT	Land Investment for Transformation
LOESS	Local Regression
LTPR	Land Tenure and Property Rights
MDES	Minimum Detectable Effect Size
MHH	Male-headed Households
REILA	Responsible and Innovative Land Administration
SIDA	Swedish International Development Agency
SNNP	Southern Nations, Nationalities, and Peoples' Region
SOW	Statement of Work
SWC	Soil and Water Conservation
USAID	United States Agency for International Development

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EXECUTIVE SUMMARY

Following decades of social, political and economic insecurity marked by conflict, famine, regime change, and land redistribution, in the late 1990's the Government of Ethiopia (GoE) embarked on an ambitious program to document and register lands held by rural households. This “first-level” land certification program was designed to increase tenure security and certify long-term use rights for rural households. The program has been widely viewed by donor institutions, development practitioners and scholars as one of the most successful low-cost land registration programs in Africa or anywhere else in the world.

Despite the well-documented benefits, first-level certification was also perceived to have key limitations that rendered it unlikely to be a viable long-term solution for securing land rights for smallholders. In particular, the process did not map individual plots or provide a sufficient level of spatial detail around boundary documentation to allow for the development of cadastral maps for improved land use management and administration. Moreover, the lack of computerized land registries under first-level certification did not enable effective management and updating of registration records.

With a view towards addressing these limitations, beginning in 2005, the USAID-supported Ethiopia Strengthening Land Tenure and Administration Program (ELTAP) worked with *woreda*-level (district) land administration agencies to pilot a second-level land certification process. ELTAP was implemented in Tigray, Amhara, Oromia and Southern Nations, Nationalities, and Peoples' Region (SNNP) from 2005 to 2008. USAID support for second-level certification continued under the Ethiopia Land Administration Program (ELAP), which ran from August 2008 to February 2013.

This report presents the results of an impact evaluation of the ELTAP/ELAP second-level certification work. The evaluation focuses on the impact of second-level certification relative to first-level certification impacts across a range of household-level outcomes. As such, the results provide insights on the role of land rights clarification and enhanced documentation in meeting broader development objectives. The study contributes original evidence on the role of land tenure strengthening in mitigating development challenges and helps build the knowledge base about the longer-term components of a functional land registration process.

The overarching question that underlies and motivates this evaluation is:

“Does second-level land certification marginally increase tenure security and improve rural livelihoods as compared to first-level land certification?”

The evaluation focuses on four broad questions listed below.

- Q-I. What are the marginal welfare and tenure security benefits to households from second-level certification, relative to first-level certification?
- Q-II. How, if at all, have second-level land certificates been used as proof of ownership, and is their use different from that of first-level land certificates?
- Q-III. How do beneficiaries, including landholders and local government officials, perceive the value of first- and second-level certifications?
- Q-IV. How has second-level certification affected intra-household welfare differently from first-level land certification?

The evaluation estimates the Average Treatment Effects on the Treated (ATT) for households that received second-level certification over first-level certification, using a quasi-experimental Difference-in-Difference (DID) approach coupled with entropy balancing. The study estimates impacts on household beneficiaries, for a set of outcomes across six outcome families:

- Access to credit;
- Land disputes;
- Land rental activity;
- Soil and water conservation investments;
- Land tenure security; and
- Female empowerment and decision-making over land.

Impacts of second-level certification are estimated from a panel data set of 4,319 households that were surveyed across 284 *kebeles* (village clusters) in Amhara, Oromia, SNNP, and Tigray regions, at the start of the second-level certification process and again some 3-7 years afterwards.

In addition to average impacts, the study also examines how impacts of second-level certification vary for a set of seven program-relevant characteristics of households or villages that could be important modifiers of program effect: gender of household head; marital status of household head; program round (i.e., ELTAP vs. ELAP); household total landholdings; wealth status; age of household head; and distance to regional capital. The results provide additional guidance to inform policy and programming considerations.

KEY FINDINGS

The evaluation results suggest positive and significant impacts, on average, of second-level certification relative to first-level certification, for indicators from three outcome families (Table 1).

- Credit access: The study finds a 10% additional increase in the likelihood of households in the treatment group taking out any credit for farming purposes, and a small increase in the average amount of credit obtained. The results indicate a small average magnitude of impact, and are robust to different model specifications. This result is encouraging, but should be viewed with caution since land certificates cannot be used as collateral in formal lending situations in Ethiopia, and the mechanism for this impact is not clear from the study data. This result may relate more strongly to household credit activity obtained through an informal lending environment.
- Tenure security: The study finds moderate impacts on certain indicators for land tenure security, including an 11% increase in the likelihood of the household believing they have a heritable right to bequeath their land, relative to households with no certification or first-level certification.
- Female empowerment and involvement in land-related decision-making: The analysis indicates an 11% increase in the likelihood of a wife possessing land in her name, and a 0.32 hectare increase in land held jointly by husband and wife or by female-headed households, as a result of second-level certification. The evaluation also finds a 44% increase in a wife deciding which crops to grow on land in her possession. The magnitude of these impacts are fairly large, and results are moderately robust.

FULL VERSUS PARTIAL SECOND-LEVEL CERTIFICATION

The evaluation dataset encompassed households that received full second-level certification, as well as a large group of households with partial second-level certification (53% of households which received second-level certification during the evaluation period received this partial treatment, in the evaluation dataset). Partial certification occurred when a household's land was surveyed via a participatory process but formal documentation was not provided. This discrepancy in treatment application stems from the program inability to issue the second-level certificates, as this is the formal responsibility of the Government. This treatment disparity made it possible to examine the potential differences in impacts for full vs. partial second-level certification and enables the study to advance the knowledge base on the relative contributions of participatory land surveying and formal documentation to development outcomes of interest. Overall, the analysis points to few substantive differences in impacts across households that received partial versus full second-level certification, although the results do show some evidence of differential treatment effects.¹

TABLE I. OVERVIEW OF SIGNIFICANT AVERAGE TREATMENT EFFECT RESULTS

		Treatment A	Treatment B	Treatment C	Treatment D
		Full or partial 2nd level certification	Full 2nd level (survey & certificate only)	Partial 2nd level (survey only)	Full or Partial 2nd vs no or 1st level
Outcome Family Label					
Access to credit	Amount of credit taken for farming purposes in past year in Birr	+		+	+
	Household took any credit for farming purposes in past year (Yes/No)	+		+	+
	HH formally or informally used land as collateral to obtain credit	-		-	-
Land tenure security					
Female empowerment & decision-making over land	HH believes it has heritable right to bequeath land (Yes/No)				+
	Wife possesses land in her name (Yes/No)				+
	Wife has certificate of title for land in her possession	-	-		
	Wife decides what crops to grow on land in her possession	+	+		
Area of land in hectares possessed by wife only, or husband and wife jointly			+		

Reported results are based on impact estimates obtained via an entropy-weighted fixed effects difference-in-difference model.

Increasing statistical significance is indicated by large and bolder font.

Significance reported as: +/- : $\alpha < 0.10$; +/- : $\alpha < 0.05$; and **+/-** : $\alpha < 0.01$

¹ While the evaluation results suggest few material differences in impacts across these two sets of households, the study does not conclude from the analyses that surveying alone is sufficient to generate positive tenure security or household economic impacts. Given that such households anticipated receiving the full second-level process and formal documentation, it is not possible to know whether their impacts as measured reflect land and related decisions and beliefs made on the actual level of treatment received, or whether such decisions and beliefs also incorporate the household's legitimate expectation to eventually receive formal documentation of their land rights. It is possible that over time, if these households continue to operate in this legally ambiguous area between first- and second-level certification, their behaviors will change and their perception of tenure security will erode. Such a shift may emerge only over longer time frames.

IMPACTS ON FEMALE-HEADED HOUSEHOLDS AND OTHER VULNERABLE GROUPS

The study finds few differences in the impact of second-level certification for female-headed households over male-headed households, or between widows and non-widows, across most outcome families. The results do indicate an 11% average increase in the likelihood of female-headed households (and a 12% increase in the likelihood of widows) feeling more secure entering into credit-based business transactions when the transactions occur with a holder of a land certificate. The results additionally show a 44% average increase in wives deciding which crops to grow on land in their possession, and an average increase of 0.32 hectares of land that is held jointly by husbands and wives or by female-headed households. However, the magnitude of positive impacts from second-level certification is generally not as large for female-headed households as it is for male-headed households.

KEY MODIFIERS OF PROGRAM IMPACTS

The results provide some evidence that some of the impacts of second-level certification are modified by the kebele distance to the regional capital or a household's total landholdings. Kebeles closer to city centers and markets tend to experience stronger positive impacts than did more isolated kebeles. The findings highlight the importance of the location of land tenure programming. One policy implication of this finding might be that land tenure programming should be targeted to those areas that have easier access to towns and markets due to proximity, passable roads, or other transport. Access to markets and capital incentivizes land investments and facilitates access to inputs around land investments.

CONSTRAINTS AND LIMITATIONS

Methodological: In 2013, ERC was tasked with completing the endline data collection and analysis for the ELTAP/ELAP impact evaluation. The implementation of two baseline survey waves some years apart, the nature of the baseline survey design, and the level or variability of the indicator at baseline also imposed certain limitations on the potential for strong identification of treatment impacts for some outcomes of interest, such as across agricultural productivity and economic outcomes, as well as some measures of household tenure security. The ERC research team worked to mitigate some of the limitations through modifications to the data collected at endline, which included, for example, shifting to parcel-level data collection for key variables, adding a set of clarifying questions to improve the determination of the household's level of exposure to treatment activities at the time of baseline, and collecting additional details on proximity to land administration offices and other spatial information.

In terms of the analytic approach, the evaluation uses a fixed effects Difference-in-Difference (DID) model to determine program impacts, coupled with entropy weighting to achieve balance across the treatment and comparison groups. The entropy weighting is a form of matching. This analytic step is done to mitigate potential confounding of the impact estimates from factors that reflect decisions about where to implement the program relative to where it was not implemented, and from household characteristics that could relate to potentially different levels of household interest to participate in and ability to benefit from the second-level certification process across recipient and non-recipient households. The matching approach was generally successful in creating balance, thus removing the effect of any differences across treatment and control observations across these factors, for most of the treatment and outcome combinations assessed in the study. The fixed effects DID approach also accounts for any potential confounding due to unobservable factors that remained constant over the evaluation period. However, as with any quasi-experimental DID approach, it is possible that there were unmeasured confounding factors which varied over time, and affected outcomes across the

treatment and comparison groups differently. If such time-varying confounding processes are present, they could introduce bias to the impact estimates reported. However, the evaluation has no indication of the presence of such hypothetical confounders.

Programmatic: Overall, the evaluation results suggest fairly small impacts of second-level certification relative to first-level certification, across the outcomes mentioned above. However, it is also useful to note several constraints that added to the complexity of the evaluation. First, the activities implemented under second-level certification may be considered a more incremental change relative to first-level certification, compared to the change from no certification to first-level certification. Thus, the effects of second-level certification may be more nuanced and difficult to detect over shorter time frames, or may not accrue to households in the short term. Secondly, there is likely substantial variation in program implementation across kebeles and regions, due to the decentralized implementation approach for the program. The average program impacts captured through this evaluation assess the program as implemented on the whole, thus reflecting the net impacts across this variation. However, given that a finer-scale disaggregation of impacts across regions or different implementation strategies was not anticipated at baseline design, the evaluation may not be able to identify more isolated impacts that could align with particular or more effective implementation strategies. Thirdly, the enhanced access to land information and documentation that occurs under second-level certification may also reduce incentives for some households to complete the registration processes over the shorter term. If the costs associated with land taxes or otherwise making household information public outweigh the perceived benefits, then it may be that some households prefer to forgo this activity. It is not clear from the evaluation data if this is an issue in the ELTAP/ELAP program areas but it is relevant to raise this possibility. Nevertheless, even if some of the anticipated benefits of second-level certification are potentially less salient to households over the shorter term, it is likely that digitizing land records may be necessary to support the development of transparent land markets over the longer term and eventually the spread of credit for rural land holders.

Lastly, it is highlighted that the ELTAP and ELAP programs were designed to provide land administration benefits that extend beyond the household level, for example in terms of support to the land registration and record-keeping process that contributes towards the overall long-term sustainability of Ethiopia's land administration system. However, this evaluation was designed to consider only the household-level impacts of the program, relative to first-level certification. Therefore, it is important to highlight that this evaluation should not be viewed as a comprehensive evaluation of all aspects of the second-level certification process. Even if the evaluation did not find large additional impacts to households from second-level certification relative to first-level certification across some of the anticipated household-level benefits, second-level certification may be required to maintain identified benefits of first-level certification. And, there are likely to be broader potential administrative benefits from the program that extend beyond the scope and issues focused on by this particular evaluation.

POLICY RECOMMENDATIONS

The evaluation results suggest fairly small impacts of second-level certification relative to first-level certification, across a small number of credit access, tenure security and female empowerment outcomes. Overall, the impact evaluation findings provide a basis for the following policy recommendations:

1. While second-level certification does seem to increase access to credit, particularly for male-headed households, very few surveyed households obtained any credit for farming purposes. This is not surprising given that a) land may not formally be used as collateral for lending in Ethiopia (though leasehold rights may be used as collateral for lending) and b) commercial lending to small enterprises in Ethiopia is extremely limited. In order to address concerns related to improving access to credit in an environment where land certificates may not be used for secured lending, **policy makers may wish to include a land tenure activity in agribusiness support projects such as [USAID's Agricultural Growth Program-Agribusiness and Market Development \(AGP-AMDe\)](#) effort, which is working to increase lending to farmers' organizations in Ethiopia.** Tying land tenure programming more directly to agribusiness and market development projects may have a mutually reinforcing positive impact, given that such projects often aim to increase credit access and land investment, and establish farmer cooperatives and women's involvement in them. Linked land tenure programming could include efforts to strengthen knowledge on land rights, women's rights to land, and the different ways that land certificates might informally aid cooperative groups or individuals in obtaining credit. For example, donors may particularly wish to support women Farmers' Cooperative Unions in Ethiopia and support efforts to train women on best practices related to leasing agricultural lands while also building capacity to access and effectively manage credit.
2. The evaluation found no evidence for an increase in land rental activity as a result of second-level certification, however this may not be surprising given current provisions which limit the amount of land and time length of land rental contracts. In order to promote "thicker" land rental markets in rural Ethiopia, **policy makers may wish to support efforts to review legal frameworks at the state level for land rentals and, to the extent possible, support revisions to this framework to allow for longer-term leasing and for leasing of larger percentages of a household's land.** Recognizing that there are historical sensitivities related to land accumulation, it may nonetheless be desirable to extend leasehold terms and expand the area that may be leased in order to create more robust incentives for investment of labor and capital and to allow those Ethiopians who lease out land to extend benefits from this activity. It may be useful to consider a radio campaign to educate rural Ethiopians about land values and the legal requirements of land leases as part of such an effort.
3. Given the evidence suggesting an impact of second-level certification on indicators of female empowerment, **policy makers may wish to continue to expand emphasis on joint titling and the issuance of land documentation in both husband and wife's name, for example to areas where joint titling may still be at the discretion of local officials.**
4. Given the fairly large percentage of parcels and households involved in the program for which government was not able to deliver certificates of possession, the evaluation also draws attention to the extent to which second-level certification also rests on activities that may extend beyond the scope of a program's manageable interests, perhaps particularly around the issuance of the formal land documents themselves, which necessarily falls under the purview of government. Given the additional cost to implement second-level certification to completion, and the small magnitude of impacts apparent at this stage, it may be relevant to briefly highlight considerations around program costs relative to household beneficiary impacts, and the sustainability of second-level certification impacts.

From a cost-benefit perspective, it may be noted that while additional benefits to households from second-level certification over first-level certification appear to be fairly small at this stage, relative to what appears to be a fairly large increase in implementation costs over that of the first-level intervention, this does not necessarily suggest that program costs are unwarranted. It is highlighted that from a legal standpoint even if some of the anticipated benefits of second-level certification are potentially less salient to households over the shorter term (as this evaluation may suggest), it is likely that digitizing land records and enhanced longevity and access to land records that is made possible through the second-level process may be necessary to support the development of transparent land markets over the longer term and eventually the spread of credit for rural land holders.

In light of this, and the potential that households which begin the second-level process but do not receive a certificate of possession could be disadvantaged in terms of being able to assert their land claims, perhaps especially for certain types of land challenges that may only emerge over time, as well as to potentially lose faith in program implementation or government land administrators if formal documentation is not received, **policymakers may wish to consider efforts to identify programming gaps and opportunities, for example around capacity, financing, or process for certificate provisioning, as well as enhanced donor coordination around land programming.** Where gaps are identified, policymakers may wish to consider coordinated donor efforts to ensure that new land programming involves such identified components, with a view towards maintaining sustainability of program impacts.

EVALUATION PURPOSE AND EVALUATION QUESTIONS

EVALUATION PURPOSE

Following decades of social, political and economic insecurity marked by conflict, famine, regime change, and land redistribution, in the late 1990's the Government of Ethiopia (GoE) embarked on an ambitious program to document and register lands held by rural households in an effort to increase their tenure security and certify their long-term use rights. Ethiopia's "first-level" land certification program has been widely viewed by a number of donor institutions, practitioners and scholars as one of the most successful low-cost land registration programs in Africa or anywhere else in the world. Recent research suggests that first-level certification has had a positive impact on a variety of economic outcomes (Deininger, Ali, and Alemu, 2011; Hagos and Holden, 2013; Holden, Deininger, and Ghebru, 2009, 2011; Holden and Ghebru, 2013; Melesse and Bulte, 2015). Under first-level certification, land used by households is registered and documented via a participatory process in which neighbors act as witnesses for the demarcation of parcel boundaries. Parcel details are agreed to by parties participating in the process and recorded on paper forms, together with information on the household head, parcel area, location, quality of land, and the names of individuals to whom adjacent parcels belong (Bezu and Holden, 2014).

Despite being an important step in strengthening the tenure security of rural farmers, first-level certification also had a number of shortcomings that prevented it from being a viable long-term solution (Bezu and Holden, 2014). Chief among the perceived limitations is that the first-level certification process did not map individual plots or provide a sufficient level of spatial detail around boundary documentation to allow for the development of cadastral maps for improved land use management and administration. Moreover, the lack of computerized land registries under first-level certification did not enable effective management and updating of registration records.

To address these challenges, USAID began working with the GoE to support "second-level" land certification starting with the Ethiopia Strengthening Land Tenure and Administration Program (ELTAP; running from 2005-2008) and continuing under the Ethiopia Land Administration Program (ELAP; running from 2008-2013). Under the auspices of second-level land certification activities, the ELTAP and ELAP programs aimed to address key limitations of the first-level process. In particular, they piloted the use of handheld GPS devices to map and demarcate parcel boundaries, an element of land tenure administration which was not included in first-level certification activities.

The GoE has significantly scaled-up second-level certification using its own resources and with support from its development partners, including through the UK's Department for International Development (DFID) Land Investment for Transformation (LIFT) Programme, the Responsible and Innovative Land Administration (REILA) project supported by Finland, and the Sustainable Land Management Program II supported by the World Bank. These efforts will be considerably larger in scale than USAID's ELTAP and ELAP programs. Although the GoE will be using a system for delineating boundaries based on

imagery, rather than handheld GPS, as was used for ELTAP and ELAP, there remains a lack of information on the impact second-level certification has over first-level certification.

In addition to addressing the longer term components of a functional land registration process, the implementation of these second-level land certification programs thus provides a unique and important opportunity to generate new knowledge around the impacts of formalized land documentation on household-level development outcomes. This will in turn contribute towards enhanced policy and programming and provide insights on the role of land rights clarification and enhancement in meeting broader development objectives.

To fill this evidence gap, and to inform future programs and policy formulation, this impact evaluation focuses on measuring the impact of second-level land certification relative to first-level land certification, which has already reached the majority of rural smallholders in the Highland regions of Ethiopia (Amhara, Oromia, Southern Nations Nationalities and Peoples, and Tigray). In the context of the larger policy dialogue around land tenure strengthening and its potential roles in mitigating a range of development challenges, and with the aim of contributing to the broad question within the land tenure community of “how secure is ‘secure enough’?”, the overarching question that underlies and motivates this evaluation is:

“Does second-level land certification marginally increase tenure security and improve rural livelihoods as compared to first-level land certification?”

EVALUATION QUESTIONS

In addition to understanding determinants of security of tenure in general, and the impact of second-level land certification in particular, USAID and the GoE initially expressed interest in generating knowledge across three potential focal areas:

1. Implementation-oriented knowledge that assesses the process and performance of program delivery;
2. Impact-oriented knowledge that assesses changes in land tenure security, livelihoods and related measures of economic well-being of beneficiaries that are attributable to the second-level certification intervention; or
3. Efficiency-oriented knowledge that combines process and impact to investigate the cost-effectiveness of outcomes, such as the relationship of cost of service delivery to changes in household-level income.

This evaluation is concerned with the second focal area: assessing the impact of second-level certification relative to first-level impacts across a range of household-level outcomes. The evaluation focuses on the four broad questions outlined below, which are used to specify a series of testable hypotheses around which the evaluation analyses are structured.

- Q-I. What are the marginal welfare and tenure security benefits to households from second-level certification, relative to first-level certification?
- Q-II. How, if at all, have second-level land certificates been used as proof of ownership, and is their use different from that of first-level land certificates?
- Q-III. How do beneficiaries, including landholders and local government officials, perceive the value of first- and second-level certifications?
- Q-IV. How has second-level certification affected intra-household welfare differently from first-level land certification?

PROGRAM BACKGROUND

DEVELOPMENT CHALLENGE

In 1998, the Government of Ethiopia embarked on a rural land registration program to increase the tenure security and certify the long-term use rights of rural households in Tigray followed by Amhara (2002), and Oromia and the Southern Nations Nationalities and Peoples (SNNP) regions (2004). Ethiopia's first-level land certification program has been highlighted by donors, scholars and practitioners as one of the more successful and cost effective land registration programs in Africa. The estimated cost of Ethiopia's first-level certification is reported to be approximately US\$1 per parcel (Alemu, 2006; Deininger, Ali, Holden, and Zevenbergen, 2008; Land Equity International, 2006)². In addition to being considered one of the least costly land registration programs in Africa and elsewhere (Deininger et al., 2008), Ethiopia's first-level land certification program was quickly scaled up and covered a large number of households in a relatively short period of time. By the mid-2000s, approximately 20 million plots were registered from 6 million households (Deininger et al., 2008), with upwards of 12 million households covered by the end of the decade (Hailu and Harris, 2013).

The Ministry of Agriculture's Land Use Directorate estimates that 90% of farming households have first-level land certification (MoA, 2013). Often associated with the 'green books'³ issued to households as a record of their land holdings and rights, research to date suggests that first-level certification has had a positive impact on a variety of economic outcomes. Among the key findings are increased investment and land productivity (Holden et al., 2009), increased land rental market activity (Deininger et al., 2011; Holden et al., 2011), as well as increased women's participation in land market activity and even improved child nutrition (Holden and Ghebru, 2013).

Despite being an extremely important step in strengthening the tenure security of households, which had been subjected to the uncertainty of land redistribution in the previous decades, first-level certification is not generally viewed as sufficient for the long-term (Bezu and Holden, 2014). Chief among the perceived limitations is that the first-level certification process did not map individual plots or provide a sufficient level of spatial detail around boundary documentation to allow for the development of cadastral maps for improved land use management and administration. Moreover, the lack of computerized land registries further complicates the management and updating of registration records.

2 By comparison, low-cost estimates for land titling in West Africa are in the range of US\$7-10 per parcel (Lavigne-Delville, 2006). Depending on the scale at which titling is taking place, in Madagascar the costs of issuing titles on an on-demand-basis range from US\$150 to US\$350 per parcel (Jacoby and Minten, 2007; Teyssier, Raharison, and Ravelomanantsoa, 2006), with low-cost estimates under a systematic approach in the range of US\$7-28 per parcel (World Bank, 2006). In Uganda, the cost of issuing customary land certificates is US\$40 per parcel (Deininger et al., 2008). Outside of Africa, the cost of first-time registration ranges widely from of US\$10-13 per parcel (in Moldova and Peru respectively) to over US\$1,000 on the high-end (\$1,064 for Trinidad and Tobago and \$1,354 in Latvia) (Burns, 2007).

3 Green booklets were issued in Oromia and SNNP while in Tigray these were blue (Deininger et al., 2008)

SECOND-LEVEL LAND CERTIFICATION

To incorporate the necessary geographic information system (GIS) detail, generate parcel maps, computerize land records, and strengthen rural land administration system in general, the Government of Ethiopia (GoE) collaborated with USAID and other development partners, including the Swedish International Development Cooperation Agency (SIDA), the World Bank, the United Kingdom's Department for International Development, and the Government of Finland under the Responsible and Innovative Land Administration Project (REILA) to explore alternative approaches under what has been termed "second-level land certification." The GoE plans to provide second-level certification for an estimated 50 million land parcels (Hailu and Harris, 2013).

USAID supported both the Ethiopia Strengthening Land Tenure and Administration Program (ELTAP: 2005-2008) and the Ethiopia Land Administration Program (ELAP: 2008-2013) to help GoE implement a sound land certification system.

The main objective of ELTAP was to assist the GoE to implement a land certification system that provided holders of rural land use rights with robust and enforceable tenure security in land and related natural resources, in the four regional states of Amhara, Oromia, SNNP, and Tigray (USAID, 2008). Four ELTAP components supported this objective:

- Component 1: Land Certification and Administration;
- Component 2: Public Information and Awareness;
- Component 3: Security of Land Tenure and Dispute Resolution; and
- Component 4: Policy Development and Program Integration.

Following the end of ELTAP in 2008, USAID support for a second-level certification process that relied on the use of handheld GPS units to demarcate plot boundaries continued under ELAP, which ran from August 2008 to February 2013. Under ELAP, USAID worked with the Government of Ethiopia to strengthen and enhance rural land tenure security and land administration through four components (USAID, 2013):

- Component 1: Strengthening the legal framework on land administration;
- Component 2: Promoting tenure security to enhance land investment in high potential areas;
- Component 3: Increasing public information and awareness; and
- Component 4: Strengthening the capacity of land administration institutions.

ELAP used the same methods as ELTAP for mapping parcels, which involved recording parcel boundaries based on readings taken with handheld GPS devices. One important distinction between the two programs deals with the areas targeted for second-level activities. Under ELAP, certification efforts were focused on areas with high agricultural production and investment potential. The criteria used to select implementation areas for second-level certification activities under ELAP were (USAID, 2013):

- High agricultural potential in terms of high rainfall, irrigation, and cash crops grown;
- High land transaction in terms of renting and sharecropping;
- Good infrastructure and access to markets; and,
- Presence of agricultural investors (all woredas were deemed to have met this criterion).

Thus, the extent to which ELTAP and ELAP may have had differential impacts on key outcomes is also a question of interest for this impact evaluation.

Under ELTAP, second-level cadastral surveying and registration of rural land started in Amhara and Oromia regions during the first quarter of 2007, followed by Tigray and SNNP regions in the second quarter. Through the end of May 2008, a total of 147,449 households were visited from six *woredas* in each region—24 in total. Over the course of ELTAP, the boundaries of 704,754 parcels were mapped using GPS devices and registered with the land administration office. By the end of the program, approximately 56% of these parcels had been formally issued a certificate. For the ELAP follow-on program, 192,184 individual parcels were certified across 89,178 households, comprising 63% of the program's target by program end (USAID, 2013). Of this total number of parcels certified under ELAP, 29% of them (56,095 parcels) were parcels that had been registered and surveyed under ELTAP but certified under ELAP. The remaining 136,089 parcels were surveyed and certified entirely under ELAP (USAID, 2008; USAID, 2013).

EXPECTED PATHWAYS TO IMPACT

This section briefly outlines the theory of change logic around how second-level certification may be expected to lead to enhanced development impacts for rural smallholders. Potential pathways to additional impacts above those realized under first-level certification are discussed for five broad sets of development outcomes envisioned to be impacted by the program: land transactions and access to financing; land disputes and conflict; land management and soil conservation; agricultural investment and productivity outcomes.

LAND TRANSACTIONS AND ACCESS TO FINANCING

The Ethiopian land policy at the time of first-level land certification allowed rural households to legally rent out their land (Adgo et al., 2014). Empirical research has shown that activity in land rental markets increased as a result of the introduction of first-level certification (Deininger et al., 2011; Holden et al., 2011). Although land leasing was already permitted under the first-level program, the additional information on specific parcel details that is made available through the second-level process, notably the size of the parcel and a map of the boundaries, could potentially reduce information asymmetries between renter and lessee by verifying key information, thereby allowing the parties to enter into a formal or informal contract that might not otherwise have taken place. Second-level certification is also expected to increase the incentive for widows and women-headed households to engage in renting and sharecropping activity. Prior to receiving certification, women often limited such activity to relatives out of concern that the renter/sharecropper might claim the land use right as his own after establishing use for several years. Second-level certification is viewed as providing women with additional assurance and documentation of their rights, and thus may increase women's willingness to engage in these types of short-term, temporary transfers of land rights.

Although some land transactions, such as renting/leasing and sharecropping, are allowed, this does not apply to buying, selling, or mortgaging of land, which are still illegal in Ethiopia. Although land cannot be used as collateral to secure a loan, research in other contexts does suggest that informal financial institutions can be an effective alternative in supporting smallholder credit access to promote investment in new technologies. Informal means, such as financing provided collectively by a local group and using norms of social accountability as an enforcement mechanism, is one such model (Knox, Meinzen-Dick, and Hazell, 2002). In Ethiopia, the suggestion is that issuance of second-level certificates could make it easier for small landholders to obtain micro-financing. Rather than being used as collateral in the formal sense—implying that a bank could repossess land used as collateral on an unpaid loan—credit is often

accessed through informal mechanisms, where the land certificate may provide a signal that the borrower is attached to a place and likely committed to improving his or her productivity on that land, and perhaps conveying capacity and ability for repayment. In such contexts, often the lender relies on group pressure or other extra-legal means for enforcement of repayment, thus the certificate details may also reassure the lender on ability to enforce repayment. It is also possible that second-level certificates could facilitate access to credit by reducing the transaction costs associated with obtaining credit, such as by making it easier to verify information such as plot size and related details.

LAND DISPUTES AND CONFLICT

In countries like Ethiopia, where livelihoods for most rural residents derive from land, land-related conflicts over ownership and boundary disputes can be particularly harmful and undermine productive activities. Although empirical evidence demonstrating a strong link between strengthened land rights and reduced land conflict is relatively scarce, some studies do indicate that land registration programs can have the ability to reduce boundary disputes and litigation arising from such conflicts. In Ethiopia, there is evidence that first-level land registration and certification reduced the number of conflicts arising from border and inheritance disputes (Giri, 2010; Holden and Tefera, 2008; Holden, Deininger and Ghebru, 2011). A basic premise of stronger and more secure land tenure is that the enforcement of these rights lessens the risk of being forcibly displaced and allows for a level of long-term security and a sense of permanence that encourages land-related investment (Besley, 1995). Increased tenure security is also thought to reduce the need for smallholders to expend resources to defend their land claims, which can be particularly important for women and other vulnerable groups whose rights may not be sufficiently protected under traditional practices (Joireman, 2008).

LAND MANAGEMENT AND SOIL CONSERVATION

A basic premise of stronger and more secure land tenure is that the clarification of land rights, together with the associated potential to more easily demonstrate claims and enforce rights, lessens the risk to landholders of being forcibly displaced from their land. It also allows for a degree of long-term security and a sense of permanence that is thought to encourage new and different types of land-related investments (Besley, 1995, including those which may require greater labor or resources outlays upfront. Several studies suggest that first-level land certification programs in Ethiopia induced better land management practices (e.g., tree planting, construction of stone terraces) and ultimately improved land productivity (Deininger et al., 2011; Holden et al., 2009). Reduced soil erosion and nutrient loss as a result of these land practices have been indicated as potential mechanisms for productivity enhancements in some areas of Ethiopia (Ghebru and Holden, 2015). It is expected that the additional surety over landholdings that households are expected to obtain under second-level certification relative to first-level certification would likely further reinforce the positive incentives for land decisions that apparently have led to improved land management and productivity under the first-level process. However, whether land certification on its own is enough to induce soil conservation practices directly or whether this is a secondary consideration resulting from some other primary (e.g., economic) objective is not clear. The finding by Kahsay (2011) that land certification's impact on soil conservation depends on household characteristics, such as off-farm economic opportunities and household labor, further highlights the difficulties of isolating this impact.

AGRICULTURAL INVESTMENT AND PRODUCTIVITY OUTCOMES

Although the knowledge base remains unresolved on whether secure land tenure alone is sufficient to induce increased agricultural investment (e.g., improved seeds and fertilizers, or adoption of new technologies), it is widely hypothesized to be a necessary condition for individuals to undertake productivity-enhancing investments on their land. Numerous studies have suggested positive impacts of greater land tenure security on agricultural outcomes and investment in rural land (Deininger et al., 2011; Deininger and Chamorro, 2004; Feder, Chalamwong, Onchan, and Hongladarom, 1988; Holden et al., 2009; Jacoby, Li, and Rozelle, 2002; Rozelle and Swinnen, 2004). Nevertheless, there remains great uncertainty around the nature of this relationship, and much empirical work is ultimately indeterminate—particularly in contexts where land markets are fairly nascent, and land cannot be used as collateral (Place, 2009; Arnot et al., 2011; Lawry et al., 2014). In Ethiopia, research to date suggests that first-level land certification increased agricultural investment at individual as well as community levels (Deininger et al., 2008; Holden et al., 2009) and that farms with certified land tended to be more productive than those that were not (Ghebru and Holden, 2008; Ghebru and Holden, 2015). The higher productivity was attributed to the use of better inputs, such as superior cultivars, pesticides, and synthetic fertilizers. Even as work continues to better elucidate the mechanisms by which first-level certification in Ethiopia may have worked to generate positive investment and agricultural productivity impacts, the expectation under second-level certification is that the additional security over land holdings, and the formalized and permanent documentation of land rights that is expected to be further strengthened under the second-level process, would further reinforce the incentives for smallholders to make such changes in their land-based decisions.

EVALUATION METHODS AND LIMITATIONS

EVALUATION DESIGN

This impact evaluation uses a quasi-experimental Difference-in-Difference (DID) approach with entropy balancing to identify the impacts of second-level certification over those of first-level certification on a range of household beneficiary outcomes. Under a quasi-experimental approach, program impacts are determined by drawing on outcome information across a group of beneficiaries who received the program intervention, or treatment (in this case, second-level certification), and the same set of outcome information collected from a group of comparable households that did not receive the treatment (i.e., the control group, in this case households that only received first-level certification). The control group serves as a counterfactual for the treatment group, essentially providing information on what *would have happened* to households in the treatment group, had they *not* received the program intervention. Thus, for the analyses to be credible and robust, households in the control group should be as similar as possible to those in the treatment group across important characteristics that also shape the outcomes of interest under the program. As this evaluation is tasked with identifying impacts of second-level certification over first-level certification, the control group for the analyses consists of households which received first-level certification.

Under the DID approach, data are collected from treatment and control households prior to the start of the program (the baseline wave of data collection) and at endline, after the program has concluded. To further improve the impact evaluation's power to detect impacts that are truly attributable to the program itself rather than from other confounding influences, it is preferable to collect these data from the same households at baseline and endline, referred to as a panel data set. Under this design, the DID method generates an estimate of program impacts that is based on the difference in the average household-level change in outcomes over the baseline and endline periods, across households in the treated and control groups.

Second-level certification (particularly under ELAP) was targeted towards areas that shared certain characteristics deemed by USAID to facilitate program success. This non-random implementation of the program to areas that program implementers considered to be more likely to produce positive outcomes under the program introduces potential 'selection bias', whereby areas targeted to receive the program may be more likely to have improved outcomes than areas that did not receive the program, due to differences in their underlying context. Selection bias can be a source of confounding around the true effect of the program, if analytic steps are not taken to address it. To address this potential source of bias and improve the accuracy of impact estimates, the study couples the DID approach with an entropy balancing approach. Entropy balancing reweights household observations in the control group to achieve balance across treatment and control groups on variables which proxy the selection characteristics used for program implementation, as well as other household characteristics that could relate to household interest in and ability to benefit from their participation in the second-

level certification process. By creating a control group that is similar to the treatment group on these potentially confounding characteristics, this approach generates a stronger counterfactual and better mitigates potential confounding of program impacts that could have been introduced by the non-random implementation of the program to areas with facilitating characteristics. As mentioned earlier, these characteristics were: (1) high agricultural potential, described in terms of higher rainfall, irrigation and cash crops grown; (2) high land transaction activity, in terms of renting and sharecropping land; (3) good infrastructure and access to markets; and (4) with the presence of agricultural investors (however, program administrators indicated that all woredas were deemed to meet this last criteria, thus this criteria was not considered to be a strong source of potential selection bias). The study thus employs robust econometric methods to mitigate the potential confounding effects of selection bias to the extent possible. However, as with all quasi-experimental DID designs, if there are unmeasured confounders which affected the treatment and comparison groups differently over the time frame of the evaluation, and also affected any of the outcomes, such confounders could result in biased estimates of program impacts for those outcomes.

The baseline survey development, evaluation design and survey methodology were implemented prior to ERC involvement. The development of the baseline survey instruments, sample design, and collection of the baseline data was carried out in two separate waves in 2007 and 2012 by the Ethiopian Economics Association (EEA). In 2013, ERC was tasked with completing the endline data collection and analysis for the ELTAP/ELAP impact evaluation.

There are several important limitations to the baseline design and instruments. Baseline data was not collected at the field or parcel level, which reduces or eliminates the study's ability to rigorously assess certain field-based measures. The ELTAP baseline survey also contains more limited data on key outcomes, compared to the ELAP baseline survey. Both baseline survey waves utilized the same core household survey modules, however, the 2012 ELAP baseline survey expanded on key issues. This included, for example, more specific questions on household expectations for certification program impacts, expanded questions about land rented in and out, and the nature of household rights on communal land. However, the discrepancy in the resolution or presence of certain variables across the baseline and endline datasets has implications for sample size and the ability to fully utilize certain finer resolution baseline data for the evaluation.

Overall, the baseline data collection and design predated USAID's 2011 Evaluation Policy, which emphasized a set of rigorous impact evaluation design issues that had not been at the forefront of data collection concerns previously and also has some implications for the analysis options available at endline. The implementation of two baseline survey waves some years apart, and the nature of the baseline survey design, imposed certain limitations on the potential for strong identification of treatment impacts. The ERC research team worked to mitigate some of the limitations through modifications to the data collected at endline, which included, for example, shifting to parcel-level data collection for key variables, adding a set of clarifying questions to improve the determination the household's level of exposure to treatment activities at the time of baseline, and collecting additional details on proximity to land administration offices and other spatial information.

OUTCOME FAMILIES, HYPOTHESES AND INDICATORS

The study tested a series of hypotheses to examine the impacts of second-level certification on a set of development goals across six families of outcomes: access to credit; land disputes; land rental activity; investment in productive assets; soil and water conservation investments; tenure security, and female involvement in land management and decision-making⁴. For each outcome family, a set of indicators are specified, which were used to measure and track changes at the household level across baseline and endline data collection. The hypotheses and indicators for each outcome family are listed below in Table 2. Ultimately, the study did not assess indicators regarding investment in productive assets (H-4), due to limitations in the baseline data⁵.

⁴ Note that the initial IE design report included a hypothesis around agricultural productivity, however a focus on measuring this outcome was dropped for the endline analysis due to the limitation posed by having parcel-level data around relevant agricultural measures at endline but not at the baseline, related concerns over the accuracy of productivity measures generated therein, and the lower likelihood of detecting an impact for this longer term outcome during the relatively short time frame of this impact evaluation.

⁵ As designed at baseline, indicators under this hypothesis focused on changes in tree planting activity and fertilizer use. However, the construction of variables for the endline analysis was ultimately deemed unreliable either due to (1) the nature of question design and data collection at baseline, or (2) because the data were viewed to be weak indicators of intended changes as a result of second-level certification. Tree planting was collected across a set of categories that were not mutually exclusive, while preliminary analyses suggested low reliability of these data for the purposes of assessing certification impacts on farmer tree investments. For example, it was not possible to control with confidence for the number of trees a farmer planted voluntarily, or was required to plant as part of a government conservation program. In addition, there was a > 50% decline in farmer reported tree survivorship at endline relative to baseline that was irrespective of treatment status or program round. This suggested either large measurement or reporting differences for these data across the data waves, or the presence of broader landscape processes that could be contributing to tree planting and survival over the evaluation time frame. Fertilizer use was ultimately deemed a weak indicator of second-level certification impacts on productive assets, due to independent fertilizer subsidy programs operating in at least some of the study areas, and the inability to discern from the household data whether and to what extent households had also participated in such subsidy programs to obtain fertilizers.

TABLE 2. EVALUATION HYPOTHESES AND INDICATORS**H-1: Second-level land certification increases household access to credit (i.e., micro-finance)****Indicators:**

- A. Total amount of credit obtained in Birr, in past 24 months
- B. Total amount of credit households took for farming purposes in past 24 months
- C. Whether households/ proportion of households that used any form of land certificate to secure credit in past 24 months

H-2: Second-level land certification reduces the number of land-related disputes and dispute resolution time**Indicators:**

- A. Number of land-related disputes
- B. Mean severity of disputes experienced by the household (endline only)
- C. Average time taken to resolve disputes experienced by the household

H-3: Second-level certification increases the likelihood that households engage in land rental and sharecropping activities**Indicators:**

- A. Number of parcels rented out by households
- B. Amount of land (ha) rented out by households
- C. Whether / proportion of households renting land out to non-relatives or friends
- D. Amount of land that households rent out to non-relatives or friends
- E. Monetary payment received in Birr/ha for land rented out in last 12 months
- F. Monetary payment in Birr/ha for the largest parcel of land rented out

H-4: Second-level land certification increases household investment in productive assets—short and long-term**Indicators:**

- A. Household average number of trees planted per ha
- B. Household average share of area planted to perennial crops
- C. Household average use of improved farm inputs per ha

H-5: Second-level land certification encourages households to invest more in soil and water conservation (swc)**Indicators:**

- A. Average length of hedges, bunds, and ditches constructed
- B. Average length of soil bunds stabilized with vegetation
- C. Average number of water retention structures constructed

H-6: Second-level certification results in stronger perceived tenure security for women and men**Indicators:**

- A. Household belief it has right to bequeath land under its possession
- B. Household belief that the land certificate program will have a positive impact on:
 - a. tenure security
 - b. land investment
 - c. land renting
 - d. security of entering into business transactions
- C. Household belief that land currently under its possession will remain under their control
- D. Household belief that land redistribution within the kebele is unlikely over the next 5 years

H-7: Second-level certification increases women's involvement in land management and decision-making activities**Indicators:**

- A. Hectares of land (proportion of household's total landholding), and number of parcels within the household:
 - a. That are possessed by husband and wife jointly, or wife only
 - b. Which have a certificate held by husband and wife jointly, or wife only
 - c. For which decisions on which crops to grow is made by husband and wife jointly, or wife only
 - d. For which decisions on land transfers to others are made by husband and wife jointly, or wife only

SAMPLING DETAILS AND DATA COLLECTION

Please refer to Annex VI—Baseline Reports and Annex VII—Design Report for detailed sampling information on baseline and endline data collection. The baseline data collection strategy and instrument design was conducted by EEA. Survey instruments included a baseline household survey and separate wives survey. For ELTAP, treatment and control kebeles within districts were selected for sampling at baseline using stratified systematic selection on the basis of distance from woreda capital and access to main roads (EEA, 2013). For ELAP, treatment kebeles for sampling were selected on the basis of agricultural and investment potential, while control kebeles were selected randomly (EEA, 2013). Under both baselines, households were selected for surveying within each kebele from village registries, using stratified random sampling proportionate to the number of male and female-headed households in the kebele, to ensure inclusion of a sufficient number of female-headed households in the sample (EEA, 2013).

The baseline survey was designed to sample a certain number of treatment and control kebeles, drawing on administrative data provided by regional authorities. Some of this information was found to be outdated during the baseline sampling, such that kebele status as treated or control at the time of sampling sometimes differed from anticipated. The baseline survey also encountered kebeles where some households had received treatment and others had not. The resulting baseline sample of household and kebeles across treatment and control therefore differed somewhat from the initial sample design. Given the panel design, this sample then determined the overall sample for the evaluation. The endline evaluation team did not find major issues with baseline data quality, for example in terms of extent or patterns related to missing observations or outlier responses. Some potentially useful variables did have a high proportion of missing data which made them infeasible to use. Or, there were inconsistencies across the baseline and endline data that suggested substantial measurement variability across the data waves. However, given that the team did not have access to all of the raw baseline data, or involvement in field or data entry quality control procedures, the team's ability to assess broader aspects of baseline data quality is necessarily limited. Endline data collection instruments under ERC included a household survey, a wives survey, a community-level key informant survey, and a short questionnaire administered to representatives from *woreda* land administration offices. The endline surveys were administered to the households sampled at baseline, per the panel data design. Given the panel design for the evaluation, the endline household survey necessarily conformed to the baseline instruments, however additional questions were added around key issues of interest, including:

- Additional parcel-level detail on household land holdings, land rental and sharecropping activity, land-related disagreements, use of land to obtain credit, temporary and permanent changes in land tenure, and whether or not these changes have been registered.
- Questions on accessibility of the woreda land administration office (i.e., distance to and costs associated with visiting the land administration office).
- The wives survey component included parcel rosters to provide detail on decision-making over land use and management, and disagreements.
- Additional household details, including household coordinates (latitude and longitude) collected via GPS, and follow-up contact information.

As for the baseline process, the endline data collection did not raise major issues around data quality. Discrepancies between anticipated and actual treatment status of households across expected treatment categories was also encountered during the endline sampling. Overall, the fact that at endline many of the second-level households had not received the full second-level treatment remains the greater

concern for the evaluation, because it weakens the potential to accurately detect true program effects if they exist. For this study, the variation in actual treatment received by different households resulted in a smaller sample size across the treatment category of interest than the evaluation planned for, and thus introduced limitations on the extent of the evaluation's ability to identify finer-grained effects of second-level certification on some household-level outcomes of interest. Given this variation in treatment, the evaluation assessed impacts across the different individual and combined levels of second-level certification received by households. The study was powered to detect medium to large-scale program impacts if they existed, for nearly all of the 20 outcome indicators assessed, under any of the four different treatment definitions that were used in the study. For two of the four treatment definitions used, the study was further powered to detect fairly fine-scale and program-relevant effect sizes if they existed, for nearly all indicators assessed.⁶

EVALUATION LIMITATIONS: PROGRAM IMPLEMENTATION NOTES

Impact evaluations are designed around anticipated programming as described prior to implementation, but actual implementation can often differ from this planning. These deviations can have implications for the extent to which the impact evaluation can meet initial objectives. The key program implementation issue to note for ELTAP/ELAP is that many of the households that were targeted for second-level certification did not ultimately receive the full intended treatment, because they did not receive a formal land certificate at program end. The issuance of the land certificates is the purview of Government, and therefore deemed to be beyond the program's manageable interest. According to available information, resource constraints prevented the GoE from issuing land certificates to a substantial number of households that had been tracked since baseline and were planned for full second-level certification. For these households, program documentation indicates that participation and exposure to the process was the same as for the fully certified households under the second-level process, including the participatory land survey process. The difference is that these households did not receive a formal land certificate document at the conclusion of the process. Thus, the evaluation data contains households that received this "partial" treatment (i.e., land registration and surveying via the second-level process, but a land certificate was not issued), and those which received "full" treatment under second-level certification (i.e., land registration and surveying, and a land certificate was issued). From an impact evaluation perspective, this situation raises complications for the analyses, because the so-called "partial" treatment households received most elements of second-level certification, but not the key final product which confirms their land use rights. Moreover, it is possible that households in this group vary in their perception of why the land certificate document was not issued, or whether it may still be issued to them in future, which may differentially impact their land-related decisions.

Thus, household outcomes, while likely to be materially similar over the short term to those of the households that received the full intended treatment, could also differ at this relatively early post-implementation stage, due to the different experience they had with the certification process and because they did not actually receive formal land documentation. For example, this could reduce household trust in the land program or government, which could have knock-on effects for household trust in the overall process, and any potential gains from behavior change and decision-making that may have been incentivized by other elements of the second-level process. Additional analysis was conducted to assess impacts across these two groups combined, as well as treating these two second-level certification groups separately. It is important to consider these as two separate treatments, given

⁶ Please see Annex II for additional discussion on study power.

the nature of the difference in treatment. The drawback from this approach, from an evaluation perspective, is a smaller sample size available for each disaggregated analysis and reduced power of study to detect fine scale changes. However, even with these smaller sample sizes, the study does maintain sufficient power to detect medium to large impacts if they exist (see power calculation discussion in Annex II).

Secondly, it is also relevant to note that the ELTAP baseline data was collected in the 4th quarter of 2007, prior to the program issuing land certificates to households in 2008, but not before some households in the treatment sample had begun to receive some of the intended treatment activities under the second-level certification process, which began in 2007. For ELTAP, treatment and control kebeles were selected for sampling using the same stratified systematic selection criteria (EEA 2013). For the ELAP baseline, data was collected roughly two years into the start of program activities, also prior to the issuing of land certificates. In addition, as also mentioned in the program background section, program implementers used a non-random process to target kebeles that were deemed to have (1) high agricultural potential, described in terms of higher rainfall, irrigation and cash crops grown; (2) high land transaction activity, in terms of renting and sharecropping land; (3) good infrastructure and access to markets; and (4) with the presence of agricultural investors (noting that all woredas were deemed to meet this last criteria). Control kebeles for the evaluation were selected at random, however. This selection bias around kebeles that received the treatment introduces a need to explicitly account for the additional influence of these confounding factors. The following section presents the analysis strategy for mitigating this selection bias.

Lastly, there is likely substantial variation in program implementation across kebeles and regions, due to the decentralized implementation approach for the program (Deininger et al., 2008). The average program impacts captured through this evaluation assess the program as implemented on the whole, thus reflecting the net impacts across this variation. However, given that a finer-scale disaggregation of impacts across regions or different implementation strategies was not anticipated at baseline design, the evaluation may not be able to identify more isolated impacts that could align with particular or more effective implementation strategies. The evaluation did consider an ex-post disaggregation of impacts by Tigray region compared to the other three regions of implementation, since first-level certification began several years earlier there, whereas in the other three regions second-level certification was implemented only shortly after or in lieu of first-level certification. In addition to this variation in extent of household exposure to the first- and second-level certification, there are also variations in the details contained in the land certificate documentation provided to households, while the decentralized nature of implementation could also be associated with substantial variations in the quality of the process. However, obtaining sufficient power to adequately assess whether there are differences in program impacts due to these finer-scale implementation variations across regions would have required a substantial modification to the IE design at the time of the baseline, namely a large increase in the number of kebeles and households sampled at baseline (and again at endline), within each region.

ANALYTIC APPROACHES

The study adopts two statistical approaches to estimate the average treatment effects of second-level certification on the outcome families described above: a difference-in-difference (DID) approach and a non-parametric entropy balancing approach. For each outcome family described above, the evaluation estimates impacts across a select set of indicators that represent the strongest or most direct measures available from the survey data. The selected indicators are also expected to have more immediate impacts over the 3-7 year time frame between baseline and endline.

DIFFERENCE-IN-DIFFERENCE APPROACH

The study uses a difference-in-difference (DID) estimator with panel data and fixed effects. The general frame of the model is:

$$Y_{it} = \beta_1 \text{Time}_t + \beta_2 \text{Treatment}_{it} + \eta_i + e_{it},$$

where Y is the outcome of interest at time t for household i and η are household-level fixed effects. The constant β_2 is the main estimate of interest; it represents the estimate of the treatment effect. Cluster robust standard errors are used, by kebele, to account for serial correlation in responses across households within the same kebele.

The DID approach controls for time invariant differences between treatment and control groups; this includes unobserved characteristics and those which have not been taken into account in the entropy balancing. The DID approach also assumes that the change in mean outcomes for control and treatment households would have followed a similar trend in the absence of the treatment. In other words, kebeles are assumed to have parallel trends in broader contextual factors that also influence the outcomes expected under land certification.

Analysis of pre-treatment covariates suggests that this key assumption may not hold for the ELTAP/ELAP program. Preliminary analysis showed relatively poor overlap in distributions of several of these covariates across the pool of treated and control households in the sample, particularly on some geospatial characteristics related to market access and agricultural potential that could have an important influence on outcomes (See Annex II, Figures 2.6–2.16, in which there is a statistically significant difference between treatment and control groups on proxies for baseline market access and agricultural potential for several of the outcome indicators, before entropy balancing). These underlying distributions for key pre-treatment covariates suggested that second-level certification may have been implemented in places that were already, on average, doing better across certain indicators of household development outcomes, or better situated in terms of markets or potential agricultural investments that households might make. While this non-random implementation of second-level certification is very understandable from a programming perspective, it does introduce additional challenges for rigorous estimation of program effects, as it is difficult to account for the full range of unobservable differences across treatment and control kebeles.

When programs are implemented non-randomly, the assumption in the program evaluation literature is that selection issues and unobserved endogeneity are likely to drive results unless they are explicitly addressed in the modeling. For ELTAP/ELAP, since the analyses suggest there is clear imbalance across treatment and control groups on at least some key characteristics related to market access and agricultural potential (for example, distance to major urban centers or the regional capital; and variables related to agricultural potential, such as soil quality, annual precipitation, temperature and elevation), the

analytic strategy used by this evaluation employed techniques which better account for this confounding. This includes the use of fixed effects models, and adding an entropy-balancing procedure to re-weight observations as a form of matching (further described below). These analytic steps increase the confidence that the impact estimates which are obtained under the entropy-weighted fixed effects DID model are indeed attributable to second-level certification and not to confounding influences.

MATCHING APPROACHES

Matching techniques essentially aim to mimic a randomized experiment by ensuring that the treatment and control groups have similar distributions in observed characteristics (Hainmueller, 2011). The aim of preprocessing with matching and reweighting is to improve the covariate balance between treatment and control groups. However, unlike randomized experiments, matching relies on the assumption of selection on observables—that *all* of the relevant variables used to assign treatment are included in the matching. In most observational studies, this assumption is implausible because the process used to assign treatment is unknown.

Fortunately, the identification strategy for this analysis is strengthened because there is an understanding of the process used by program implementers to select the woredas and kebeles in each region that received second-level certification. Program documentation indicates that assignment to treatment (first- and second-level certification) was based on the following characteristics, for ELAP:

- High agricultural potential in terms of high rainfall, irrigation, and cash crops grown;
- High land transaction in terms of renting and sharecropping;
- Good infrastructure and access to markets;
- Presence of agricultural investors.

The set of pretreatment covariates prioritized to match on therefore included household and kebele-level variables that served as indicators for these characteristics, as well as other important household characteristics that could relate both to a household's interest in participating in and benefiting from the second-level certification process. Geospatial characteristics that were used to indicate agricultural potential were soil quality, slope, elevation, and mean annual temperature and precipitation. Distance to urban centers and to the regional capital were included to additionally indicate broader village context and market access. Factors at the household level were household literacy, family size, gender of household head, and prior experience with land expropriation. The list of covariates, and their balance characteristics across treatment and control groups before and after entropy balancing, is elaborated in Annex II, Figures 2.6-2.16. The figures demonstrate that entropy balancing effectively reweighted observations such that differences among treatment and control groups on these key potential confounders were no longer significant, for nearly all outcome indicators and treatment groups used. Three different techniques for matching and reweighting observations were explored (further described in Annex II). Entropy balancing was ultimately used because it yielded the best reduction in bias across important potential confounders (Austin, 2009).

The main data for the analyses is from the ELTAP/ELAP baseline and endline surveys. The study drew on additional covariates to measure agricultural potential at baseline, including average rainfall, average temperature, elevation, and terrain roughness, drawn from interpolations by the WorldClim project at UC Berkeley (Hijmans et al., 2005).

HETEROGENEOUS TREATMENT EFFECTS

The study also examined heterogeneity in treatment effects for a set of seven program relevant factors⁷. These were:

1. Female-headed vs male-headed households
2. Widows vs other households
3. ELTAP vs ELAP rounds
4. Total landholding at baseline
5. Household distance to regional capital city
6. Household wealth status
7. Age of household head (impacts on youth-headed households⁸ are also captured here)

The approach for identifying key subgroups was drawn from theory and informed by prior empirical work around certification efforts. From implementation and programming perspectives, the study worked from the expectation that second-level certification was expected to further strengthen household security over their landholdings, and related impacts, due to technological improvements of the second-level certification process relative to first-level. This included benefits which might accrue because the spatial boundaries of households' land parcels are delineated more exactly and because the computerized process for second-level certification aids in maintaining permanent records and legacies of ownership that were not possible with the paper-based system of the first-level (Bezu and Holden, 2014). Although, as Bezu and Holden point out, it is possible that some of the perceived strengths of the second-level process relative to the first-level process, including that of permanency and ease of access of land records, may be more salient to land administrators than to household beneficiaries.

The results provide information on whether and how the impacts of second-level certification differ across households, which vary on a set of characteristics that are important for policy and programming considerations. Two approaches were used for this. Firstly, standard subgroups analysis was conducted for three binary categories of interest: gender of household head (male vs. female-headed households); widowed status of household head (widows vs non-widows); and program round (ELTAP households vs. ELAP households). Secondly, the study used Local Regression (LOESS) plots to assess how impacts vary across the distribution range for a set of four continuous factors. Understanding whether and how program impacts vary across a set of common and relevant context factors contributes to the knowledge base around more effective programming decisions for future implementation.

⁷ An ex-post disaggregation was also considered to assess Tigray region outcomes separately from the other three regions of ELTAP/ELAP implementation, due to implementation differences in Tigray. This is because implementation of first-level certification in Tigray began several years earlier and was more widely implemented than in the other three regions. In the remaining regions, second-level certification was implemented shortly after or in lieu of first-level certification. Thus, the extent of household exposure to and experience with the first-level process in these regions was likely to be quite different. Moreover, first-level certification in Tigray focused on providing documentation in the name of the household head, while in the other three regions husbands and wives were jointly listed in married households (Deininger et al., 2008). Bezu and Holden (2014) provide additional details regarding the nature of decentralized implementation for first- and second-level certification, and also describe variations across different regions. However, this IE was not designed to identify impacts by individual regions, and unfortunately it does not have a sufficient sample size within each region, hence study power, to conduct a viable sub-group analysis by region. A credible analysis of impacts by region would have required increasing the cluster and household sample size within each region, for both the baseline and the endline data collection efforts.

⁸ Youth-headed households are defined as households where the household head was < 35 years in age.

ROBUSTNESS CHECKS

To examine the robustness of the impact estimates, the study relied on alternative model specifications, particularly across results from the fixed effects DID and the entropy-weighted DID. Additionally, a ‘false discovery rate’ (FDR) adjustment was used, to correct p-values from each test for the fact that multiple tests were run within each outcome family and across subgroups (Benjamini and Hochberg, 2000). Given the number of tests that were run, some portion of the significant results obtained would be expected to be simply due to chance. Put differently, the more tests that are run, the higher the likelihood that some of them will come back significant, but some of these are likely to be false positives. Results that maintained their significance even after the p-values were adjusted via the FDR correction are considered highly robust.

Lastly, a cross-sectional multiple treatment group DID was run that estimated impacts for households with no certification, second-level survey only, and second-level survey and certification, each relative to first-level certification. Those results tend to additionally confirm the small but significant credit, tenure security and female empowerment impacts relative to first-level certification that were obtained via the entropy-weighted fixed effect DID models, while also contextualizing those impacts relative to no certification (See Annex II, Figure 2.2).

The fixed effects DID model with panel data controls for time-invariant unobservable potential confounders, and any aggregated confounding trends that may have been present across all study areas. However, as with any quasi-experimental DID approach, it is possible that there were confounding factors which varied over time, and affected outcomes across the treatment and comparison groups differently. If such time-varying confounding processes are present, they could introduce bias to the impact estimates reported. It is therefore useful to consider the extent to which potential bias arising from time-varying unobservable factors⁹ could plausibly explain the results, as this is a potential pitfall with any DID approach (Rosenbaum, 2010). The research team currently has no indication of a strong presence of such time varying but unobservable factors. If present, in order for such hypothetical confounders to have strongly biased the results reported here, they would need not only to have affected the outcomes differently across the treatment and comparison groups measured in this study, but also to have changed differentially for these two groups during the time period of the evaluation (i.e., large shifts between 2007 and 2015), have occurred prior to the introduction of second-level certification in any given place, and also co-varied with where and when second-level certification was introduced (noting that the timing of second-level certification rollout differed across different areas in the study). If there are such time-varying unobservable factors that are not adequately proxied across the current set of observable household and village context factors on which the entropy-balancing was conducted, then the result of controlling for them more explicitly could be a lower magnitude or reduced statistical significance of outcomes, relative to the current impacts obtained. In that sense, current results could be thought of as an upper bound on actual magnitude of impacts, if such time-varying unobservable and truly confounding factors were present.

⁹ Note that time-invariant confounders and aggregated trends across the study area are already controlled for in the fixed effects DID model.

DEFINING TREATMENT

A number of potential treatment and control groups can be constructed from the baseline and endline evaluation data. This possibility arises because there are two sets of baseline data (conducted separately across ELTAP and ELAP), and because some of the households in the panel did not receive the full second-level certification process at endline (referred to in this report as partial second-level certification). For such households, their land was surveyed; however, they did not receive the certificate of possession from government. Thus, the dataset includes households which remained uncertified across baseline and endline survey waves; went from no certification to first-level; remained at first-level certification throughout; or went from first-level to second-level certification.¹⁰ Excluded from all analyses are 398 households that had already received second-level survey or certification prior to the baseline data collection.

Due to the possibilities for examining different treatments that are presented by this situation, impacts were estimated for the four comparison groups described in Table 3 below.¹¹ To bolster confidence in the comparability of treatment and control households used in the analyses, treatment and control groups were examined for similarity of distributions across key household factors and village context variables, at baseline and endline, for each Treatment definition used. There were few substantive differences on household characteristics (in other words, the means and distributions across the two pools are similar and strongly overlap; see Annex II, Figures 2.4-2.5). Where significant differences were present for key village context covariates in the unweighted sample (for example, on proxies for market access and agricultural potential), they were effectively removed via entropy balancing for nearly all outcome indicators, across the different treatment definitions used (see Annex II, Figures 2.6-2.16). Treatment and control households and woredas were also examined for physical geospatial overlap, for each Treatment definition (see Annex II, Figures 2.17-2.20). This provided additional evidence that treatment and control groups were generally similarly distributed across key locational and context characteristics that could also influence outcomes or skew results.

¹⁰ Furthermore, within this last category, there are households that completed the land survey process but did not receive certificates of possession, and others which were both surveyed and certified.

¹¹ The different treatment vs control comparisons that the evaluation chose to run stems from the complexity around treatment and control categories that can be constructed from the baseline and endline data, given that many surveyed households did not receive a land certificate; and the concern that lumping households too coarsely into treated and control categories could reduce the ability to detect a small treatment effect from second-level certification if it exists. The study also wanted to be able to draw on the full set of households for which data has been collected, where advantageous. The group D analysis enables exploitation of the full dataset, and thus gains power due to the larger number of village clusters and overall sample size therein.

TABLE 3. TREATMENT AND CONTROL DEFINITIONS AND HOUSEHOLD SAMPLE SIZES USED IN THE IMPACT ANALYSES

Comparison Group and Description	Treatment Group	Control Group
A: Full or partial second-level certification relative to first-level certification. Assesses the marginal impact of second-level certification over first-level, for households that were surveyed only, or surveyed and certified, under the second-level (includes households that received only part of the intended second-level process)	(Household N = 884) Households with second-level surveying and second-level certification (survey only, and survey + certified combined)	(Household N = 1,017) Households that have first-level certification only
B: Full second-level certification relative to first-level certification. Assesses the marginal impact of second-level certification over first-level (excludes households that received only part of the intended second-level process)	(Household N = 345) Households that were surveyed and received a certificate of possession under second-level (surveyed and certified households only)	(Household N = 1,017) Households that have first-level certification only
C: Partial second-level certification relative to first-level certification. Assesses the marginal impact of land surveyed under second-level certification over first-level certification	(Household N = 539) Households that had their land surveyed under second-level process, but did not receive a certificate of possession (surveyed households only)	(Household N = 1,017) Households that have first-level certification only
D: Full or partial second-level certification relative to no or first-level certification.	(Household N = 1,844) Households with second-level surveying and second-level certification (survey only, and survey + certified combined)	(Household N = 1,959) Households with no certification or first-level certification

FINDINGS I: OVERVIEW OF KEY RESULTS

KEY FINDINGS

This section presents an overview of the findings on impacts of second-level certification. For readers interested in a more technical discussion of the methods and findings across each outcome family, please refer to the subsequent section of the report. Findings are reported on the basis of the entropy-weighted fixed effects panel DID models that were run for each outcome indicator. These methods more effectively remove the influence of confounding selection biases around the locations and contexts that were prioritized for implementation of the second-level certification process. Full results from both the fixed effects and weighted fixed effects sets of models are presented in Annex III, Table 3.1.

OVERVIEW OF KEY RESULTS

AVERAGE TREATMENT EFFECTS OF SECOND-LEVEL CERTIFICATION ON TREATED HOUSEHOLDS (ATTS)

A table of abstracted results—which shows only the direction of impact and level of significance—is presented in Table 4; this table highlights basic patterns of findings across different outcomes and comparison groups. Full details of the Average Treatment Effect on the Treated (ATT) estimates for all indicators across each outcome family are presented in Table 5 (results are reported for the entropy weighted fixed effects approach). As suggested by Tables 4 and 5, the results suggest significant and positive average impacts of second-level certification relative to first-level certification for indicators from three outcome families:

- **Credit access:** The study finds a 10% additional increase in the likelihood of households in the treatment group taking out any credit for farming purposes, and a small increase in the average amount of credit obtained. The results indicate a small average magnitude of impact, and are robust to different model specifications. This result is encouraging, but should be viewed with caution since land certificates cannot be used as collateral in formal lending situations in Ethiopia, and the mechanism for this impact is not clear from the study data. This result may relate more strongly to household credit activity obtained through an informal lending environment.
- **Tenure security:** The study finds moderate impacts on certain indicators for land tenure security, including an 11% increase in the likelihood of the household believing they have a heritable right to bequeath their land, relative to households with no certification or first-level certification.
- **Female empowerment and involvement in land-related decision-making:** The analysis indicates an 11% increase in the likelihood of a wife possessing land in her name, and a 0.32 hectare increase in land held jointly by husband and wife or by female-headed households, as a result of second-level certification. The evaluation also finds a 44% increase in a wife deciding which crops to grow on land in her possession. The magnitude of these impacts are fairly large, and results are moderately robust.

The study also found some differences in impacts for households receiving partial versus full certification (Treatments B and C), however the analyses generally indicated few substantive differences in impacts across households that received full vs. partial second-level certification relative to first-level certification¹². More detailed descriptions of the significant effects under each outcome family, including subgroup results and heterogeneous effects, are elaborated in the subsequent sections.

Given that the study did not find significant household-level impacts of second-level certification relative to first-level certification for several of the indicators assessed, it is useful to consider the extent to which study power or measurement variability could explain these results. Drawing on power calculations re-run during the endline analyses, which use input parameters drawn from the study data used under each of the different treatment definitions¹³, it is noted that Treatment A is powered to detect fine-grained to medium effects from the program for 16 of the 20 outcome indicators assessed. This corresponds to a 10 to 34% detectable magnitude of change depending on the outcome.

There is slightly lower study power and the magnitude of detectable effect is somewhat higher for the two land rental activity indicators, and the number of parcels and area of land held only by the wife, due to higher response variability around these indicators. For these four indicators, the study is powered to detect magnitudes of change ranging from 38 to 44% under Treatment A. The power calculations at endline therefore indicate that Treatment A is sufficiently powered to detect fairly fine-scale and program-relevant effect sizes if they existed, for nearly all indicators assessed. Thus, low study power is not a likely explanation for null effects on these indicators, although measurement errors or variability across baseline and endline could still contribute to non-significant findings, as is always a possibility for panel studies.

Treatments B and C are also powered to detect a medium to large magnitude of program impact if it exists, however these treatment definitions are somewhat less powered to detect finer-grained effects for some indicators. This is because the total number of clusters (kebeles) is lower under these more restricted definitions of treatment, and this smaller cluster N contributes to lower power to detect fine-grained effects. The study is not powered to detect small-scale program impacts for some indicators, which means that for such outcomes the study is not able to distinguish a small true program impact from no impact. This particularly applies to the two land rental activity indicators, which had lower power across all treatment definitions due to especially high response variability on these indicators.

Here, as for the study in general, the assumption is made that given the relatively large cost to implement second-level certification across the 4 regions assessed, evidence of very small or fine-scale program impacts, while certainly interesting, are less likely to play a strong role in altering program decision-making. That is, although the evaluation is not powered to differentiate between very small impacts and no impacts for some of the outcomes assessed, it is suggested that from a programming perspective, such fine-scale impacts, if they exist, may be likely to be acted on similarly to findings of no impacts given the cost of the program. Depending on the outcome indicator, the evaluation is generally

¹² While the evaluation results suggest few material differences in impacts across these two sets of households, it is highlighted that the study does not conclude from the analyses that surveying alone is sufficient to generate positive tenure security or household economic impacts. Given that such households anticipated receiving the full second-level process and formal documentation, it is not possible to know whether their impacts as measured reflected land and related decisions and beliefs made on the actual level of treatment received, or whether such decisions and beliefs also incorporated the household's legitimate expectation to eventually receive formal documentation of their land rights. It is possible that over time, if these households continue to operate in this legally ambiguous area between first- and second-level certification, their behaviors will change and their perception of tenure security will erode. Such a shift may emerge only over longer time frames.

¹³ Additional details on endline power calculations and study power are discussed in Annex II.

powered to detect effect sizes that are at a scale that is likely to present actionable information for programming (this corresponds to MDES values in the 0.10–0.25 range).

SUBGROUP RESULTS AND HETEROGENEOUS EFFECTS

In addition to the full sample of respondents, the study also analyzed results for male-headed households (MHH) and female-headed households (FHH) separately, as well as for widow and non-widow households and ELTAP vs. ELAP baseline data rounds. The subgroups analysis is focused on key policy relevant groups of interest, as well as groups that might be expected to differentially be affected by second-level treatment. For most outcome families, results indicate few differences in the impact of second-level certification for female-headed households over male-headed households or between widows and non-widows.

However, the sub-group results do suggest that second-level certification results in a significant and substantial improvement for FHH or widow-headed households across some measures of land tenure security and female empowerment. This included an 11% average increase in the likelihood of female-headed households (and a 12% average increase in the likelihood of widows) feeling more secure entering into credit-based business transactions when the transactions occur with a holder of a land certificate (Annex III, Table 3.2). Additionally, results indicate a 44% average increase in wives deciding which crops to grow on land in their possession and an average increase of 0.32 hectares of land that is held jointly by husbands and wives or by female-headed households (Annex III, Table 3.1).

Lastly, it is noted that the differences in effect size between female and male-headed households, and widows compared to non-widow households are statistically significant and large for two of the credit access indicators: obtaining any credit, and the amount of credit taken out for farm improvements, specifically. For both of these indicators, there are positive and significant impacts for both male and female-headed households, although comparisons of impacts by subgroups suggest that the second-level certification treatment enables men to take out credit more than it does women. In other words, there is a positive and statistically significant impact of second-level certification on credit access for female-headed households, however the magnitude of this positive impact from second-level certification is not as large for female-headed households as it is for male-headed households.

The study also examined how impacts of second-level certification relative to first-level certification varied across a set of key policy relevant moderating factors, including household head age, total landholdings, wealth status, and distance from major regional town. Such analyses help to illustrate if and how program impacts vary across a set of common and relevant context factor. In doing so, they contribute to the knowledge base around more effective programming decisions for future implementation—by identifying the range of values for each factor over which program impacts appear to be more or less effective, and highlighting considerations for how programming could be targeted differently to households or areas within or outside this range. For these continuous factors, results suggest the main sources of heterogeneous effects are distance to the regional capital and the size of total landholding by the household. Results also suggest that on the whole, the household's baseline wealth status and the age of household head are less frequently important moderators of treatment effects. More detailed results and accompanying figures are described in the sections below.

Given the different timings of baseline data collection and variations in program implementation for ELTAP relative to ELAP, disaggregated results were also run by program round to test for significant differences in impacts across the two programs (Annex III, Tables 3.5–3.7). The trend and significance of

results within each program largely supports the overall average effects. However, on average the magnitude of impact for ELAP was found to be significantly greater than for ELTAP-treated households for some outcomes. This was particularly for the amount of credit households obtained for farming investments, and for indicators of tenure security improvements (household belief over rights to bequeath land, perceived land redistribution risk, and security over entering into credit transactions with holders of land certificates). However, due to the different timing of the baseline data collection for these two program rounds, it is also possible that the estimated greater magnitude of impacts under ELAP relative to ELTAP are also at least to some extent affected by different time trends that are captured by the 2007-2015 data collection for ELTAP versus the 2012-2015 data collection for ELAP.

**TABLE 4. OVERVIEW OF SIGNIFICANT ATT RESULTS
(SYMBOLS INDICATE SIGN OF EFFECT AND SIGNIFICANCE OF THE ATT
RESULT¹⁴)**

		Treatment A		Treatment B		Treatment C		Treatment D	
		Full or partial 2nd level certification		Full 2nd level (survey & certificate only)		Partial 2nd level (survey only)		Full or Partial 2nd vs no or 1st level	
Outcome Family Label		FE	WFE	FE	WFE	FE	WFE	FE	WFE
Access to credit	Amount of credit taken for farming purposes in past year in Birr	+	+	+	+	+	+	+	+
	Household took any credit for farming purposes in past year (Yes/No)	+	+	+	+	+	+	+	+
	HH formally or informally used land as collateral to obtain credit	-	+	+		-	-	-	-
Land disputes	Average time to resolve a land dispute in months*	-	-	-	-	+	+	-	-
	HH experienced conflicting land claim related to boundaries or encroachment	-	+	-	+	--	+	--	+
Land rental activity	Total area of land the HH rented out, in hectares	+	+	+	+	+	-	--	-
	Total number of plots the HH rented out on a monetary basis	+	-	+	+	+	-	-	-
Soil & water investments	HH invested in any soil or water conservation measures (Yes / No)	-	+	+	-	-	--	-	+
Land tenure security	HH believes it has heritable right to bequeath land (Yes/No)	+	-	+	-	+	+	+	+
	HH believes land redistribution in kebele is likely (Yes/No)	+		+	-	+	-	+	+
	HH feels more secure in credit-based business transactions w/ land certificate holder (4 point likeart)	-		+	+	-	-	+	+
	HH believes land certificate program will have positive impact on land investment	+	+	+	+	-	-	-	-
Female empowerment & decision-making over land	Wife possesses land in her name (Yes / No)	+	-	-	-	+	+	+	+
	Wife has certificate of title for land in her possession	-	-	-	-	-	+	+	+
	Wife decides what crops to grow on land in her possession	-	+	-	+	-	-	-	-
	Wife can rent out land in her possession at her discretion	+	+	+	+	-	+	-	+
	Number of parcels possessed by wife only, or husband and wife jointly	-	--	+	+	-	-	-	-
	Number of parcels possessed by wife only	--	-	+	+	-	-	-	-
	Area of land in hectares possessed by wife only, or husband and wife jointly	+	+	+	+	+	+	+	+
	Are of land in hectares possessed by wife only	+	+	+	+	-	--	-	-

*Note that for this variables, a negative effect sign (-) means the time to resolve land disputes was reduced (this is a positive program impact).

Significance reported as: +/- : $\alpha < 0.10$; +/- : $\alpha < 0.05$; and +/- : $\alpha < 0.01$

FE= Fixed effects difference-in-difference; WFE= entropy-weighted fixed effects difference-in-difference

Results considered highly robust; retains significance even after adjusting p-values for multiple hypothesis testing via a FDR approach

¹⁴ Results in the dark shaded cells are considered robust—they stand up to alternative model specifications, and also maintain significance after correcting p-values for false discovery.

TABLE 5. AVERAGE TREATMENT EFFECTS ON THE TREATED (ATTS) BY OUTCOME FAMILY¹⁵

Outcome Family	Label	Treatment A	Treatment B	Treatment C	Treatment D
		Full or partial 2nd level	(survey & certificate only)	Partial 2nd level (survey only)	2nd vs no or 1st level
Access to credit	Amount of credit taken for farming purposes in past year in Birr	0.72** (0.338)	NS	0.92** (0.408)	0.89*** (0.238)
	Household took any credit for farming purposes in past year (Yes/No)	0.10** (0.047)	NS	0.13** (0.057)	0.13*** (0.036)
	HH formally or informally used land as collateral to obtain credit	-0.13*** (0.048)	NS	-0.19** (0.091)	-0.06* (0.0345)
		NS	NS	NS	NS
Land disputes	Average time to resolve a land dispute in months ^a	NS	NS	NS	NS
	HH experienced conflicting land claim related to boundaries or encroachment	NS	NS	NS	NS
Land rental activity	Total area of land the HH rented out, in hectares	NS	NS	NS	NS
	Total number of plots the HH rented out on a monetary basis	NS	NS	NS	NS
Soil & water investments	HH invested in any soil or water conservation measures (Yes/No)	NS	NS	NS	NS
Land tenure security	HH believes it has heritable right to bequeath land (Yes/No)	NS	NS	NS	0.11** (0.049)
	HH believes land redistribution in kebele is likely (Yes/No)	NS	NS	NS	NS
	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes/No)	NS	0.10* (0.056)	NS	0.07** (0.031)
	HH believes land certificate program will have positive impact on land investment	NS	NS	NS	-0.13*** (0.050)
		NS	NS	NS	0.11** (0.054)
Female empowerment & decision-making over land	Wife possesses land in her name (Yes/No)	-0.21*** (0.063)	-0.20*** (0.076)	NS	NS
	Wife decides what crops to grow on land in her possession	0.44** (0.108)	0.48*** (0.146)	-0.34* (0.193)	NS
	Wife can rent out land in her possession at her discretion	NS	NS	NS	NS
	Number of parcels possessed by wife only, or husband and wife jointly	NS	NS	NS	NS
	Number of parcels possessed by wife only	NS	0.02* (0.131)	NS	NS
	Area of land in hectares possessed by wife only, or husband and wife jointly	NS	0.32* (0.194)	NS	NS
	Area of land in hectares possessed by wife only	NS	NS	NS	NS
		NS	NS	NS	NS

^a Note that for this variable, a negative effect sign (-) means the time to resolve land disputes was reduced (this is a positive program impact).

Reported results are based on impact estimates obtained via an entropy-weighted fixed effects difference-in-difference model.

Significance reported as: * $\alpha < 0.10$; ** $\alpha < 0.05$; and *** $\alpha < 0.01$.

BOLD results retain their significance even after using a conservative false discovery rate approach to correct p-values for multiple hypothesis testing.

NS = Not statistically significant; impact estimate not shown.

¹⁵ For ease of interpretation, this table does not include coefficients and SEs for non-significant results. Please see Tables 3.1–3.7 in Annex III for full details on estimates and SEs across all outcomes and treatment definitions.

FINDINGS II: DETAILED IMPACTS OF SECOND-LEVEL CERTIFICATION

OUTCOME FAMILIES

This section elaborates on the methods and econometrics used in the evaluation. It provides a more detailed technical discussion for each of the six outcome families.

OUTCOME FAMILY I: ACCESS TO CREDIT

Hypothesis: Having a second-level land certificate increases household access to credit (i.e., micro-finance)

Overall, the results under this outcome family provide strong evidence that second-level certification increases access to credit, across all of the indicators that were tested: (1) the amount of credit the household took out for farming purposes in the past cropping year in Ethiopian Birrs; (2) whether or not the household took out any credit for farming purposes in the past cropping year; and (3) whether the household formally or informally used land as collateral to obtain credit.

For the *amount of credit taken for farming purposes during the past crop year*, results indicate positive and statistically significant impacts from the second-level process for three of the four comparisons groups. The exception is the full second-level certification households (Treatment B; where the study also has lower power to detect effects due to the smaller sample of treated households in this group). The differential effect of the second-level process on treated households ranged from 0.72–0.92 logged-Birrs of credit taken out for farming. The largest impact relative to first-level certification was for the partial second-level certification, or households whose land had been surveyed in the second-level process, but did not receive a certificate of possession (Treatment C). Substantively, the median of all respondents in this group did not take any credit out for farming purposes. Holding other variables constant, the differential treatment effect at the median on households whose land was surveyed during the second-level process is 1.51 Birrs. Given that most households did not take any credit out for farming purposes, either at baseline or endline, this is a small but meaningful increase.¹⁶ Factoring in household fixed effects, households that received second-level surveying but not certification had obtained 134 Birrs in credit at endline, on average, compared to 68 Birrs in credit at endline for the control group. In terms of households in this group who already were taking out credit for farming at baseline, a household at the 90th percentile of credit taken at baseline, which is 1,000 Birrs, takes an estimated 2,490 Birrs of credit for farming purposes as a result of being treated with second-level land surveying (or, an increase of 1,490 Birrs over the mean baseline amount of credit such households generally take

¹⁶ This variable was logged because of its highly dispersed distribution, with many households at 0, but also a long right-hand tail of households taking credit. To avoid negative numbers, '1' was added inside the argument of the log. To provide an example at the median: $\text{Log}(x+1)=B \rightarrow x+1=e^B$, so $x=(e^B)-1$. The actual birrs obtained for a given household is this amount plus $e^{\text{coefficient on household fixed effects}}$.

in the absence of second-level land surveying). These findings of a significant impact of second-level certification on the amount of credit taken are similar when the credit obtained is adjusted for the total hectares of land used by the household. This lends additional confidence that these results are not driven by outlier households, such as large landholders taking out substantial amounts of new credit, and further supports the robustness of the results.

In terms of sub-group results, the amount of credit taken is not statistically significant for female-headed households, though it is for male-headed households for both partial second-level certification relative to first-level (Treatment C) and for Treatment D. The amount of credit taken is weakly significant for widow-headed households who received partial second-level certification (Treatment C). However, the size and direction of the effect is not consistent with the results for the remaining treatment definitions, so the robustness of this result is less certain. For the amount of credit taken, widows and female-headed households see a significantly smaller treatment effect than non-widows and male-headed households, although the real magnitude of difference in credit obtained is very small. This trend holds across all of the treatment definitions assessed. To provide a substantive example of the difference, the average estimated effect size on taking out credit for farming is 0.22 for female-headed households, while it is 0.86 for male-headed households, for households that received either the full or partial second-level process relative to first-level certification (Treatment A). This is equivalent to a difference at the median between 0.24 and 1.35 Birr of credit taken.

As with credit amount, impact estimates of second-level certification on *the likelihood that a household takes any credit out for farming purposes* were positive and statistically significant for all treatment definitions except for Treatment B (households that received full second-level certification), where there are fewer households in the sample and as a result reduced power to detect significant impacts even if they are present. The largest estimated impact on the likelihood of a household taking out any credit for farming purposes was for households that received the partial second-level certification process (Treatment C). Substantively, the differential effect of second-level certification on treated households is a 10 or 13% increase in the likelihood of the household taking out any credit for farming purposes, for Treatment A or C respectively.

Whether or not credit is taken for farming purposes is not statistically significant for female-headed households. It is weakly significant for widow-headed households for partial second-level certification relative to first-level (Treatment C), with an 18% increase in likelihood of taking credit. However, the size and direction of this effect for widows relative to non-widows is not consistent across other treatment definitions, thus the robustness of this result is less certain. Moreover, as with the previous credit indicator, widows and female-headed households also see a significantly smaller treatment effect on the likelihood of taking credit compared to non-widow and male-headed households. To provide a substantive example of the difference, the average estimated effect size on the likelihood of taking of credit for households that received either the full or partial second-level process relative to first-level certification (Treatment A) is 0.02 for FHH while it is 0.12 for MHH. In other words, for female-headed households, there was a 2% increase in the likelihood of taking credit for farming purposes as a result of second-level certification, relative to a 12% increase in the likelihood of taking this kind of credit for male-headed households. Thus, there is a positive and statistically significant impact of second-level certification on credit access for female-headed households, however the magnitude of this positive impact from second-level certification is not as large for female-headed households as it is for male-headed households.

In terms of impacts on second-level certification on whether the *household formally or informally used land as collateral to obtain credit*, these results are negative and strongly statistically significant for households receiving full or partial second-level certification relative to those with first-level certification (Treatment A) and households with partial second-level certification only (Treatment C), and weakly statistically significant for households receiving any second-level certification process relative to households with no certification or only first-level (Treatment D). Substantively, results are that the differential effect of second-level certification on treated households is a decrease in the likelihood of taking credit using land as collateral of 6-19%, depending on treatment definition. As with other results under this outcome family, the largest effect is for households receiving partial second-level certification (Treatment C; land is surveyed, but no certificate of possession is provided). The direction of impact found for this indicator is puzzling, however it is also noted that this indicator was only available for the ELAP data, and that in general most households in the data did not take any credit at all, either at baseline or endline. It is possible that the unexpected direction of results for this partial treatment group could be driven by program-specific or correlated context factors for the ELAP program, while the smaller sample size also renders the impact estimates more susceptible to uncertainty and variability due to measurement errors across baseline and endline. Thus, caution is suggested around the weight that is given to these credit outcome results. Sub-groups analysis for female-headed households and widows was not conducted for this indicator, as the number of observations was not sufficient.

OUTCOME FAMILY 2: IMPACTS ON LAND-RELATED DISPUTES

Hypothesis: Second-level-land certification reduces the number of land-related disputes households face, and households with second-level land certificates require less time to resolve land-related disputes when they arise.

The results under this outcome family provide little to weak evidence that second-level certification had any additional substantive impacts on land dispute activity over first-level certification across the indicators tested: (1) the average time in months it took for households to obtain resolution on any land disputes they experienced; and (2) whether the household experienced a conflicting land claim related to parcel boundaries or encroachment.

Results for the *average time to resolve land disputes* were generally negative but not statistically significant. This provides a weak suggestion that second-level certification processes may shorten time to resolve disputes. It is also noted that land disputes were relatively uncommon in the data, which increases the difficulty in obtaining statistically significant results. Sub-groups analysis for female-headed households and widows was not conducted for this indicator, as the number of observations was not sufficient.

For whether a *household experienced conflicting land claims related to parcel boundaries or encroachment* specifically, results overall are small, weak, and inconsistent in terms of impacts that can be attributed to second-level certification processes. Again, it is noted that disputes were rare overall (see Annex III, Tables 3.29-3.37), which makes it difficult to detect patterns in the data.

In terms of sub-groups analyses, there is weak evidence that the effect on boundary disputes or encroachment of the full second-level certification (Treatment B) is smaller for female-headed than male-headed households. There is also weak evidence that second-level certification increases the likelihood of a household experiencing conflicting land claims for female-headed households and widows. For female-headed households, the likelihood increases by 6%, and for widows the likelihood increases by 10%, when comparing full or partial second-level certification to no or first-level certification (Treatment D).

OUTCOME FAMILY 3: IMPACTS ON LAND RENTAL ACTIVITY

Hypothesis 3: Having a second-level land certificate increases the likelihood households engage in land rental and sharecropping activities

The study does not find evidence for additional impacts of second-level certification relative to first-level certification on land rental activity across the indicators tested: (1) the total area of land rented out by the household, in hectares; and (2) the number of plots rented out on a monetary basis.

The *total area of land rented out* is positive and substantively significant for most treatments, but the effect is only weakly statistically significant for the non-weighted fixed effects models (without entropy balancing) for full or partial second-level certification relative to first-level certification (Treatments A and B). The increase in the total area of land rented out is 0.07 and 0.12 hectares respectively. This increase is small but substantively significant since most households in the data do not rent out any hectares of land. The average area of land rented out amongst households that do rent out land is 0.86 hectares for households receiving full or partial second-level certification; thus, the estimated impact represents a 6-14% increase in land area rented out for these households. However, these findings were not supported in the entropy-weighted models, thus they are considered less robust. The study found no significant results for widows or female-headed households separately, although results for these groups are consistently positive across the treatment definitions.

The impact of second-level certification on the *number of plots rented out* by the household on a monetary basis is not significant for any treatment definition that was assessed. Results are fairly inconclusive for this indicator, as they are alternatively positive or negative depending on treatment group. For both the number of rental plots and the total area of land rented out, results are similar when adjusted for the household's total landholdings, indicating that the change in land rental activity does not depend on the size of the household's initial landholding.

OUTCOME FAMILY 4: IMPACTS ON SOIL AND WATER CONSERVATION INVESTMENTS

Hypothesis: Having a second-level land certificate increases the likelihood households invest in soil/water conservation

Effects are weak and small for whether the household increased investment in any soil or water conservation measures as a result of second-level certification relative to any investments already made as a result of first-level certification. However, it is also noted that there were limitations in the quality and resolution of baseline data that served as indicators for these outcomes, which necessitated using binary indicators in the final analyses and likely contributed to a coarser ability for the study to detect finer-scale impacts, if they existed.

OUTCOME FAMILY 5: IMPACTS ON TENURE SECURITY

Hypothesis: Having a second-level land certificate results in stronger perceived tenure security for women and men.

The body of results for impacts of second-level certification on a household's perceived security of tenure over their land is drawn from the following indicators: (1) the respondent's belief that they have a heritable right to bequeath land that they use; (2) belief that redistribution of land is likely to take place in their kebele, within the next 5 years; (3) belief they feel more secure to enter into any sort of business transaction involving credit when it is with a farmer who has a Certificate of Possession over

his or her land; and (4) belief that the land certificate program implemented in their kebele will have a positive impact on investment on land. Overall, the results suggest some clear indicators of tenure security improvements as a result of second-level certification, particularly for female-headed households and widows.

For second-level certification impacts on household belief that they have a heritable right to bequeath their land, results were statistically significant for full or partial second-level certification relative to no or first-level certification (Treatment D) and indicated an 11% increase in the likelihood of the household believing they have the right to bequeath their land as a result of second-level certification. Results were also positive, but not significant, for partial second-level certification relative to first-level certification (Treatment C). The study did not find strong evidence of a different impact on this indicator of tenure security for widows relative to others. Results do suggest a significant difference in second-level certification impacts on this measure of tenure security as experienced by female relative to male-headed households. Impacts are positive for both sub-groups, but results from the fixed effect model suggest that male-headed households may have a larger impact from any second-level certification process relative to no or first-level certification (Treatment D) for this measure of perceived tenure security. The differential effect of treatment for female-headed households is an 8% increase in the likelihood of the respondent believing they have the right to bequeath their land, compared to around 14% for male-headed households. However, this difference narrows in the entropy-weighted models, thus should be interpreted with caution.

For impacts on household belief that redistribution of land is likely to take place in their kebele within the next 5 years, there is little conclusive evidence of impacts from second-level certification on this measure of tenure security. Results are negative, but the effect size is small and not significant for Treatments A, B and C. Results are positive, small, and not significant for full or partial second-level certification relative to no or first-level certification (Treatment D). Note that for this indicator, a negative estimate means the household believes that land redistribution in their kebele is less likely.

The results show somewhat stronger evidence of impacts on household belief they feel more secure to enter into any sort of business transaction involving credit when it is with a farmer who has a Certificate of Possession over his or her land. The estimate for this is weakly statistically significant and positive for full second-level certification relative to first-level certification (Treatment B), and moderately significant for full or partial second-level certification relative to no or first-level certification (Treatment D). Note that for this indicator, a positive estimate means the household believes more strongly that business transactions involving credit that they might engage in are more secure when done with a farmer who has a certificate of possession for his land.

Results also suggest that second-level certification may have made female-headed households and widows feel more secure than they were at baseline, according to this indicator. This evidence is especially strong for widows. For female-headed households, there is a 24% increase in the likelihood of feeling more secure when such transactions occur with someone who has a Certificate of Possession (Treatment B; full second-level certification relative to first-level certification only). Similarly, an 11% increase was found for female-headed households across all other treatment comparisons except for the partial second-level certification group relative to female-headed households with first-level only. For widows, results similarly suggest there was a 12 to 20% increase in the likelihood of widows feeling more secure when such transactions occur with someone holding a Certificate of Possession, for widows in all treatment groups (A, B and D), except those with partial second-level certification only relative to widows with first-level only.

For impacts of second-level certification on household belief that the land certificate program implemented in their kebele will have a positive impact on investment on land, results for this indicator were small and inconsistently positive for most treatment definitions, but large, negative and statistically significant for any second-level process relative to no or first-level certification (Treatment D). The overall sample size available for this indicator was generally small, thus there is lower power to detect significant impacts even if they are present. Sub-groups analyses for female-headed households and widows were not conducted for this indicator, as the number of observations was not sufficient.

OUTCOME FAMILY 6: IMPACTS ON FEMALE INVOLVEMENT IN LAND DECISIONS AND FEMALE EMPOWERMENT

Hypothesis: Second-level land certification increases women's involvement in land management and decision-making activities

Lastly, results across a series of indicators on female empowerment around land issues suggest modest but important improvements as a result of second-level certification. These results are drawn from the following indicators: (1) whether the wife possesses any land in her name; (2) whether the wife has a certificate of title for land in her possession; (3) whether the wife decides which crops to grow on land in her possession; (4) whether the wife can rent out land in her possession at her own discretion; (5) the number of land parcels in the household possessed either by the wife only, or the husband and wife jointly; (6) the number of parcels possessed solely by the wife; (7) the area of land possessed either by the wife only, or the husband and wife jointly; and (8) the area of land possessed by the wife only. Given the large number of indicators under this outcome family, reporting focuses only on the most significant results here (full results under this outcome family are reported in Annex III, Table 3.1).

Results indicate a fairly large and statistically significant 44 or 48% increase in whether the wife decides which crops to grow on land in her possession, for full second-level certification households alone, or the full and partial second-level households together relative to first-level certification. There is also a positive and statistically significant increase in the total area of land possessed by the wife, jointly with husband, or for female-headed households, for households which completed the full second-level process relative to first-level certification (Treatment B). The estimated average impact is a 0.32 hectare increase in land held jointly or by female-headed households. This is substantively significant given that for households in this treatment group the average number of hectares owned at baseline was 0.24 hectares.

Lastly, it is noted that the ELTAP/ELAP program advocated for joint ownership and both the husband and wife's name to be included on certificates of possession, in married households. Given this programming emphasis towards joint titling and listing of both spouses, it may not be surprising that some of the results indicate a decrease in whether a household has wife-only held land or possession of a certificate of title only in the wife's name, for second-level certification relative to first-level certification. Consistent with this, the indicators which look at joint land possession do show a positive and significant increase, particularly for households that completed the fully second-level process (Treatment B; land surveyed and receipt of a certificate of possession). Moreover, and despite the focus on joint titling, the results of second-level impacts relative to no or first-level certification together suggest a statistically significant net 11% increase in whether a wife possesses land in her name.

MULTIPLE HYPOTHESES TESTS AND P-VALUE ADJUSTMENT

The study uses a conservative ‘false discovery rate’ (FDR) adjustment, to correct p-values from each test for the fact that multiple tests were run within each outcome family and across subgroups. Given the number of tests that were run, some portion of the significant results that were obtained are expected to be simply due to chance (i.e., the more tests that are run, the higher the likelihood that some of them will come back significant). Some of the results discussed above do not retain their significance after this correction for multiple comparison testing is implemented. However, it is also noted that implementing such corrections for multiple testing, while highly rigorous, is not currently widely done in the program evaluation literature. It is noted that most of the credit risk variables and some of the key female empowerment indicators retain their significance even after this conservative adjustment is implemented. This is especially so for whether credit is obtained, the amount of credit obtained for farming improvements, and the increase in wife-reported decision-making around crops grown on land in her possession. This provides additional evidence for the robustness of the credit risk and female empowerment findings.

TIME TREND NOTES

In many cases, the coefficient on the time dummy variable in the DID models is positive and statistically significant, indicating that there is a general positive trend over time in the outcome variable that is independent of treatment effects. However, the time dummy is negative for the credit indicators, indicating a general downward trend in access to credit over time for households in the study area. This is a background trend that is independent of treatment and further suggests that second-level certification is having a positive impact on credit risk outcomes (in other words, the sign of the time estimate suggests a general declining trend in the ability of households to access credit, while households with second-level certification are able to maintain some level of access, albeit of small magnitude, despite the overall decline in credit access).

MULTI-ARM TREATMENT ANALYSES

Given that the dataset for this impact evaluation contains households that either remained uncertified, transitioned from no to first-level certification, remained at first-level throughout, or transitioned to second-level certification, a cross-sectional difference-in-difference model with multiple treatment groups and a set of time-varying household-level controls (these were: household total landholding, family size, and maximum level of educational attainment) was also run to obtain straightforward estimates of the comparative impact of each increasing level of certification that is represented in the data. These results largely confirm the findings discussed above and serve as an additional robustness check on the analyses. In particular, the results reinforce that increasing levels of certification appears to improve a household’s access to credit and the amount of credit obtained for farming, as well as some of the indicators for tenure security. Full comparisons of impact estimates across all certification treatment levels are presented in Annex II, Figure 2.2.

In terms of the impacts of partial second-level certification (land is surveyed but certificate is not received) over first-level certification, the results based on a multiple treatment group approach suggest the following impacts are attributable to second-level land surveying:

- A 0.95 logged-Birr increase in the amount of credit obtained by a households for farming;
- A 3.9% increase in the likelihood that a household takes any credit for farming purposes;

- A 13% increase in the likelihood that a household believes it has a heritable right to bequeath land;
- A 9% increase in whether a wife has land in her name.

For the impacts of full second-level certification (land is surveyed and certificate is received) over first-level certification, the results suggest the following impacts are attributable to second-level land certification:

- A 0.66 logged-Birr increase in the amount of credit obtained by a households for farming;
- A 9.4% increase in the likelihood that a household takes any credit for farming purposes;
- A 10.4% increase in household belief that business transactions involving credit in which they might engage are more secure when done with a farmer who has a certificate of possession for his or her land.

HETEROGENEOUS EFFECTS ACROSS KEY MODERATING VARIABLES

To examine heterogeneity, the study used a form of a LOESS graph of the estimated effect of treatment using a difference-in-difference estimator without controls. The plots enable observation of how second-level certification treatment impacts change across values of a key moderating variable. The shape of the line, and whether the confidence interval crosses zero or not, informs as to whether there is evidence of non-linear or heterogeneous effects across different values of the moderating factor. It also guides the pursuit of additional significance testing of different treatment effects within the sub-group.

For example, in Figure 1 below, the x-axis shows the age of the household head, and the y-axis shows the estimated effect of second-level surveying or full certification (Treatment A) on the number of plots rented out. Point estimates and a 95% confidence interval are shown at each value of household head age. The solid black line in each chart represents the impact estimate, or the differential effect of second-level certification treatment on households which received this treatment. The expected null is that this impact will be zero. Where the solid line and the confidence interval around it do not include zero, this indicates a likely impact of second-level certification on the y-axis outcome indicator (which is statistically significantly different from zero) at the given x-axis value of the moderating value¹⁷.

A series of charts for key outcome families are included below, which illustrate if and how second-level certification treatment effects vary for key outcome indicators across a set of key moderating factors: household distance from regional town, total landholding, wealth status¹⁸, and age of household head. Overall, the main sources of heterogeneous effects which emerge from this analysis are for distance to the regional capital and the size of total landholding by the household. The results also suggest that on the whole, the household's baseline wealth status and the age of household head are less frequently important moderators of treatment effects.

¹⁷ In some cases there are negative numbers along the x-axis, due to using logged values.

¹⁸ The wealth index is constructed from baseline household assets, total landholdings and roof construction (livestock data are dropped from the index construction, due to a lack of confidence in the livestock baseline data and much missing data at baseline across key livestock categories).

HETEROGENEOUS EFFECTS RELATED TO ACCESSING CREDIT

FIGURE 1: HETEROGENEOUS TREATMENT EFFECTS ON AMOUNT OF CREDIT, BY DISTANCE TO NEAREST REGIONAL (KILLIL) CAPITAL

Households receiving second-level certification were more likely to take credit for farming purposes over the past year. This relationship increases as the distance to the regional capital increases, until kebeles located around 300 kilometers from the regional capital. Beyond roughly 300 kilometers from regional capital, the effect size for households in kebeles that are further away diminishes and becomes indistinguishable from zero. The results indicate that second-level certification may be less effective in increasing credit uptake among households in more remote areas. Note that credit amount here is not logged, so the chart can be interpreted as suggesting that second-level certification has an estimated average effect of increasing the amount of credit obtained for farming purposes by an amount in the range of 100-600 birrs, for households that are located 200 kms from the regional capital.

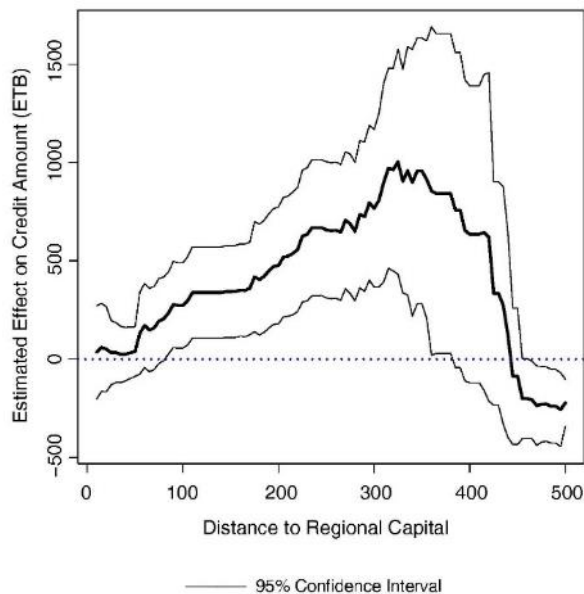


FIGURE 2: HETEROGENEOUS TREATMENT EFFECTS ON AMOUNT OF CREDIT, BY HOUSEHOLD LANDHOLDING AND DISTANCE TO REGIONAL CAPITAL

Figure 2 shows how the impacts of second-level certification on the amount of credit obtained, and the likelihood of a household taking any credit for farming purposes, vary by a household's total landholding the household distance to the regional capital. Households receiving second-level certification were more likely to take credit for farming purposes, and this effect is fairly constant over log amount of land. The upper and lower right charts in this figure indicate some suggestion that both of the credit effects (that is, the amount of credit obtained, and the likelihood of taking any credit) may decline for households with larger landholdings, but further study and larger household sample size at this end of the landholding spectrum would be required to confirm this. Note that for the upper left chart, both the credit amount obtained and amount of land here are logged, thus the resulting graph can be interpreted in a linear fashion. The lower left chart indicates a fairly constant average impact of second-level certification on the likelihood of a household obtaining any credit for farming purposes, across households in kebeles located within 300 Km of the regional capital, beyond which impacts are more variable.

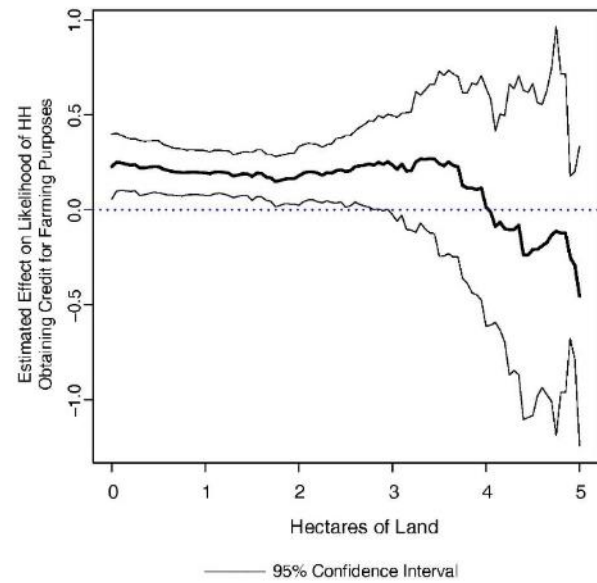
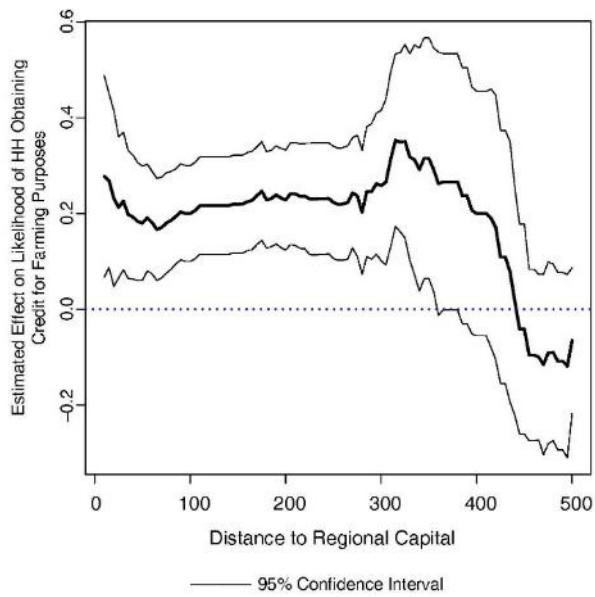
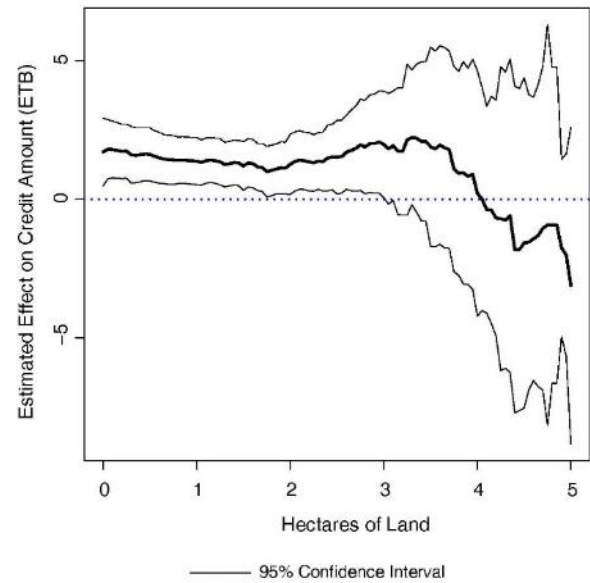
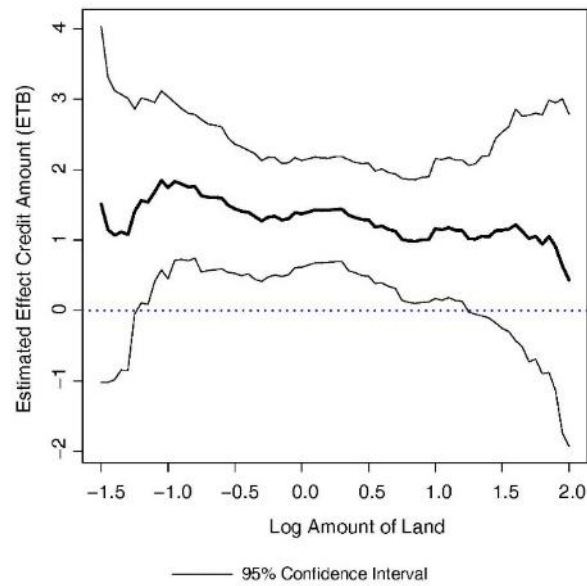


FIGURE 3: HETEROGENEOUS TREATMENTS EFFECTS ON LIKELIHOOD OF HOUSEHOLD OBTAINING CREDIT, BY AGE OF HOUSEHOLD HEAD AND HOUSEHOLD WEALTH STATUS

The effects of second-level certification on the likelihood of a household obtaining credit, for distance to the regional capital, log amount of land and age all showed fairly constant evidence that the likelihood of taking credit out for farming purposes increases by 20% for the treatment on treated households for all but extreme contexts—such as households that are the furthest distances from the regional capital and that have the largest amount of total landholdings. As indicated below, results remain fairly constant across households with younger and older household heads, and the evidence does not suggest differential treatment impacts by household wealth status.

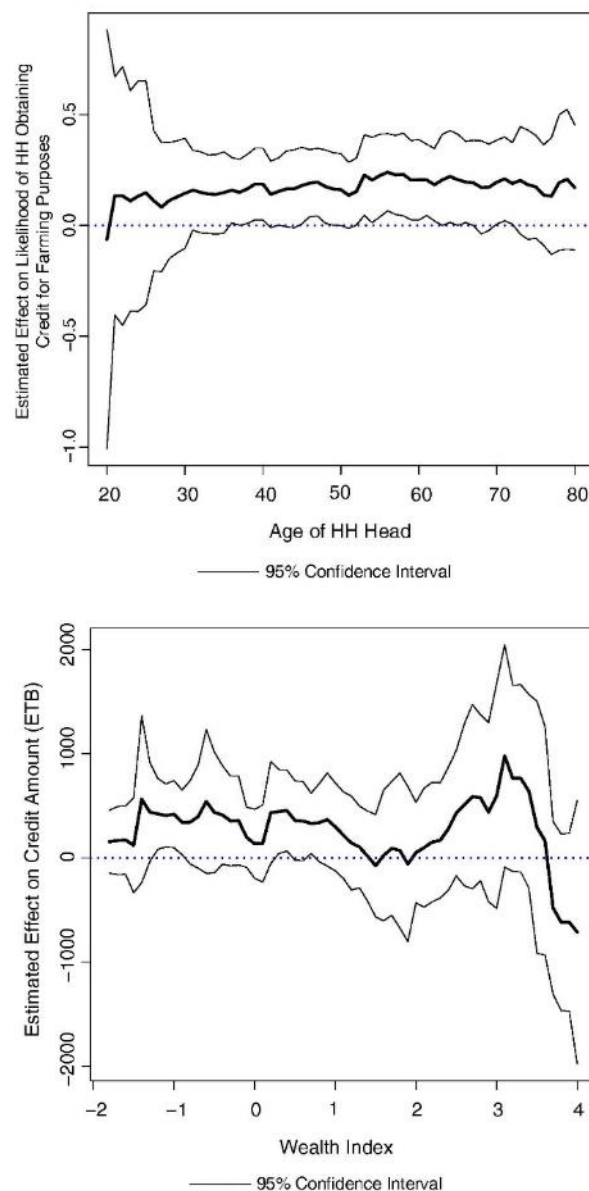


FIGURE 4: HETEROGENEOUS TREATMENT EFFECTS ON TENURE SECURITY

The effect of second-level certification on whether a household feels more secure entering into a credit-based business transaction when it is with someone who holds a land certificate increases at closer distance to nearest regional capital (upper left plot) and at intermediate values for total household landholding (lower left plot). There is also weak evidence of an effect of second-level certification on security of business transactions involving credit at lower levels of the logged wealth index and for household heads aged around 35-50 years old.

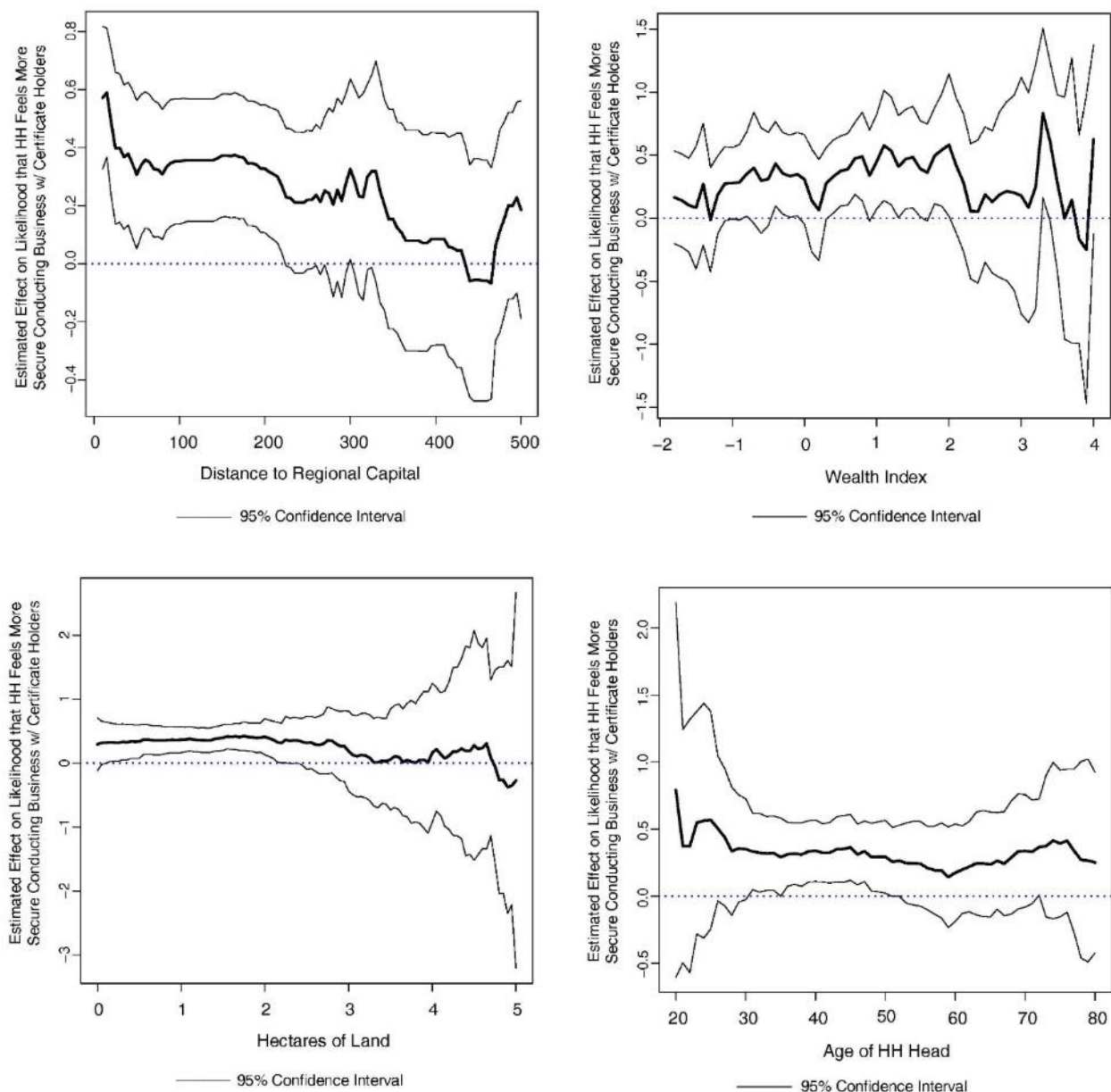
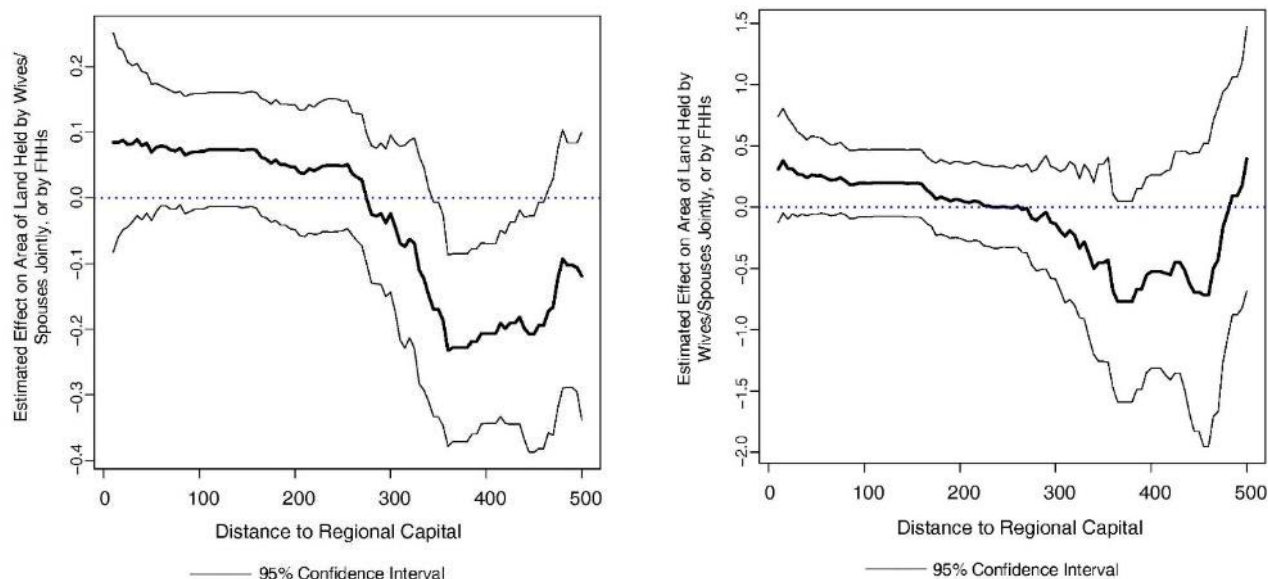


FIGURE 5: HETEROGENEOUS TREATMENT EFFECTS ON FEMALE DECISION-MAKING AND EMPOWERMENT

As indicated by the charts below, there is weak evidence that the positive average impacts of second-level certification on the land area held by female-headed households and wives alone (left-hand chart), or combined with land held by husbands and wives jointly (right-hand chart), is not maintained for households in villages that are more isolated from regional capitals. The charts indicate a decline in impacts and possibly suggest negative impacts on this indicator for households in highly remote kebeles, though more targeted analyses on such households than is possible with the sample size available for this IE would be needed to confirm this.



CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Compared to the change from no certification to first-level certification, second-level certification can be thought of as a more incremental treatment. The effects at the household level may be more nuanced to detect over a shorter time frame. Still, the evaluation results do suggest some small but important additional impacts of the second-level process on households for some development outcomes. Small but significant increases due to second-level certification were found for: credit access, tenure security, and increased involvement of women in land-related decision-making and land possession. For example, relative to impacts under first-level certification, the evaluation results suggest a 10% additional increase in the likelihood of a household taking out any credit for farming purposes, an 11% increase in the likelihood of a wife possessing land in her name, a 0.32 hectare increase in land held jointly by husband and wife or by female-headed households as a result of second-level certification, and a 44% increase in a wife deciding which crops to grow on land in her possession. The evaluation results also suggest that positive second-level certification impacts on certain credit-related, tenure security and female empowerment outcomes tend to be smaller for households located in more isolated kebeles, and for households with much larger than average landholdings. The study employed robust econometric methods to mitigate the potential confounding effects of selection bias to the extent possible. However, as with all quasi-experimental DID designs, there is a possibility that unmeasured confounders may have been present and affected the treatment and comparison groups differently over the time frame of the evaluation. Although the evaluation team has no indication of the presence of such potential confounding factors, if present they could result in biased estimates of program impacts.

The approach for this impact analysis was guided by a focus on more immediate impacts at the household level, across key development outcomes that might be expected from second-level certification relative to first-level certification at the time of endline sampling. From implementation and programming perspectives, the expectation was that second-level certification would further strengthen household security over their landholdings and related impacts, due to technological improvements of the second-level certification process. This included benefits which might accrue because the spatial boundaries of household land parcels are delineated more exactly, and because the computerized second-level process facilitates maintaining permanent records and legacies of ownership that were not possible with the paper-based system of the first-level process (Bezu and Holden, 2014).

However, and given the results of this evaluation, it is also possible that from the household perspective, these additional benefits of second-level certification may become apparent only after a longer time period, or perhaps have strong impacts only for particular kinds of households. For example, households in a particular risk category for land expropriation, or who are faced with a particular situation for which the added-value of these second-level benefits are more directly relevant. Possibilities might include inheritance challenges, or issues related to land transfers, such as in cases of

divorce or the death of a household head or spouse. In terms of the potential for negative impacts to arise from second-level certification, it is noted that some researchers have suggested households could become concerned that land registration might increase their tax burden, and related concerns stemming from the amount of information on the process and purpose of certification that a household received (Bezu and Holden, 2014).

Lastly, it is highlighted that the ELTAP and ELAP programs were designed to provide land administration benefits that extend beyond the household level, for example in terms of support to the land registration and record-keeping process that contributes to the overall long-term sustainability of Ethiopia's land administration system. However, this evaluation was designed to consider only the household-level impacts of the program, relative to first-level certification. Therefore, it is important to highlight that this evaluation should not be viewed as a comprehensive evaluation of all aspects of the second-level certification process. Even if the evaluation did not find large additional impacts to households from second-level relative to first-level certification across some of the anticipated household-level benefits, second-level certification may be required to maintain identified benefits of first-level certification. And, there are likely to be broader potential benefits from the program that extend beyond the scope and issues focused on by this evaluation.

CONTRIBUTIONS TO OVERARCHING EVALUATION QUESTIONS

The overarching questions which guided this impact evaluation, and the knowledge obtained on them via the evaluation results, are briefly revisited below.

Q1. WHAT ARE THE MARGINAL WELFARE AND TENURE SECURITY BENEFITS TO HOUSEHOLDS FROM SECOND-LEVEL CERTIFICATION, RELATIVE TO FIRST-LEVEL CERTIFICATION?

Overall, the impact evaluation results suggest that the marginal impacts on household welfare and tenure security from second-level certification relative to first-level certification, at this short term post-implementation stage, are small but significant for certain outcomes and not different from the effects of first-level certification for others. Key improvements over first-level certification were found for measures of household access to credit, in terms of both the likelihood of a household obtaining credit for farming purposes and the amount of credit obtained, although the magnitude of these increases was small. This result is encouraging, but should be viewed with caution since land certificates cannot be used as collateral in formal lending situations in Ethiopia, and the mechanism for this impact is not clear from the study data.

Although this evaluation was not designed to test potential mechanisms for impacts, there is some anecdotal support that the credit results could relate to household credit activity obtained through an informal lending environment, in which land certificates could play a variety of informal roles to help ease the process by which rural farmers obtain credit for farming investments. For example, anecdotal evidence from the ELAP program suggests that second-level certificates have begun to be used either formally or informally within the context of lending by microfinance institutions. An example is the emergence of group-lending arrangements in which the group decides to require members to have and deposit their land certificate with the group as internal assurance against payment defaults by group members (ELAP, 2012). Such a process could also demonstrate stronger creditworthiness to micro-lending organizations, thus potentially raising the likelihood of loan approval or the amount of credit that is approved. There is also anecdotal evidence that microfinance institutions may be using the parcel maps produced through the second-level process to more efficiently verify the amount of farmer

landholdings, which often is tied to the actual amount of credit that the microfinance institution approves (ELAP, 2012). If such changes to microcredit lending practices in conjunction the second-level certification are indeed beginning to occur at scale, in ways which either ease a farmer's ability to obtain credit or the amount of credit obtained, this may be one possible explanation for the small but significant increase in the likelihood of a household obtaining credit and the amount obtained that were found by this study.

This may be especially so, given that the evaluation data indicate that the majority of households surveyed obtain credit from informal lending structures. For example, amongst the households who had obtained credit at endline, the primary sources were microfinance institutions (53% of credit-obtaining households in the study), savings and credit associations (26% of credit-obtaining households), or private individuals (15% of credit-obtaining households), rather than banks. In contrast, the majority of households who had obtained credit at baseline indicated they obtained credit from the government (47% of credit-obtaining households at baseline for ELTAP, and 32% of credit-obtaining households at baseline from ELAP), or savings and credit associations (30% and 48% of credit-obtaining households for ELTAP and ELAP, respectively). However, microfinance institutions was not specified as a separate response category on the baseline survey.

Many studies suggest that improved ease of credit access can be an early but key step in a chain of processes that can facilitate improved household welfare (Atwood 1990; Dercon and Krishnan 1996; Piza and DeMoura, 2015). Thus, while the additional impacts from second-level certification appear to be small, and the evaluation finds little evidence for large overall welfare improvements at this stage post-implementation, it is noted that the apparent contribution towards reducing credit access barriers provided by second-level certification may have potential to facilitate enhanced welfare outcomes over longer periods.

On average, second-level certification also appears to confer a small increase in tenure security across some indicators measured (household increased security entering into a business transaction involving credit with a holder of a land certificate) amongst households that received the full second-level surveying and land certification document. However, this indicator may be considered a less direct measure of tenure security. In terms of the more direct tenure security indicators assessed, the study found no impact of second-level certification on household belief in the likelihood of land redistribution in their kebele, which was generally low across surveyed households regardless of treatment. Or, on household belief that the land certificate program would positively impact land investment, which was quite strongly held across surveyed households regardless of treatment. It should be noted that the evaluation cannot comment on second-level certification impacts on other direct indicators of perceived tenure security such as household belief of retaining control of their land in future, or that land registration would assure this control. This is because several of these planned indicators for tenure security impacts were already very strongly held at baseline by nearly all households in the study, and therefore were not available to use as measures of tenure security change over the evaluation period. Thus, there may have been little potential room for the second-level process to further improve on household-level tenure security gains that may have been achieved relative to first-level certification, at least at this stage of program implementation. It is important to keep this caveat in mind when considering the evaluation results on tenure security.

The evaluation did not find a significant effect from second-level certification on land rental activity or household investment in soil and water conservation measures, relative to first-level certification. It also did not find a significant impact on land disputes, although the overall very low frequency of land

disputes experienced by surveyed households meant that the evaluation was not able to detect small changes in dispute activity if it existed. The evaluation could, however, detect large changes in dispute activity if they existed, and there is no evidence that this occurred as a result of second-level certification. It is noted that the second-level certification is a substantially more expensive process than first-level certification. However, the nature of the documentation would also seem to provide households with expanded legal grounds to defend their land claims, while also facilitating a more permanent and verifiable system for documenting land than was possible under the first-level system. From an administrative perspective, it may be that these enhancements take precedence over cost imbalances, even if current gains relative to first-level certification, from the household perspective, are small.

Q2. HOW, IF AT ALL, HAVE SECOND-LEVEL LAND CERTIFICATES BEEN USED AS PROOF OF OWNERSHIP, AND IS THEIR USE DIFFERENT FROM THAT OF FIRST-LEVEL LAND CERTIFICATES?

This evaluation finds little conclusive evidence for a significant impact of second-level certification on whether a household uses a land certificate as collateral to obtain credit. Because land may not be used as collateral for a formal-sector loan in Ethiopia, this result is perhaps not surprising. At endline, only 4.9% of households (N = 45; ELAP data only) had used their land certificates to secure credit in the past 24 months, a very small increase from the 4.4% of households who had done so at baseline.

Q3. HOW DO BENEFICIARIES PERCEIVE THE VALUE OF SECOND-LEVEL CERTIFICATES RELATIVE TO FIRST-LEVEL CERTIFICATES?

The overall sum of results from this impact evaluation suggests that relative to first-level certification, households are not necessarily making large and different decisions about how they use and benefit from their land as a result of second-level certification, at this stage. On net, this indicates little difference in the perceived value of a second-level certificate relative to a first-level certificate, from the household perspective, at this fairly early post-implementation stage. These evaluation results seem to be consistent with other recent work that has looked at household-level value issues more specifically, also in the context of Ethiopia's second-level certification program. For example, Bezu and Holden (2014) examine household willingness to pay for second-level certificates and conclude that households generally do not view second-level certification to provide substantial additional value over that obtained from first-level certification. However, it may be useful to note again here the preceding discussion on the potential for stronger perceived or actual benefits from second-level certification to accrue to households perhaps only over longer time periods. It is possible that over time, a greater number of households might be exposed to a type of land challenge for which the stronger spatial delineation of household landholding and computerized records of the second-level process might make it easier for a household to assert their land claims (relative to what is possible with the paper-based first-level certificate). Still, it is also possible that these same anticipated strengths of the second-level process could, at least for some households, dampen household security or negatively impact their land-based decisions. This might be particularly if households have uncertainty on the implications of having their land more permanently and precisely recorded, and accessible to a range of potentially unanticipated agencies (Bezu and Holden, 2014).

It is also highlighted that the ELTAP and ELAP programs were designed to provide land administration benefits that extend quite far beyond the household level, for example in terms of support to the land registration and record-keeping process that contribute towards the overall long-term sustainability of

Ethiopia's land administration system. This evaluation was designed to consider only the household-level impacts of the program, relative to first-level certification. Therefore, it is important to highlight that this evaluation should not be viewed as a comprehensive evaluation of all aspects of the second-level certification process. Even if the evaluation did not find large additional impacts to households from second-level certification relative to first-level certification across some of the anticipated household-level benefits, second-level certification may be required to maintain identified benefits of first-level certification, and there are likely to be broader potential administrative benefits from the program that extend beyond the household-level scope and issues focused on by this particular evaluation.

Q4. HOW HAS SECOND-LEVEL CERTIFICATION AFFECTED INTRA-HOUSEHOLD WELFARE DIFFERENTLY FROM FIRST-LEVEL LAND CERTIFICATION?

On the whole, the evaluation results indicate some additional improvements in female empowerment and involvement in land-related issues and decisions for second-level certification over first-level certification. For example, the study found a 44% average increase in wives stating they decide which crops to grow on land in their possession and an average increase of 0.32 hectares of land that is held jointly by husbands and wives (rather than just by husbands) or by female-headed households. These gains were particularly found for households which received full second-level certification, in which household land was surveyed via a participatory process and the household received the updated land certificate. Similar results were not found for households receiving the partial second-level certification process, in which their land was surveyed but a land certificate was not received. Lastly, it is important to note that in married households, the ELAP and ELTAP programs advocated for joint possession of land and the naming of both husband and wife on land certificates. Thus, although the study does not find a significant increase in land holding only by wives in married households, as a result of second-level certification, this is perhaps to be expected since the program focused on promoting joint land possession in such households.

FULL VS. PARTIAL CERTIFICATION

This evaluation was also somewhat uniquely positioned to examine whether and how tenure security and livelihoods impacts differ for households which completed the participatory land survey process relative to those which also received the formal land certificate culminating that process. While the evaluation results suggest few material differences in impacts across these two sets of households, it is not concluded from the analyses that surveying alone is sufficient to generate positive tenure security or household economic impacts. Given that such households intended to receive the full second-level process and formal documentation, the evaluation cannot determine whether their impacts as measured reflected decisions and beliefs made only on the basis of having had their land surveyed, or whether their decisions and beliefs also incorporated the household's expectation to eventually receive formal documentation of their land rights. It is possible that over time, if these households continue to operate in this ambiguous area between first- and second-level certification, their behaviors will change and their perception of tenure security will erode. Such a shift may emerge only over longer time frames.

IMPORTANCE OF CREDIT IMPACTS

Given that barriers around access to credit are believed to be an important constraint for many smallholder farmers in the developing world, this section provides expanded engagement with the evaluation results around credit outcomes. In particular, it draws on the evaluation data to illustrate the informal lending environment in which many of the surveyed households appear to operate, and draws

on available program information to suggest tentative mechanisms that could explain the credit results. With improved access to credit, theory suggests that farmers would borrow to make stronger agricultural investments, such as the purchase of better quality agricultural inputs or equipment, which in turn may enable increased production and crop yields. The means by which land certification may facilitate greater credit access, and agricultural investment by extension, begins by hypothesizing that possession of the land certificate will increase a farmer's tenure security, thus altering farmer risk strategy around land use decisions and his or her likelihood of making longer term or more costly investments on the land. The link from increased tenure security to obtaining more credit for making land investments often focuses on the use of land certificates as collateral to obtain loans (Besley, 1995; Braselle et al., 2002; Deininger et al., 2008). Given that land cannot be used as collateral in Ethiopia, this has been noted to be an unlikely pathway in the Ethiopian context (Bezu and Holden, 2014). However, it is also possible that land certificates or the certification process may induce greater interest among farmers to seek credit, or their likelihood of obtaining loans or higher loan amounts, even in contexts where land cannot be used as collateral. Irrespective of the collateralization aspect, access to credit is generally constrained in rural Ethiopia.

This evaluation found small but positive results of second-level certification relative to first-level certification on household access to credit. It is noted that there is a relatively uncompetitive market for formal credit in the country (foreign banks, for example, are not permitted to operate in Ethiopia). In addition, land may not be used as collateral because it is owned by the state. However, there are several channels for smallholders and others to access credit, including government lending, microfinance institutions, and other less formal or informal lending processes. Some of these channels are more limited than others and can impose significant costs on borrowers. In Ethiopia, credit for agricultural inputs can also be obtained through agricultural cooperatives and peasants' associations. These associations receive that funding from lenders such as the Commercial Bank of Ethiopia. Lenders are closely tied to the government, often to the Ministry of Agriculture (Tadesse, 2014), as the government guarantees the loans. Individuals who borrow are required to repay the loan plus accumulated interest right after harvest. Failure to pay results in loss of other property (livestock, other moveable assets) or a jail term. A recent survey found that while a larger percentage of respondents reported not wanting credit (26.69%), another group reported fear of asset confiscation as a reason not to seek credit (10.29%) (Tadesse, 2014). Furthermore, loan distribution and collection is reported to be "highly political" (Tadesse, 2014). If correct, the politicized nature of lending suggests that alongside other factors (farm size, level of education, off-farm income sources, etc.) prestige within a community may also play a role in determining the likelihood of access to credit.

The evaluation data from this study indicate that the great majority of households surveyed obtain credit from less formal or informal lending structures. For example, amongst the households who had obtained credit at endline, the primary sources were microfinance institutions (53% of credit-obtaining households in the study), savings and credit associations (26% of credit-obtaining households), or private individuals (15% of credit-obtaining households), rather than banks. The majority of households who had obtained credit at baseline indicated they obtained the credit from the government (47% of credit-obtaining households at baseline for ELTAP, and 32% of credit-obtaining households at baseline from ELAP), or savings and credit associations (30% and 48% of credit-obtaining households for ELTAP and ELAP, respectively), although microfinance institutions were not specified as a separate response category on the baseline survey. There was no difference in the proportion by which treated and control households obtained credit across these different institutions at either baseline or endline.

The evaluation finds little evidence for a significant impact of second-level certification on whether a household uses a land certificate as collateral to obtain credit. Because land may not be used as collateral for a formal-sector loan in Ethiopia, this result is perhaps not surprising. At endline, only 4.9% of households (N = 45; ELAP data only) had used their land certificates to secure credit in the past 24 months, a very small increase from 4.4% of households who had done so at baseline. A strong overall downward trend in the proportion of households who took any credit for farming purposes is also noted among households in the study area (as discussed in the findings section, this broader downward trend over time is irrespective of second-level treatment), in which 23% of households reported taking credit out at baseline, while only 7.3% did at endline. Overall, the mean amount of credit taken out was 1.57 logged Birrs at baseline, and 0.50 logged Birrs at endline.

Even if a land certificate cannot legally be used as collateral, in the less formal or informal lending environments which are common in rural Ethiopia it may be the case that second-level land documentation could play a role either in promoting a greater likelihood of a household seeking credit, or as a new form of assurance that some types of creditors may factor into decisions on whether to lend money and in what amount. The evaluation did find a small but statistically significant increase in the likelihood of a household obtaining credit for farming purposes and the amount of credit obtained. These results are encouraging, but should be viewed with caution since land certificates cannot be used as collateral in formal lending situations in Ethiopia, and the mechanism for this impact is not clear from the study data. Nevertheless, the credit impact outcomes were powered to detect fine-scale changes for both of these credit indicators, and these results hold up to multiple econometric specifications and remain statistically significant across each of the different treatment definitions used.

Although the data required to rigorously test potential mechanisms for the credit impacts are not available through this study, there is also some anecdotal support for how such credit impacts might arise, particularly within an informal lending environment. Anecdotal evidence from the ELAP program suggests that second-level certificates have begun to be used either formally or informally within the context of lending by microfinance institutions. An example is the apparent emergence of group-lending arrangements in which the group decides to require members to have and deposit their land certificate with the group, as internal assurance against payment defaults by group members (ELAP, 2012). Such a process could also demonstrate stronger creditworthiness to micro-lending organizations, thus potentially raising the likelihood of loan approval or the amount of credit that is approved. There is also anecdotal evidence that microfinance institutions may be using the parcel maps produced through the second-level process to more efficiently verify the amount of farmer landholdings, which often is tied to the actual amount of credit that the microfinance institution approves (ELAP, 2012). If such changes to microcredit lending practices in conjunction with the second-level certification process are indeed beginning to occur at scale, this may be one possible explanation for the small but statistically significant increases in both the likelihood of a household obtaining credit and the amount of credit obtained as a result of second-level certification that were found by this study.

LAND DISPUTES AND OTHER OUTCOMES

With respect to land disputes, the evaluation also finds little evidence for a strong impact of second-level certification on reducing the level of land conflict, relative to first-level certification. However, it is important to note that the overall frequency of land disputes reported by households was very low at both the baseline and endline survey waves, and distributed across several different types of disputes (that is, disputes were not heavily clustered within certain dispute categories; see Annex III, Tables 3.29-

3.37). Given the low frequency of disputes reported by respondents, this IE therefore had very little power to detect fine scale changes in land dispute activities if they were present. Thus, it is not possible to say definitively that the ELTAP/ELAP second-level certification projects had little or no impact on the scope or scale of land-based conflict in Ethiopia. It is also possible that the first-level registration and land surveying was sufficient to resolve most such conflicts, such that the bulk of improvements on land-related conflicts had already been realized by the time the second-level process took hold. Endline data suggests that overall, the level of land-based conflict has fallen in the four regions, for example from 13% of households having experienced a land dispute at baseline, to 9% of households at endline (though, as the IE results suggest, this general decline in land conflicts cannot be attributed to the second-level certification program). For households that did experience a land dispute, the mean time to dispute resolution was 1.9 months at baseline, and 1.3 months at endline.

In terms of land rental activity, mean area of land rented out by households was 0.12 ha at baseline and 0.21 ha at endline; while the mean number of plots rented out was 0.62 plots at baseline and 0.46 plot at endline. Sixty percent of households had invested in any soil or water conservation measures at baseline, while 75% of households had done so at endline.

In terms of trends in tenure security indicators, 43% of households believed they had a heritable right to bequeath land at baseline, while 96% of held this belief at endline (per the analyses, roughly 11% of this total increase is attributable to the ELTAP/ELAP second-level certification program). The study found no impact of second-level certification on household belief in the likelihood of land redistribution in their kebele, which was relatively low across surveyed households regardless of treatment. Or, on household belief that the land certificate program would positively impact land investment, which was quite strongly held across surveyed households regardless of treatment. However, it should be noted that the evaluation cannot comment on second-level certification impacts on other direct indicators of perceived tenure security, such as household belief of retaining control of their land in future, or that land registration would assure this control. This is because several of these planned indicators for tenure security impacts were already very strongly held at baseline by nearly all households in the study, and therefore were not particularly informative measures of tenure security change over the evaluation period. In this sense, there may have been little potential room for the second-level certification process to strongly improve on household-level tenure security gains that appear to have been achieved after first-level certification, at least at this stage of program implementation. It is important to keep this caveat in mind when considering the evaluation results on tenure security.

For overall trends in female empowerment and involvement in land-related decisions, 26.4% of households reported the wife possessed land in her name at baseline, relative to 97% at endline. On average, households reported 1.68 plots at baseline and 2.54 plots at endline that were possessed either by the wife only or husband and wife jointly. In terms of wife-only held plots, the mean number of wife-held parcels was 0.48 at baseline and 0.65 at endline. The average area of land possessed by the wife only, or husband and wife jointly, was 0.80 hectares at baseline and 1.19 hectares at endline.

FIT WITH EXISTING LITERATURE

In this section the findings from this impact evaluation are briefly contextualized within the existing work on second-level certification impacts in Ethiopia. It is noted that while the literature examining impacts of first-level certification is quite extensive, there are currently few published studies of second-level certification impacts. The studies which do exist tend to focus on different issues than those covered in this evaluation. But, the findings from this impact evaluation are generally consistent with broader

messages from that work, which tends to suggest that the marginal impacts of second-level certification relative to first-level certification are currently small from the perspective of household beneficiaries (for example, see Bezu and Holden, 2014). Other recent work has suggested that the demand for and perceived benefits of second-level certification are likely to vary substantially, and call for greater targeting of the program to areas or households that may be more likely to benefit from the added-value of the second-level process. This has been suggested to include, for example, peri-urban parts of the country where current disputes over land boundaries tend to be higher, or in areas with more recent histories of land redistribution where there may be a greater perception of future expropriation risk (Ghebru et al., 2016). As discussed above, such results could stem from the fairly incremental difference, over the short-term, of the second-level certification process and documentation from the perspective of a household. From a longer term and legal or administrative perspective, however, it seems likely that there may be clear and important benefits of the computerized, more spatially explicit land registration process that occurs under second-level certification—even though the added-value to households, in terms of increased tenure security and related land decisions that might be expected to flow from this, may not have strongly accrued at this early post-implementation stage.

POLICY RECOMMENDATIONS

The findings presented above, based as they are on data that has particular limitations, underscore three cautionary points, which are made here to further contextualize the ensuing four policy recommendations from this impact evaluation:

- While some households experienced positive impacts from partial second-level certification (lands were surveyed but formal certification was not completed) the evaluation does not conclude that surveying, by itself, would be enough, under similar circumstances, to generate positive impacts. It may be that households that were surveyed anticipated receiving formal documentation of rights and made decisions based on these expectations. This may account for some of the results identified. It may be that over time, if these households continue to operate in this legally “grey” area between first- and second-level certification their behaviors will change and their perception of tenure security will erode. It may take several more years to identify this kind of shift.
- The location of land tenure programming mattered in this case. Kebeles that were closer to city centers and markets experienced stronger positive impacts than did more isolated kebeles. This is not surprising given that it is easier to access credit, agricultural inputs, and markets the closer one is to cities. The policy implication of this finding might be that land tenure programming should be targeted to those areas that have easier access to towns and markets due to proximity and/or passable roads or other transport. Areas that are more isolated may, as some research suggests, be “secure enough” to create incentives to invest. However, without access to markets and capital, these incentives will be reduced compared with households that have easier access to credit and needed inputs.
- Digitizing land records may be necessary to support the development of transparent land markets and, eventually, the spread of credit for rural land holders. However, relatively easy access to information may also reduce incentives for households to complete registration processes. If the costs associated with land taxes or otherwise making household information public outweigh the perceived benefits, then some households may be expected to forgo this activity. It is not clear from the data if this is an issue in the ELTAP/ELAP program areas.

Overall, the impact evaluation findings provide a basis for the following four policy recommendations:

1. While second-level certification does seem to increase access to credit, particularly for male-headed households, very few surveyed households obtained any credit for farming purposes. This is not surprising given that a) land may not formally be used as collateral for lending in Ethiopia (though leasehold rights may be used as collateral for lending) and b) commercial lending to small enterprises in Ethiopia is extremely limited. In order to address concerns related to improving access to credit in an environment where land certificates may not be used for secured lending, **policy makers may wish to include a land tenure activity in agribusiness support projects such as [USAID's Agricultural Growth Program-Agribusiness and Market Development \(AGP-AMDe\) effort](#), which is working to increase lending to farmers' organizations in Ethiopia.** Tying land tenure programming more directly to agribusiness and market development projects may have a mutually reinforcing positive impact, given that such projects often aim to increase credit access and land investment, and establish farmer cooperatives and women's involvement in them. Linked land tenure programming could include efforts to strengthen knowledge on land rights, women's rights to land, and the different ways that land certificates might informally aid cooperative groups or individuals in obtaining credit. For example, donors may particularly wish to support women Farmers' Cooperative Unions in Ethiopia and support efforts to train women on best practices related to leasing agricultural lands while also building capacity to access and effectively manage credit.
2. The evaluation found no evidence for an increase in land rental activity as a result of second-level certification, however this may not be surprising given current provisions which limit the amount of land and time length of land rental contracts. In order to promote "thicker" land rental markets in rural Ethiopia, **policy makers may wish to support efforts to review legal frameworks at the state level for land rentals and, to the extent possible, support revisions to this framework to allow for longer-term leasing and for leasing of larger percentages of a household's land.** Recognizing that there are historical sensitivities related to land accumulation, it may nonetheless be desirable to extend leasehold terms and expand the area that may be leased in order to create more robust incentives for investment of labor and capital and to allow those Ethiopians who lease out land to extend benefits from this activity. It may be useful to consider a radio campaign to educate rural Ethiopians about land values and the legal requirements of land leases as part of such an effort.
3. Given the evidence suggesting an impact of second-level certification on indicators of female empowerment, **policy makers may wish to continue to expand emphasis on joint titling and the issuance of land documentation in both husband and wife's name, for example to areas where joint titling may still be at the discretion of local officials.**
4. Given the fairly large percentage of parcels and households involved in the program for which government was not able to deliver certificates of possession, the evaluation also draws attention to the extent to which second-level certification also rests on activities that may extend beyond the scope of a program's manageable interests, perhaps particularly around the issuance of the formal land documents themselves, which necessarily falls under the purview of government. Given the additional cost to implement second-level certification to completion, and the small magnitude of impacts apparent at this stage, it may be relevant to briefly highlight considerations around program costs relative to household beneficiary impacts, and the sustainability of second-level certification impacts.

From a cost-benefit perspective, it may be noted that while additional benefits to households from second-level certification over first-level certification appear to be fairly small at this stage, relative to what appears to be a fairly large increase in implementation costs over that of the first-level intervention, this does not necessarily suggest that program costs are unwarranted. It is highlighted that from a legal standpoint even if some of the anticipated benefits of second-level certification are potentially less salient to households over the shorter term (as this evaluation may suggest), it is likely that digitizing land records and enhanced longevity and access to land records that is made possible through the second-level process may be necessary to support the development of transparent land markets over the longer term and eventually the spread of credit for rural land holders.

In light of this, and the potential that households which begin the second-level process but do not receive a certificate of possession could be disadvantaged in terms of being able to assert their land claims, perhaps especially for certain types of land challenges that may only emerge over time, as well as to potentially lose faith in program implementation or government land administrators if formal documentation is not received, **policymakers may wish to consider efforts to identify programming gaps and opportunities, for example around capacity, financing, or process for certificate provisioning, as well as enhanced donor coordination around land programming.** Where gaps are identified, policymakers may wish to consider coordinated donor efforts to ensure that new land programming involves such identified components, with a view towards maintaining sustainability of program impacts.

ANNEX I—EVALUATION STATEMENT OF WORK

Annex I is the statement of work (SOW) for the Endline Data Collection efforts as published in “ELTAP/ELAP Impact Evaluation Data Collection: RFP No. 2014-ERC-004” on 2 September 2014. All pages of the original RFP are removed and only the SOW is attached.

REQUEST FOR PROPOSAL

ELTAP/ELAP Impact Evaluation Data Collection

RFP No. 2014-ERC-004

RFP Release Date:	September 2, 2014
Question/ Inquiry Submission Deadline:	Sept 12, 2014 5:00PM ET
Proposal Submission Deadline:	Sept 26, 2014 5:00PM ET
Performance Period (Estimated):	October 2014– March 2015
Anticipated Type of Award:	Firm Fixed Price
Cloudburst Client:	USAID
Cloudburst Project Name:	Evaluation, Research and Communication (ERC)
Prime Contract / Task Order #:	AID-OAA-TO-13-00019
Place of Performance:	Ethiopia
Geographic Source Code:	937*

* includes the United States, the recipient country, and developing countries other than advanced developing countries, but excluding any country that is a prohibited source

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Appendix A

Statement of Work

A. INTRODUCTION

Cloudburst Consulting Group, Inc. (Cloudburst) is requesting qualified and interested parties to submit a response to this RFP for the collection of endline data as part of the impact evaluation and assessment of the USAID Ethiopia's Land Tenure Administration Program (ELTAP) Impact Evaluation (IE). The survey will cover approximately 4,500 households from rural areas in the Ethiopian Highlands and consists of a general household survey plus a questionnaire for wives. The endline survey data will be used in conjunction with the previously collected ELTAP and ELAP baseline data to conduct an impact evaluation (IE) of the program.

B. BACKGROUND

Beginning with Tigray in 1998, the Government of Ethiopia embarked on a rural land registration program to increase the tenure security and certify the long-term use rights of rural households. Followed by Amhara in 2002 and Oromia and the Southern Nations Nationalities and Peoples (SNNPR) regions in 2004, Ethiopia's first level land certification program has been hailed as one of the more successful and cost effective land registration programs. In addition to being considered one of the least costly land registration programs in Africa and elsewhere, Ethiopia's first level land certification program was impressive in how quickly it was scaled up and the large number of households that were covered in a relatively short period of time. By the mid-2000s approximately 20 million plots were registered from 6 million households, with upwards of 12 million households covered by the end of the decade. To date, the Ministry of Agriculture's Land Use Directorate estimates that 90% of farming households have first level land certification. Often associated with the 'green books' issued to households as a record of their land holdings and rights, research to date suggests that first level certification has had a positive impact on a variety of economic outcomes. Among the key findings are increased investment and land productivity, increased land rental market activity, as well increasing women's participation in land market activity.

Despite being an extremely important step in strengthening the tenure security of households who had been subjected to the uncertainty of land redistribution in the decades previous, first level certification is not generally viewed as being viable for the long-term as a result of some key shortcomings. Principal Chief of among these limitations is that the first level certification process did not map individual plots or provide the level of spatial detail documenting boundaries that would allow for the development of cadastral maps for improved land use management and administration. The lack of computerized land registries further complicates the management and updating of registration records. To incorporate the necessary geographic information system (GIS) detail, generate parcel maps, computerize land records and strengthen rural land administration system in general, the Government of Ethiopia (GoE) has been working with USAID and other development partners, including the Swedish International Development Cooperation Agency (SIDA), the World Bank, the United Kingdom's Department for International Development, and the Government of Finland under the Responsible and Innovative Land Administration Project (REILA) in exploring alternative approaches to "second level land certification." The GoE plans to provide second level certification to an estimated 50 million land parcels, and there is considerable interest by GoE and donors for research and

analysis to assess and understand the impact second level certification will have on rural households and the functionality of the land administration system in general.

An Overview of ELTAP and ELAP

Starting in 2005 with the Ethiopia Land Tenure Administration Program (ELTAP), USAID has supported woreda-level (district) land administration agencies in Tigray, Amhara, Oromia and SNNPR to pilot a second level land certification process that relies on the use of handheld GPS units to demarcate plot boundaries. Following the end of ELTAP in 2008, USAID support for second level certification continued under the Ethiopia Land Administration Program (ELAP) running from August 2008 to February 2013.

The Cloudburst Group (under the Evaluation, Research, and Communication (ERC) Task Order) will complete an impact evaluation of second level land certification interventions in Ethiopia with a focus on areas supported by USAID projects.

C. ACTIVITIES

The activities covered under this SOW concern the collection of endline data that will be used in conjunction with the baseline data collected for ELTAP (in 2007) and ELAP (in 2012) to create a matched panel dataset in order to conduct the impact evaluation.

The data collection covered by this RFP involves interviewing approximately 4,500 rural households that were previously interviewed as part of the ELTAP and ELAP baseline data collection. For each household there are two survey components: i) a general household survey; and ii) a wives component. The time expected to complete a single household interview (general household survey plus the wives survey) is approximately 2-4 hours.

In addition to the two household survey components, the endline data collection covered by this RFP also involves interviewing 2 to 3 key informants in approximately 200 villages. The time expected to complete a single key informant interview is approximately 1-2 hours.

The final component of endline data collection covered by this RFP includes collecting data from woreda land administration offices. This involves visiting the land administration offices to collect a limited amount of information on fees and services offered as well as processing times. The questionnaire will be administered in approximately 25 to 20 woredas, and the time expected to complete a single questionnaire is approximately 30 minutes.

The Survey Firm will be expected to complete the following activities associated with this endline household data collection:

1. Activity Timeline Chart and Ethical Clearance Documentation

The Survey Firm will develop the Activity Timeline Chart in collaboration with the ERC Impact Evaluation (IE) Team, outlining the timeline for all IE activities. In addition, the Survey Firm is responsible for acquiring all permissions necessary for conducting the survey. Where required, this may include relevant permissions from national and/or local authorities, and Institutional Review Board (IRB) permissions for protection of human subjects. The Survey Firm is also responsible for adhering to local formalities and obtaining any required permits related to the survey implementation, as well as survey team health and accident insurance, salary, taxes, and others as necessary. Through the course of obtaining ethical clearance, the Survey Firm should also identify and report any respondent compensation packages/gifts according to local custom.

DELIVERABLES:**1.1) Activity Timeline Chart****1.2) Evidence of ethical clearance and any necessary documentation including any documentation required for IRB approval.****2. Tablet Use Agreement**

The endline data collection will be carried out using a tablet-based approach. While there is additional up-front effort required to program the questionnaire, train staff and enumerators on the use of tablets, and manage the tablets and hardware to limit complications in the field, there are a number of clear benefits. In general, a tablet-based approach reduces data entry errors and improves the quality of the data. Most software includes functionality that allows for validating results, pre-populating entries based on prior information (i.e. household roster from a baseline survey), and routing capabilities that modify the information collected based on prior responses. While most survey software packages have these capabilities to some extent, the level of computer literacy and programming skill can vary considerably.

The Survey Firm will be using tablets to conduct the household surveys, key informant interviews, and land administrative questionnaire, and collect data. If necessary (i.e. the Survey Firm does not have its own devices or it would be too costly to procure these), ERC will provide the Survey Firm with the devices to be used for data collection. In this situation the Survey Firm will need to develop a plan for taking possession of the tablets for the purposes of training and for use during the field activities to collect the data, and the returning of tablets following the completion of the field activities and uploading of the data. Prior to taking possession of the tablets plus any accessories (i.e. protective case, memory card, stylus, external battery, etc.) the Survey Firm will be required to verify each tablet and accessory package and sign a Tablet Use Agreement with the ERC representatives from the Cloudburst Group.

The tablet management plan should include:

- Terms for taking possession of the tablets and accessories from Cloudburst;
- When the Survey Firm takes possession of the tablets and accessories;
- Number of tablets and any necessary accessories (i.e. external battery, protective case, stylus, etc.);
- Storage and monitoring of the tablets when not in use;
- Management and tracking of the tablets when in use ;
- Responsibility and care while in possession of the Survey Firm; and
- Return of tablets to Cloudburst and the ERC team following data collection (including terms for withholding final payment until all devices and accessories have been returned to Cloudburst in working order or deducting the value of the tablet and accessory replacement in the case of non-return or damage).

DELIVERABLE:**2.1) Signed Tablet Use Agreement****2.2) Written plan for managing tablets and accessories****3. Survey instrument translation, testing and formatting/adaptation and optimization for use with tablets**

The specific technology package for the tablet-based data collection will be determined well in advance of the planned training and data collection activities. Selecting the specific technology

package – consisting of the software and the type of device (hardware) being used – will take into consideration practical, technical, and logistical considerations. In deciding which technology package to adopt for these activities, ERC will consider input from the Survey Firm including their experience, if any, using electronic devices for data collection and their technical capacity. Although the Survey Firm will be consulted in the process, ERC will make the final decision as to which technology package will be adopted. ERC has experience with two technology packages: i) Open Data Kit (ODK) software on running on smartphones running Android; and ii) Surveybe software on tablets running Windows. Although preference will be given to adopting one of these technology packages, alternative solutions will be considered and may be adopted if warranted. To the extent possible, the functionality of the survey software in the selected package will be used to reduce errors in data entry (i.e. validation checks), pre-populate fields of the questionnaire based on prior round of household data collection (i.e. household roster information such as names from the ELTAP or ELAP baseline survey), and build in routing capabilities to improve efficiency of the data collection and reduce the potential for errors (i.e. collecting information on crop inputs and production only on plots of land which are under cultivation).

The ERC team will provide an English version of the survey instruments to the Survey Firm for translation into Amharic as well other local languages as necessary (i.e. Oromigna, Tigrigna, etc.). The Survey Firm will produce translated versions of the survey instruments in document form. The translated questionnaire document - referred to as the 'paper version' - will be used for training purposes, serves as a backup for data collection in the field, and is a key document to be included in documenting the dataset.

ERC will also provide the Survey Firm with an English version of the questionnaire program file – referred to as the 'programmed version' - for use with the selected technology package. The Survey Firm will use this to produce a program version of the survey instruments that has been translated into Amharic and other local languages as appropriate. Since the programmed version is what appears when enumerators are collecting data in the field, the Survey Firm will need to ensure that the translated version of the survey is accurately entered into the devices.

Note that while the ERC team will be responsible for survey programming, the Survey Firm will be required to pilot and test the questionnaire. The Survey Firm will also be responsible for ensuring that the correct version of the questionnaire has been installed on the devices for training as well as data collection purposes. The ERC evaluation team will work with the Survey Firm to help build the necessary capacity and expertise to efficiently and effectively carry out the data collection activities. Although the ERC team will be responsible for programming, the Survey Firm will need to trouble shoot potential problems as they arise in training exercises as well as when being implemented in the field. In order to achieve this, at least one member of the Survey Firm team will need a basic level of proficiency in the use and application of the survey software to collect data (if not immediately proficient, ERC can work with the Survey Firm to ensure these individual(s) have the skills necessary when required).

Prior to the start of training the Survey Firm will have completed the translations of the paper version as well as the programmed version. Testing and revising of the questionnaire content and software programming will be carried out on an ongoing basis. As a result, the Survey Firm will also produce final versions of the translated paper version and programmed version of the survey instruments and that these will be delivered on or about the same time as the final dataset to be included as part of the overall documentation. Note that the Survey Firm is expected to ensure that the programmed version and paper version reflects the most current version of the survey instruments as has been approved by the ERC.

Prior to the start of training the Survey Firm will have obtained visual examples of first and second level certification documents representative of the regions where the endline data collection will take place. These documents will be used by the Survey Firm to supplement the training and for use by enumerators when conducting field activities.

DELIVERABLES:

- 3.1) Pre-training translated 'paper version' of survey instruments***
- 3.2) Pre-training translated 'program version' of survey instruments***
- 3.3) Final translated 'paper version' of survey instruments***
- 3.4) Final translated 'program version' of survey instruments***
- 3.5) Examples of first and second level certification documents
representative of the regions where data collection will be taking
place***

4. Data Management and Field Sampling Plan

This endline survey involves collecting information from households that were sampled as part of the original ELTAP and ELAP baseline household survey. It is critically important that the same households are interviewed during this endline data collection as were interviewed during the baseline. The baseline data were collected in 2007 for ELTAP and in 2012 for ELAP and was carried out by the Ethiopian Economics Association (EEA) in both cases. The Survey Firm will have access to these baseline data datasets as necessary to facilitate the endline data collection activities. Portions of these baseline datasets contain sensitive information. As a result, the Survey Firm will need to ensure confidentiality is maintained will need to adopt data management protocols to ensure the confidentiality of respondents is maintained.

As part of the field sampling plan, the Survey Firm will need to develop a ground plan for locating those same households using the information contained in the baseline datasets. In addition to the name of the household respondent the dataset provides the region, zone, woreda, kebele, and village. In some of these areas the administrative boundaries (i.e. at woreda or kebele) have been re-drawn in which case it will be necessary to reconcile historic boundaries as they applied during the baseline with current administrative boundaries. Although it is expected that most of the households can be located, there will likely be instances where they cannot. To deal with these the sampling plan should also include a strategy for dealing with household attrition.

Also as a part of the field sampling plan, the Survey Firm will need to develop a strategy for identifying respondents and executing the key informant interviews in approximately 200 villages.

In addition, the Survey Firm will need to develop a ground plan for locating the woreda-level land administration offices in the approximately 25 to 30 woredas where data collection will take place.

In developing the field sample plan, the Survey Firm will produce geographic information systems (GIS) map files containing the administrative boundaries (region, zone, woreda, kebele, and village) as they existed in 2007 and 2012 when the ELTAP and ELAP baseline sampling was carried out. In addition to identifying the locations of village sampled for each of ELTAP and ELAP, the GIS map files will also identify which areas were treatment and controls.

The Survey Firm must develop (or adapt) a robust set of data entry protocols with the ERC team. The survey software being adopted will significantly reduce the level of effort that would have been associated with entering the data following a paper-based approach. By using enumerators tablet entries during the course of surveys to populate a central dataset, the need for data entry personnel to transcribe paper entries is virtually eliminated. However, to make sure the data is organized and documented appropriately requires careful management and monitoring. This entails appropriate attention to setting up the database structure and shell for recording data, monitoring the data as it comes in from the field and identifying problems/issues as they arise, and creation of the final dataset complete with documentation. The data management plan will also include a detailed description of how the data will be managed at all stages given the technology package being employed. For example, how will data be stored and transferred once it has been collected by the enumerators? How often will data be transferred from the field? What are the safeguards that will be employed to secure the data and prevent?

DELIVERABLE:

4.1) Field Sampling Plan approved

4.2) GIS map of sample areas

4.3) Data management plan

5. Staffing

The personnel requirements for this project include:

Core survey team: The Survey Firm will propose the composition of the core survey team (and the level of effort for each position as % full-time positions). At minimum the core team should include the following:

- Project manager: plans, supervises and manages the entire survey with the assistance of the field and data managers. The Project Manager should be based in-country for the entire duration of the survey and must have experience in managing at large-scale household surveys.
- Field manager(s) or Field Team Leaders: responsible for training of field staff; plans, supervises and manages the field work. The Field Manager should be based in-country for the entire duration of the survey and have experience in managing field work of large-scale household surveys.
- Technology, Software and Data Manager: assists ERC team in programming the questionnaire into the survey software, monitors and manages data entry as this is uploaded, processing and consolidation of data. Experience or specific training in data entry for household survey management, and ability to liaise with ERC team on a regular basis.

Field Team: The Survey Firm will propose:

- i) the composition of each field team; and
- ii) the number of field teams.

The number of enumerators and field teams must be known as early as possible to ensure the tablets can be provided to the Survey Firm in a timely and efficient manner. Prior to any training or field activities sufficient piloting of the hardware should be carried out to ensure the hardware and software meets the necessary requirements. Modifications to the questionnaires and programming into the survey software must take into consideration the time and effort necessary to test the updated version and ensure all tablets have been uploaded with the most current version

of the questionnaire. Modifications or additions to the hardware and accessories will take considerable more time due to the logistics associated with sourcing, procuring, and locating a large number of devices/accessories. As such, pre-piloting and testing of the technology package should take place well in advance.

DELIVERABLE:

5.1) Roster of core survey team and their corresponding qualifications.

5.2) Field team composition and recruitment plan

6. Field Work Plan

The field work plan should outline in detail all aspects of the field work to be conducted by the Survey Firm. The work plan should include:

- Final updated Activity Timeline Chart
- Composition of a field team
 - Number of enumerators
 - Number of field-supervisors
 - Qualifications, training of each
- Expected tasks, responsibilities and schedule of delivery of each member of the team
- Number of visits per household (*planning to allow for interrupted surveys, revisions of incomplete or inconsistent information, and quality control*)
- The expected time each team will spend in the primary sampling unit (PSU)
- Transportation and lodging logistics
- Protocol for confirming that the location has been correctly identified
- Supervision and spot check plans to ensure adherence to data collection protocols and confirm quality of data collection and entry (may specify a minimum of, for example, 10% re-visits to a random sample of the evaluation sample to confirm the validity of the data)
- Protocols and procedures for addressing data inconsistencies/misreporting when identified
- Protocols for tablet based-data collection
 - Training staff and enumerators on the use of tablets
 - Ensuring all tablets have the correct software and current version of the questionnaire
 - Logistics and system for recharging tablets and contingency plans
 - Development of instructional materials and field reference materials
 - Checklist of requirements for data collection teams and supervisors
 - Establish plan for enumerator check-in with field supervisors, backing up survey data, and uploading/transferring of data
 - Protocols for timely uploading and backing up of data
 - Plans for trouble shooting and contingency plans in case of tablet failure
 - Transmitting data to central data manager and feedback to the field teams in order to conduct quality checks as needed.
- Data transmission and validation protocols

Prior to commencing field work the Survey Firm will need approval from the ERC team. The Survey Firm must then implement the survey, adhering as closely to the plan as conditions allow. As field conditions dictate significant changes to these plans, the Survey Firm's Field Supervisors are obliged to inform the ERC team in the form of a written report or progress report.

DELIVERABLE:

6.1) Draft Field Work Plan

6.2) Final Field Work Plan

7. Procurement of Materials and Training of Field Staff

Procurement Plan:

If necessary (i.e. the Survey Firm does not have its own devices or it would be too costly to procure these), ERC will provide the Survey Firm with the devices to be used for data collection. If there are any other items needing to be procured by the Survey Firm these will be identified here.

Staff Training:

The core staff from the Survey Firm engaged in managing and carrying out this survey will receive additional training from the ERC team on the approach being adopted. The staff training and support will cover two areas: 1- software programming for adapting questionnaire, and 2- training on the use and maintenance of the phones. Training and instruction of Survey Firm staff in the use of phones for this baseline survey will be carried out in-country with the ERC team. This training should take place as early as possible to acquaint the Survey Firm with the phone-based approach.

Given the large size of enumerators and field teams that will ultimately be involved, the instructional model adopted is one of the training-the-trainers. In addition to the core staff from the Survey Firm, all persons responsible for training and instructing the enumerators will need to be present at these training sessions. The Survey Firm will have developed the overall training plan and identified those individuals tasked with training the enumerators in advance so these can be present at the early training.

Enumerator and Qualitative Training:

A comprehensive general training should be given to the field managers, survey enumerators and qualitative researchers in order to create a team environment and to allow for substitution between roles should any team member take a leave of absence due to illness or other emergency. Because the training should also serve as a screening process for skilled interviewers and data entry agents, the Survey Firm should also recruit more interviewers and qualitative researchers for the training than will be ultimately hired for the project. The supervisors should receive supplemental training as described above.

The training should be scheduled for **approximately 2 weeks**. The Survey Firm and ERC team will need to identify whether or not all training can take place in one plenary group, or if the number of trainees (supervisors, interviewers, etc.) is large, if it is better to divide the training into several sub-groups. In this case, the Survey Firm will still need to standardize training across sub-groups by using the same training materials among trainers. The ELTAP/ELAP IE Country Coordinator will help to organize and facilitate the training.

The Training programs should include:

Classroom Training - Theoretical: Training should include a review of the theory of the quantitative and qualitative questionnaires and each question in order to fully understand the objective of each question. Training should include individual and group exercises to become familiar with the practice of asking questions and filling questionnaires. This part of the training may include in-class demonstrations, where the questionnaire is projected and one interviewer

completes the questionnaire in front of the classroom. The training may also use vignettes, where the firm designs case scenarios based on typical households (perhaps those found during the supervisor training or piloting) and have interviewers complete the questionnaire based on the vignette. Finally, the trainees should conduct pilot interviews/FGDs on the same subject, and have the interviewers fill in a questionnaire for the interview/FGDs to test consistency across the interviewers.

Classroom Training - Tablet: Those trained with the core Survey Firm staff will instruct enumerators on the use of the tablets for data collection. The instruction will cover the practicalities of using the tablet to conduct the surveys. The training will also cover logistical and practical considerations such as charging the device, troubleshooting in the field, and contingency plans and steps if need to revert to a paper-based version. The training session should also discuss the responsibilities of the enumerator and to ensure proper care is taken protect the tablet and accessories from theft and damage.

The Survey Firm will draft and develop training materials. If necessary, the training materials and field manuals will be translated to the local language.

DELIVERABLES:

- 7.1) Document and Procure any additional materials (i.e. charging stations, memory cards, etc.)***
- 7.2) Report on training activities***
- 7.3) Phone and tablet use and troubleshooting guide***
- 7.4) Locally adapted training materials and field manuals.***

8. Pilot Test

After the theoretical and classroom practices, the interviewers should go to the field to administer the full questionnaire to a small number of households (outside the study sample). During the pilot test the community survey should be administered to at least 2 communities and the land administration questionnaire piloted in one woreda land office. The pilot test should simulate the administration of the questionnaire under normal circumstances.

Indicators of success include:

- Interview teams correctly list, sample and interview households in the enumeration area
- Interview team members understand their roles
- Interview team members understand, and correctly follow interviewing protocols
- Data from households (outside of the study area) are successfully collected, aggregated, trial dataset has been generated, and supervised for quality without major data entry program problems

DELIVERABLE:

- 8.1) Report on pilot test outcome***
- 8.2) Dataset (in properly documented format) from pilot test transferred to ERC***

9. Field Work Management and Supervision

To ensure field teams and enumerators are as prepared as possible and capable of carrying out the survey as efficiently as possible, the Survey Firm will develop a field team checklist along to aid in the implementation and supervision. The field team checklist will ensure each team and

enumerator has all the materials necessary to conduct field activities and what to do in case they encounter a problem. The checklist to be developed may include:

- Enumerator has received tablet and accessories and is responsible for these
- Necessary field and training guides
- Tablet troubleshooting guide
- Contract information of field supervisor, project manager, data manager, etc.
- Letter from Survey Firm and any other agencies/organizations as appropriate
- Back-up paper versions of questionnaire
- Etc.

DELIVERABLE:

9.1) Field team checklist

10. Baseline Data Collection

A successfully completed survey sample location includes the following:

- Dataset containing all of the data coded from the cluster, including complete data from the listing exercise, household, community
- Field Manager's report that documents:
 - Dates of arrival and completion of each PSU
 - Any notable difficulties or deviations from the standard field plan
 - Record of each substitution of households that may have been required, including the reasons for substitution
 - Any other notable occurrences
- Report on real-time validity checks upon receipt of each PSU's/cluster's data.

Conduct final cleaning of data and final data delivery report:

- Identify incomplete HHs and redundant observations
- Final completion numbers

DELIVERABLE:

10.1) Preliminary database

10.2) Project Manager's bi monthly written report of the baseline data collection, including the information detailed above.

10.3) Completed Databases, including the listing data, household data, with data correctly organized, variables named and labeled

11. Return of Tablet

Once the data collection has been completed the Survey Firm will complete a completion inventory and transfer ownership of the tablets and accessories back to the ERC team. When completing the checkout the value of any missing or damaged items (tablet or accessories) will be deducted from the final payment.

DELIVERABLES:

11.1) Tablets returned and check-out completed.

D. DELIVERABLES SCHEDULE

Tentative delivery dates and estimated level of effort schedule is described below.

The ELTAP and ELAP endline data collection will draw heavily from previous survey instruments. It is expected that the endline household survey and all related activities can be carried out in a 4 month period (provided household surveys and actual field work takes place at the end of the harvest season in early spring).

Deliverable	Date
Signature of Contract	Oct. 10
1.1) Activity Timeline Chart 1.2) Evidence of ethical clearance and any necessary documentation	1.1) Oct. 31 1.2) Nov. 14
2.1) Signed Tablet Use Agreement 2.2) Written plan for managing tablets and accessories	2.1) Nov. 14 2.2) Nov. 14
3.1) Pre-training translated 'paper version' of survey instruments 3.2) Pre-training translated 'program version' of survey instruments 3.3) Final translated 'paper version' of survey instruments 3.4) Final translated 'program version' of survey instruments 3.5) Regional examples of first and second level certification documents	3.1) Nov. 14 3.2) Nov. 14 3.3) Dec. 12 3.4) Dec. 12 3.5) Nov. 14
4.1) Field Sampling Plan approved 4.2) GIS map of sample areas 4.3) Data management plan	4.1) Oct. 31 4.2) Nov. 14 4.3) Nov. 14
5.1) Roster of core survey team and their corresponding qualifications. 5.2) Field team composition and recruitment plan	5.1) Oct. 31 5.2) Oct. 31
6.1) Draft Field Work Plan 6.2) Final Field Work Plan	6.1) Oct. 31 6.2) Nov. 28

7.1) Document and procure additional materials needed	7.1) Nov. 14
7.2) Report on training activities	7.2) Nov. 28
7.3) Phone and tablet use and troubleshooting guide	7.3) Nov. 14
7.4) Locally adapted training materials and field manuals.	7.4) Nov. 14
8.1) Report on pilot test outcome	8.1) Nov. 28
8.2) Dataset (in properly documented format) from pilot test transferred to ERC	8.2) Nov. 28
9.1) Field team checklist	9.1) Nov. 14
10.1) Preliminary database	10.1) Feb. 6
10.2) Project Manager's bi monthly written report of the baseline data collection, including the information detailed above.	10.2a) Dec. 12 10.2b) Dec. 26 10.2c) Jan. 9 10.2d) Jan. 23 10.2e) Feb. 6 10.2f) Feb. 20
10.3) Completed Databases, including the listing data, household data, with data correctly organized, variables named and labeled	10.3) Mar. 20
11.1) Tablets returned and check-out completed.	11.1) Feb. 6

ANNEX II—EVALUATION METHODS AND LIMITATIONS

MODEL SPECIFICATIONS AND KEY ASSUMPTIONS

The study adopts two statistical approaches to estimate the average treatment effects of second-level certification relative to first-level certification on the outcome families described above: a difference-in-difference (DID) approach and a non-parametric entropy balancing approach coupled with the DID. For each outcome family, the evaluation estimates impacts across a select set of indicators that represent the strongest or most direct measures available from the survey data.

DIFFERENCE-IN-DIFFERENCE

The study uses a difference-in-difference (DID) estimator with panel data and fixed effects to obtain estimates of program impacts. The general frame of the model is:

$$Y_{it} = \beta_1 \text{Time}_t + \beta_2 \text{Treatment}_{it} + \eta_i + e_{it}.$$

where Y is the outcome of interest at time t for household i and η are household-level fixed effects. The constant β_2 is the main estimate of interest: it represents the differential change on the treatment households that is attributable to the treatment itself and not to other confounding factors. Cluster robust standard errors are used to account for serial correlation in responses across households within the same kebele.

The DID approach controls for time invariant differences between treatment and control groups; this includes unobserved characteristics and those which have not been taken into account directly in the analysis. The DID approach also assumes that the change in mean outcomes for households at baseline and endline across treated and control kebeles would have followed a similar trend if second-level certification had not been introduced in kebeles which received this treatment. In other words, kebeles are assumed to have parallel trends in broader context factors that also influence the outcomes expected under land certification.

Analysis of pre-treatment covariates suggests that this key assumption may not hold for the ELTAP/ELAP program. Preliminary analysis showed relatively poor overlap in distributions of several of these covariates across the pool of treated and control households in the sample, particularly on some geospatial characteristics related to market access and agricultural potential that could have an important influence on outcomes (See Figures 2.6–2.16 below, in which there is a statistically significant difference between treatment and control groups on proxies for baseline market access and agricultural potential for several of the outcome indicators, before entropy balancing). These underlying distributions for key pre-treatment covariates suggested that second-level certification may have been implemented in places that were already, on average, doing better across certain indicators of household development outcomes, or better situated in terms of markets or potential agricultural investments that households might make. While this non-random implementation of second-level certification is very

understandable from a programming perspective, it does introduce additional challenges for rigorous estimation of program effects, as it is difficult to account for the full range of unobservable differences across treatment and control kebeles.

When programs are implemented non-randomly, the assumption in the program evaluation literature is that selection issues and unobserved endogeneity are likely to drive results unless they are explicitly addressed in the modeling. For ELTAP/ELAP, since the analyses suggest there is clear imbalance across treatment and control groups on at least some key characteristics related to market access and agricultural potential (for example, distance to major urban centers or the regional capital; and variables related to agricultural potential, such as soil quality, annual precipitation, temperature and elevation), the analytic strategy used by this evaluation employed techniques which better account for this confounding. This includes the use of fixed effects models, and adding an entropy-balancing procedure to re-weight observations as a form of matching (further described below). These analytic steps increase the confidence that the impact estimates which are obtained are indeed attributable to the effect of second-level certification and not to confounding influences (in other words, it increases confidences that the significant impacts which are found, are indeed due to second-level certification).

ENTROPY-WEIGHTED MATCHING

Matching techniques essentially aim to mimic a randomized experiment by ensuring that the treatment and control groups have similar distributions in observed characteristics (Hainmueller, 2011). The aim of preprocessing with matching and reweighting is to improve the covariate balance between treatment and control groups. However, unlike randomized experiments, matching relies on the assumption of selection on observables—that *all* of the variables used to assign treatment and control are included in the matching. In most observational studies this assumption is implausible because the process used to assign treatment is unknown.

Fortunately, the identification strategy for this analysis is strengthened because there is an understanding of the process used by program implementers to select the woredas and kebeles in each region which would receive second-level certification. Program documentation indicates that assignment to treatment (first- and second-level certification) was based on the following characteristics, for ELAP:

- High agricultural potential in terms of high rainfall, irrigation, and cash crops grown;
- High land transaction in terms of renting and sharecropping;
- Good infrastructure and access to markets;
- Presence of agricultural investors.

The set of pretreatment covariates to match on included household and kebele-level variables designed to measure and control for these characteristics. Geospatial characteristics to represent broader village context and market and agricultural potential included factors such as distance to urban centers and the regional capital, soil quality, elevation, and mean annual temperature and precipitation. At the household level it included factors such as household literacy, family size, gender of household head, and prior experience with land expropriation. The full list of covariates, and their balance characteristics across treatment and control groups before and after matching, is elaborated below in Figures 2.6-2.16.

The study explored three different techniques for matching and reweighting observations. Following best practices, the matching procedure which yielded the best reduction in bias across the most important covariates was selected for subsequent use in the matching approach (Austin 2009). First, propensity score matching was used, with weighting based on the Mahalanobis distance metric.

Propensity score matching pairs treatment to control observations based on the estimated probability of assignment to treatment (in this case, moving from first- to second-level certification). Logistic regression is used to estimate the propensity score, which is used to match treated and control households. Unmatched control observations are then discarded from the analysis. Finally, the observations are reweighted using the Mahalanobis distance metric. Combining the Mahalanobis metric with propensity score matching has been found to have preferable qualities to using propensity score matching alone (Rosenbaum and Rubin, 1985).

Second, propensity score matching was used, with reweighting via a genetic algorithm (Diamond and Sekhon, 2013). This technique also matches based on the propensity score, but it uses an evolutionary search algorithm rather than the Mahalanobis distance metric to find weights for each covariate that optimizes covariate balance. Genetic matching often finds better balance than propensity score matching, and the estimations are typically less biased than those obtained via propensity score matching alone (Diamond and Sekhon, 2013).

Third, entropy balancing was employed, a technique for preprocessing data which reweights observations without matching (Hainmueller, 2012). As with matching, the user specifies a set of covariates which form the basis for a reweighting scheme. An entropy balancing algorithm then finds weights for observations in the control group, and no matching or discarding of observations occurs.

The main data for the analysis comes from the ELTAP/ELAP baseline and endline surveys. We draw on additional covariates to measure agricultural potential at baseline, including average rainfall, average temperature, elevation, and terrain roughness, drawn from interpolations by the WorldClim project at UC Berkeley (Hijmans et al., 2005). Ultimately we conducted the matching based on the entropy balancing approach, as it yielded the best bias reduction across covariates of interest (Austin, 2009).

SUB-GROUP ANALYSES

The study examined heterogeneity in treatment effects for seven program relevant factors¹⁹:

1. Female-headed vs male-headed households
2. Widows vs other households
3. ELTAP vs ELAP rounds
4. Total landholding at baseline
5. Household distance to regional capital city
6. Household wealth status
7. Age of household head (impacts on youth-headed households²⁰ are also captured here)

¹⁹ An ex-post disaggregation was also considered, to assess Tigray region outcomes separately from the other three regions of ELTAP/ELAP implementation due to program implementation differences in Tigray. This is because implementation of first-level certification in Tigray began several years earlier and was more widely implemented than in the other three regions. In the remaining regions, second-level certification was implemented shortly after or in lieu of first-level certification, thus the extent of household exposure to and experience with the first-level process in these regions was likely to be quite different. Moreover, first-level certification in Tigray focused on providing documentation in the name of the household head, while in the other three regions husbands and wives were jointly listed in married households (Deininger et al., 2008). Bezu and Holden (2014) provide additional details regarding the nature of the decentralized implementation process for first- and second-level certification, and also describe variations across different regions. However, given that this IE was not designed to identify impacts within regions, unfortunately it does not have a sufficient sample size within each region for this sub-group analysis by region to be sufficiently powered. A credible analysis would have required increasing the cluster and household sample size within regions from the time of the baseline data collection and onwards.

²⁰ Youth-headed households are defined as households where the household head was < 35 years in age.

Binary sub-groups were created on the basis of household head gender (male- and female-headed households, MHH and FHH); marital status (widows and other households); and ELTAP and ELAP rounds of baseline data collection. For each of these groups of interest, separate panel DIDs with fixed effects were conducted for each sub-group, and a z-score was constructed from the difference in impact estimates for each group. The z-score can be interpreted as the number of standard deviations by which the effect sizes differ for the two sub-groups. A difference of more than two standard deviations indicates that the difference in mean treatment across the two group effect is not likely to be due to chance. This is interpreted as support for a significant difference in treatment effect between the two groups (for example, between impacts for female and male-headed households).

HETEROGENEOUS EFFECTS

To examine heterogeneity, the study used Local Regression (LOESS) plots to assess how impacts vary across the distribution range for a set of four continuous factors. The plots enable observation of how second-level certification treatment impacts change across values of a key moderating variable. The shape of the line, and whether the confidence interval crosses zero or not, informs as to whether there is evidence of non-linear or heterogeneous effects across different values of the moderating factor. It also guides the pursuit of additional significance testing of different treatment effects within the sub-group.

The LOESS plots are accomplished using an approach that is similar to a kernel estimate. For each point estimate k , all observations i are included within a bandwidth z such that $k-z < i < k+z$. So for example the estimated effect for taking out credit at $k=50$ kms from the nearest killil capital with a bandwidth $z=5$ km includes all observations from all towns between 45 km and 55 kms; the estimated effect of treatment on taking out credit at 51 kms from the nearest killil capital will include all towns from 46 to 56 kms; etc.

ROBUSTNESS CHECKS

To examine the robustness of the impact estimates, the study relied on alternative model specifications, particularly across results from the fixed effects DIDs and the entropy-weighted DIDs. Additionally, a 'false discovery rate' (FDR) adjustment was used, to correct p-values from each test for the fact that multiple tests were run within each outcome family and across subgroups (Benjamini and Hockberg, 2000). Given the number of tests that were run, some portion of the significant results obtained would be expected to be simply due to chance. Put differently, the more tests that are run, the higher the likelihood that some of them will come back significant, but some of these are likely to be false positives. Results that maintained their significance even after the p-values were adjusted via the FDR correction are considered highly robust.

Lastly, a cross-sectional multiple treatment group DID was run that estimated impacts for households with no certification, second-level survey only, and second-level survey and certification, each relative to first-level certification. Those results tend to additionally confirm the small but significant credit, tenure security, and female empowerment impacts relative to first-level certification that were obtained via the entropy-weighted fixed effect DID models, while also contextualizing those impacts relative to no certification (See Figure 2.2 below).

To bolster robustness, it is noted that the impact estimates from the entropy balanced DIDs were in all cases smaller than those from the unweighted DIDs. This provides additional indication that the

entropy balancing is accounting for some selection bias that might overestimate treatment effects, and which may not be fully accounted for in the unweighted DID. In other words, the entropy balancing across a set of covariates that relate to non-random implementation of second-level certification does a better job factoring out the influence of these potentially confounding selection biases in where second-level certification was implemented, across treatment and control households. The entropy balanced results are thus deferred to for this evaluation, when they differ from the DID estimates, as they are more likely to indicate impacts that are attributable to second-level certification only, irrespective of confounding influences. The results based on the un-weighted fixed effects models, which do not factor out all of the influence of context variables that program implementers thought might facilitate the program to work better, can be thought of as suggestive of outcomes when the program is selectively implemented in contexts where it is thought to be more successful.

It is also useful to consider the extent to which potential bias arising from time-varying unobservable factors²¹ could plausibly explain the results, as this is a potential pitfall with any DID approach (Rosenbaum, 2002). The research team currently has no indication of a strong presence of such time-varying but unobservable factors. If present, they would need to have changed during the time period of the evaluation (i.e., large shifts between 2007 and 2015), have occurred prior to the introduction of second-level certification, and to have co-varied with it, in order to strongly bias the results. If there are such time-varying unobservable factors that are not adequately captured across the current set of observable household and village context factors on which the entropy-balancing was conducted, the result of controlling for them more explicitly could be a lower magnitude or reduced statistical significance of outcomes, relative to the current impacts obtained. In that sense, current results could be thought of as an upper bound on actual magnitude of impacts, if time-varying unobservable but confounding factors are present.

POWER CALCULATIONS

Given the nature of the dataset, and the fact that baseline data collection was designed and implemented independently of ERC's evaluation design and role in the endline data collection, the intra-cluster correlation coefficients (ICCs) were re-calculated for each of the 20 outcome variables assessed and power calculations were re-run for this endline analysis. This was to ensure the study had sufficient power to detect policy-relevant program impacts where they existed, given the data structure, variability around responses and actual ICCs obtained. This was also done to check that there was sufficient power to detect effects across the different treatment definitions that were used, given that the smaller sample sizes available across Treatments A, B, and C are likely to have power implications for the analysis. In general, the evaluation has a fairly powerful design to work with, in that it is a (mostly) balanced repeat-measures cluster-randomized design with household-level outcomes and blocking across regions. Given that there are an average of 15 households surveyed across 285 kebele clusters, with a balanced sample blocked across 4 regions, and panel data (the same households were surveyed at baseline and endline), Treatment D, which used nearly the full sample of households surveyed, is powered to detect even fairly small effects where they exist. The Minimum Detectable Effect Size (MDES) that is likely to be detectable with the statistical analyses is around 0.20 (Figure 2.1).

Treatment A is also well-powered to detect effects in the small to medium effect size range for 16 of the 20 outcome indicators assessed (that is, MDES values under Treatment A range from 0.10 to 0.34,

21 Note that time-invariant confounders and aggregated trends across the study area are already controlled for in the fixed effects DID model.

translating to a 10 to 34% detectable magnitude of change depending on the outcome). The magnitude of detectable effect is somewhat higher for the two land rental activity indicators and the number of parcels and area of land held only by the wife, due to higher response variability around these indicators. For these four indicators, the study is powered to detect magnitudes of change ranging from 38 to 44% under Treatment A. The power calculations at endline indicate that Treatment A is sufficiently powered to detect fairly fine-scale and program-relevant effect sizes if they existed, for nearly all indicators assessed. Thus, low study power is not a likely explanation for null effects on these indicators, although measurement errors or variability across baseline and endline could still contribute to non-significant findings, as is always a possibility for panel studies.

MDES calculations across all outcomes for each endline analysis treatment definition are presented in Tables 3.35–3.38 of Annex III. It is useful at endline to consider the extent to which issues with study power may or may not have contributed to null results where they are present. But, it should also be noted that while power calculations are important for gauging what is likely to be a sufficient sample size needed to detect effect sizes of interest, ultimately they provide soft rather than hard guidance around the actual size of impact a study is likely to be able to detect.

Treatments B and C are also powered to detect a medium to large magnitude of program impact if it exists, however these treatment definitions are somewhat less powered to detect finer-grained effects for some indicators. This is because although the ICC values remain very similar to the full sample (values of ρ

range from 0.01 to 0.41 across the different outcome variables assessed), the total number of clusters (kebeles) is lower under these more restricted definitions of treatment, and this smaller cluster N contributes to lower power to detect fine-grained effects.

The total number of kebeles (or village clusters) in the sample drops for each of these treatment definitions because kebeles are excluded from the analyses for which there was no certification process under way at all at baseline (that is, kebeles which had not received first-level certification at baseline were excluded from the analyses for each of these three treatment definitions). Given the interest of this evaluation in determining the impacts of second-level certification relative to first-level certification, it is appropriate to drop these kebeles from the analyses. However, the smaller number of kebeles in the sample for each of these treatment definitions results in somewhat reduced power to detect small impacts of second-level certification if they exist. Nonetheless, the evaluation was powered to detect medium to large-scale program impacts if they existed, for nearly all outcomes assessed, under any of the four different treatment definitions used.

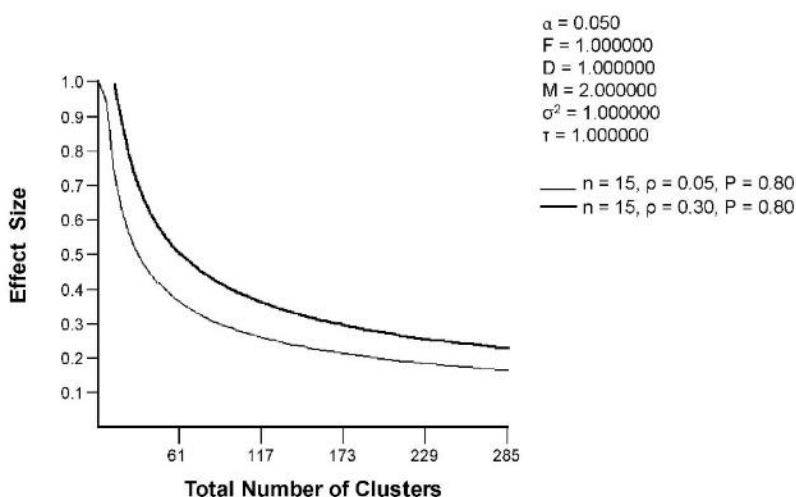


FIGURE 2.1. MINIMUM DETECTABLE EFFECT SIZE

The study was not powered to detect small-scale program impacts for some indicators, which means that for such outcomes the study would not be able to distinguish a small true effect from no effect under the statistical models that were used. This could particularly apply to the two land rental activity indicators, which had lower power across all treatment definitions due to especially high response variability on these indicators. Here, as for the study in general, the assumption is made that given the relatively large cost to implement second-level certification across the 4 regions assessed, evidence of very small or fine-scale program impacts, while certainly interesting, are less likely to play a strong role in altering programming decision-making. That is, although the evaluation is not powered to differentiate between very small impacts and no impacts for some of the outcomes assessed, it is suggested that from a programming perspective, such fine-scale impacts, if they exist, may be likely to be acted on similarly to findings of no impacts, given the cost of the program. Depending on the outcome indicator, the evaluation is generally powered to detect effect sizes that are in the 0.10–0.25 range, which are at a scale that is more likely to present actionable information for programming.

SUPPORTING CHARTS AND DATA

On the following pages of Annex 2 there are supporting charts, figures, and maps. The list of figures is as follows:

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22 Ensuing figures 2.6–2.16 show balance characteristics for eight pre-treatment covariates across treatment and control groups, before and after control observations are reweighted via entropy balancing, for each outcome indicator assessed. There is one 4-part figure for each outcome indicator. For each covariate listed along the Y-axis of a given chart, the statistical significance is shown for a t-test of difference in means across treatment and control groups, prior to entropy weighting (triangle symbols, 'Before_Bal'), and after the entropy balancing (circular dots, 'After_Bal'). The x-axis shows the p-value for each T-test. Values less than $P=0.10$ (or, left of the bold dash vertical line) are statistically significant, indicating that treatment and control groups differ from each other on this characteristic. Values at $P=0.00$ (or, at the short dashed line) indicate covariates for which the unweighted treatment and control pools are highly different from each other. As the charts show, treatment and control groups were often significantly different from each other on key proxies for market access and agricultural potential (such as distance to regional capital, mean annual temperature, or annual precipitation) prior to entropy balancing. The chart also shows that these differences were effectively mitigated via entropy balancing, in most cases. This holds for most outcomes assessed, and across each of the four different treatment definitions used. In other words, entropy balancing was generally effective at removing significant differences in balance across treatment and control pools, for key covariates which relate to non-random program implementation and which could also bias outcomes. This bolsters confidence that results from the entropy-weighted fixed effects models reflect impacts due to second-level certification rather than confounding influences.

23 Ensuing figures 2.17–2.20 map the locations of treatment and control clusters of households by kebele, for each of the treatment definitions used in the analyses (Treatment A, B, C and D). The maps show that there is generally strong spatial proximity among treatment and control controls, providing evidence of similarity of geospatial, administrative and landscape context across the treatment and control pools and further bolstering the comparability of the two pools used in the analyses. Note that even in cases of weaker overlap by physical location, the entropy balancing approach on key geospatial and village context variables ensures that control household units with comparable such characteristics to those of treatment households are used in the analyses.

FIGURE 2.2. IMPACT ESTIMATES AND 95% CONFIDENCE INTERVALS FOR MULTI-ARM TREATMENT COMPARISONS, BY OUTCOME FAMILY

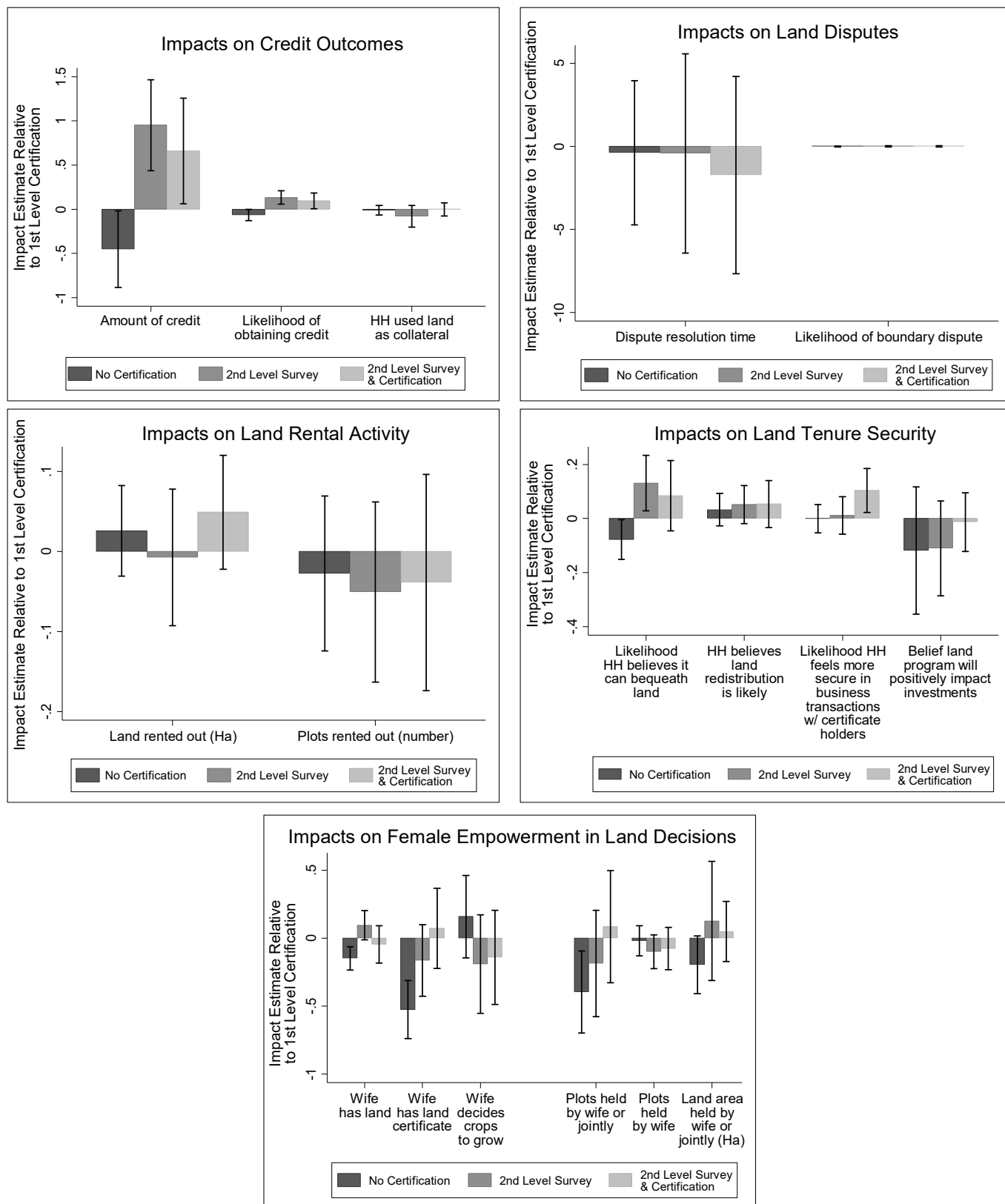


FIGURE 2.3. DENSITY DISTRIBUTIONS ON HH CHARACTERISTICS (TREATMENT B)

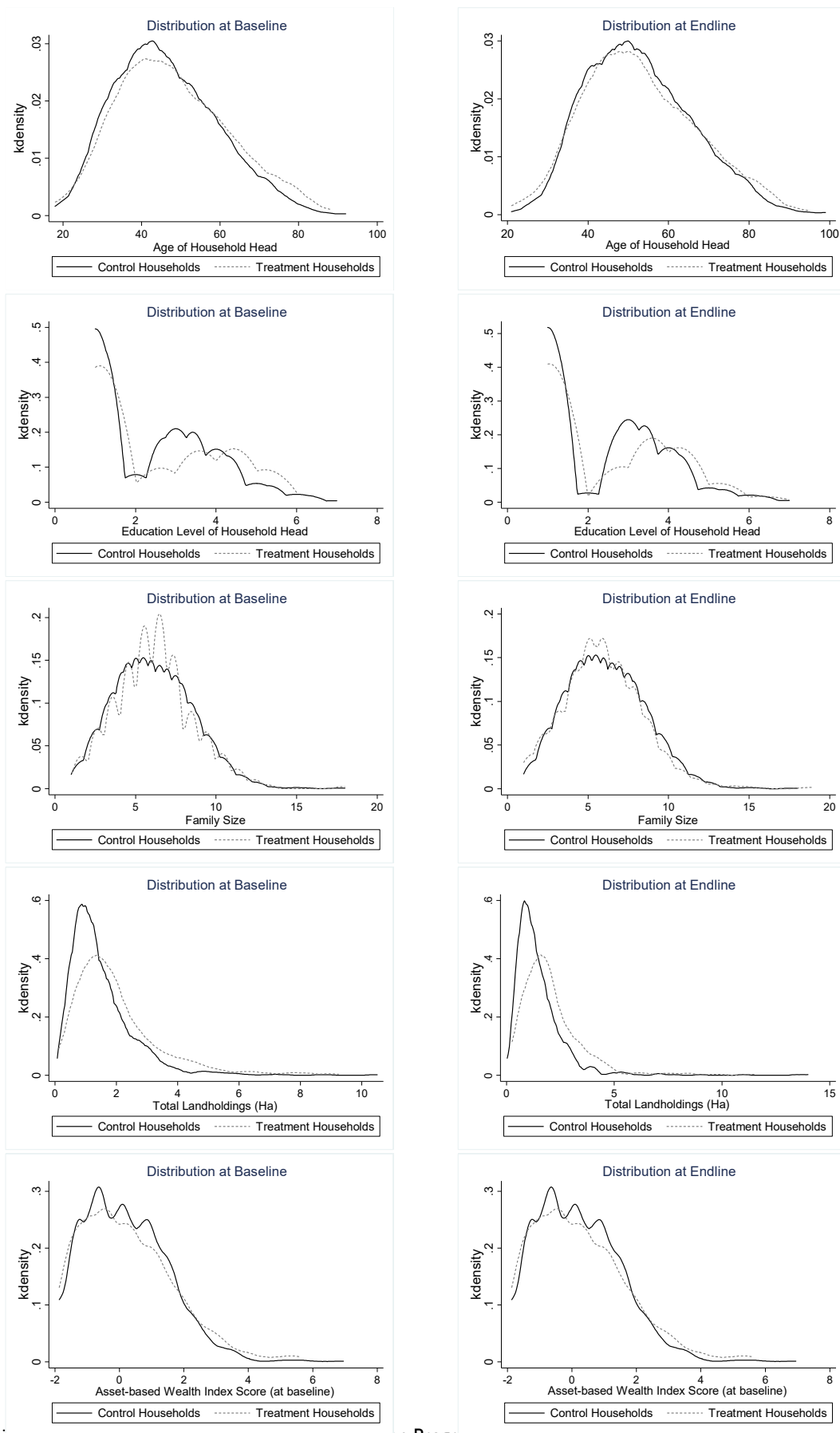


FIGURE 2.4. DENSITY DISTRIBUTIONS ON HH CHARACTERISTICS (TREATMENT C)

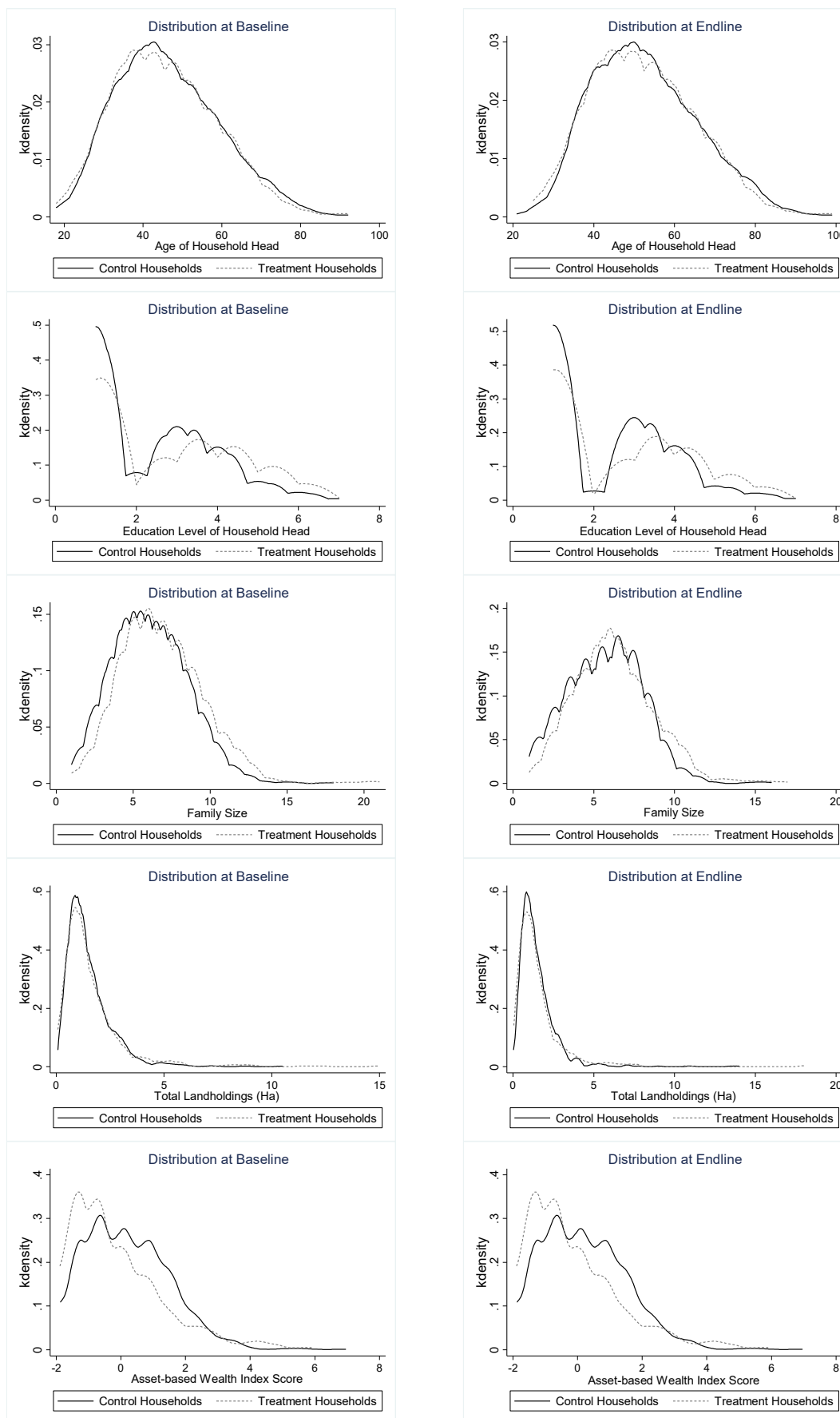


FIGURE 2.5. DESCRIPTION OF HOUSEHOLD SAMPLE SIZE AND TREATMENT COMPARISON GROUPS²⁴

TREATMENT A					
Household status at endline					
Household status at baseline	No certification	1st level certification	2nd level survey	2nd level certification	Baseline Totals
No certification	177	765	609	351	1,902
1st level certification	118	1,017	539	345	2,019
2nd level survey or certification	6	5	38	349	398
Endline Totals	301	1,787	1,186	1,045	4,319

TREATMENT B					
Household status at endline					
Household status at baseline	No certification	1st level certification	2nd level survey	2nd level certification	Baseline Totals
No certification	177	765	609	351	1,902
1st level certification	118	1,017	539	345	2,019
2nd level survey or certification	6	5	38	349	398
Endline Totals	301	1,787	1,186	1,045	4,319

TREATMENT C					
Household status at endline					
Household status at baseline	No certification	1st level certification	2nd level survey	2nd level certification	Baseline Totals
No certification	177	765	609	351	1,902
1st level certification	118	1,017	539	345	2,019
2nd level survey or certification	6	5	38	349	398
Endline Totals	301	1,787	1,186	1,045	4,319

TREATMENT D					
Household status at endline					
Household status at baseline	No certification	1st level certification	2nd level survey	2nd level certification	Baseline Totals
No certification	177	765	609	351	1,902
1st level certification	118	1,017	539	345	2,019
2nd level survey or certification	6	5	38	349	398
Endline Totals	301	1,787	1,186	1,045	4,319

MULTIPLE TREATMENT GROUPS					
Household status at endline					
Household status at baseline	No certification	1st level certification	2nd level survey	2nd level certification	Baseline Totals
No certification	177	765	609	351	1,902
1st level certification	118	1,017	539	345	2,019
2nd level survey or certification	6	5	38	349	398
Endline Totals	303	1,787	1,186	1,045	4,319

Color Coding Legend:	
	Discarded from the analyses
	Control Group
	Treatment Group

²⁴ Note that 118 households which reported contradictory certification status across baseline and endline were dropped from the analyses, due to uncertainty around their true status. Such differences could also be explained by data recording or entry errors, but since corrected status could not be verified these households were excluded from the analyses.

FIGURE 2.6. COVARIATE BALANCE FOR *CREDIT_AMT* ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

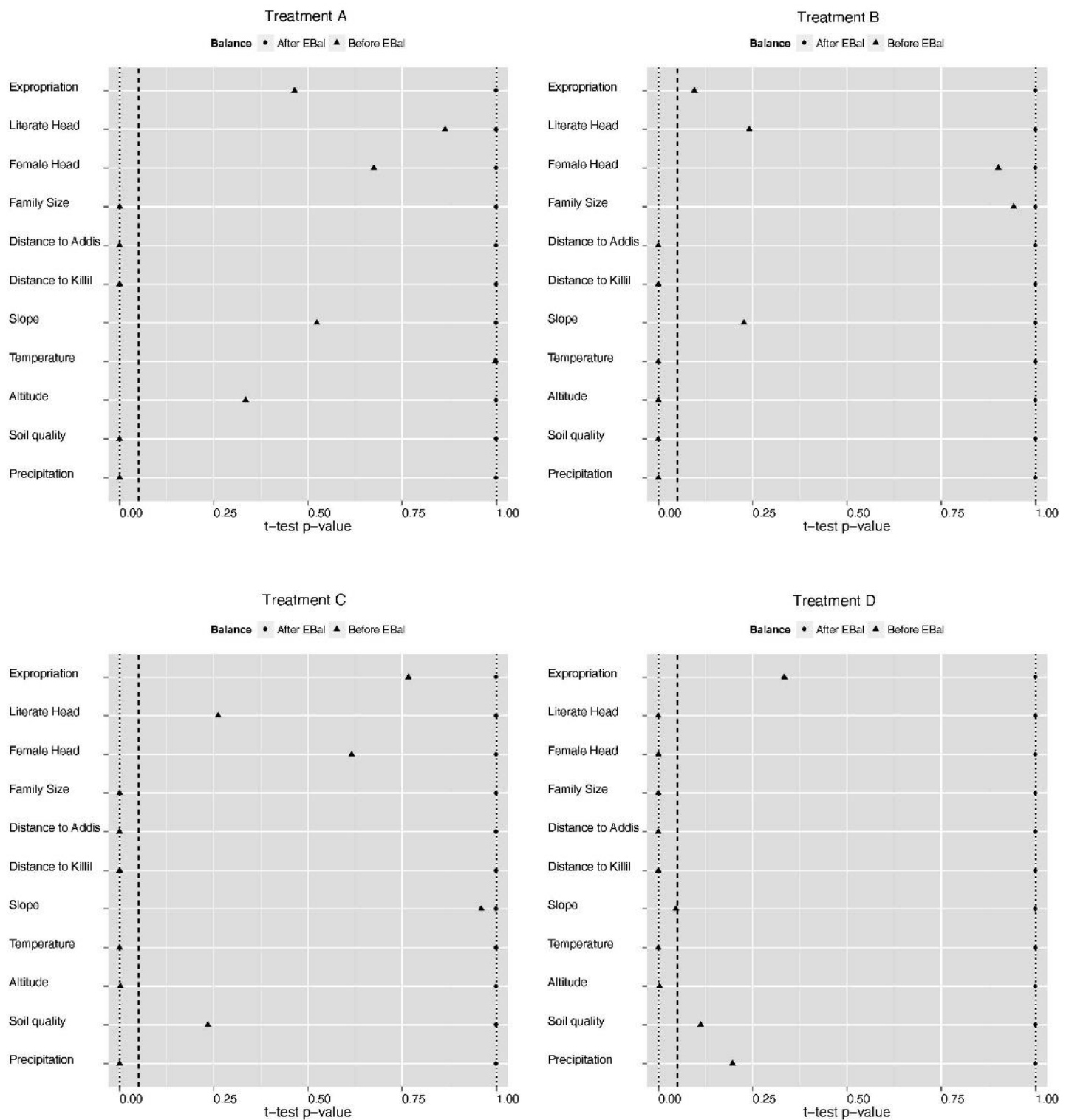


FIGURE 2.7. COVARIATE BALANCE FOR *CREDIT_COLLAT* ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

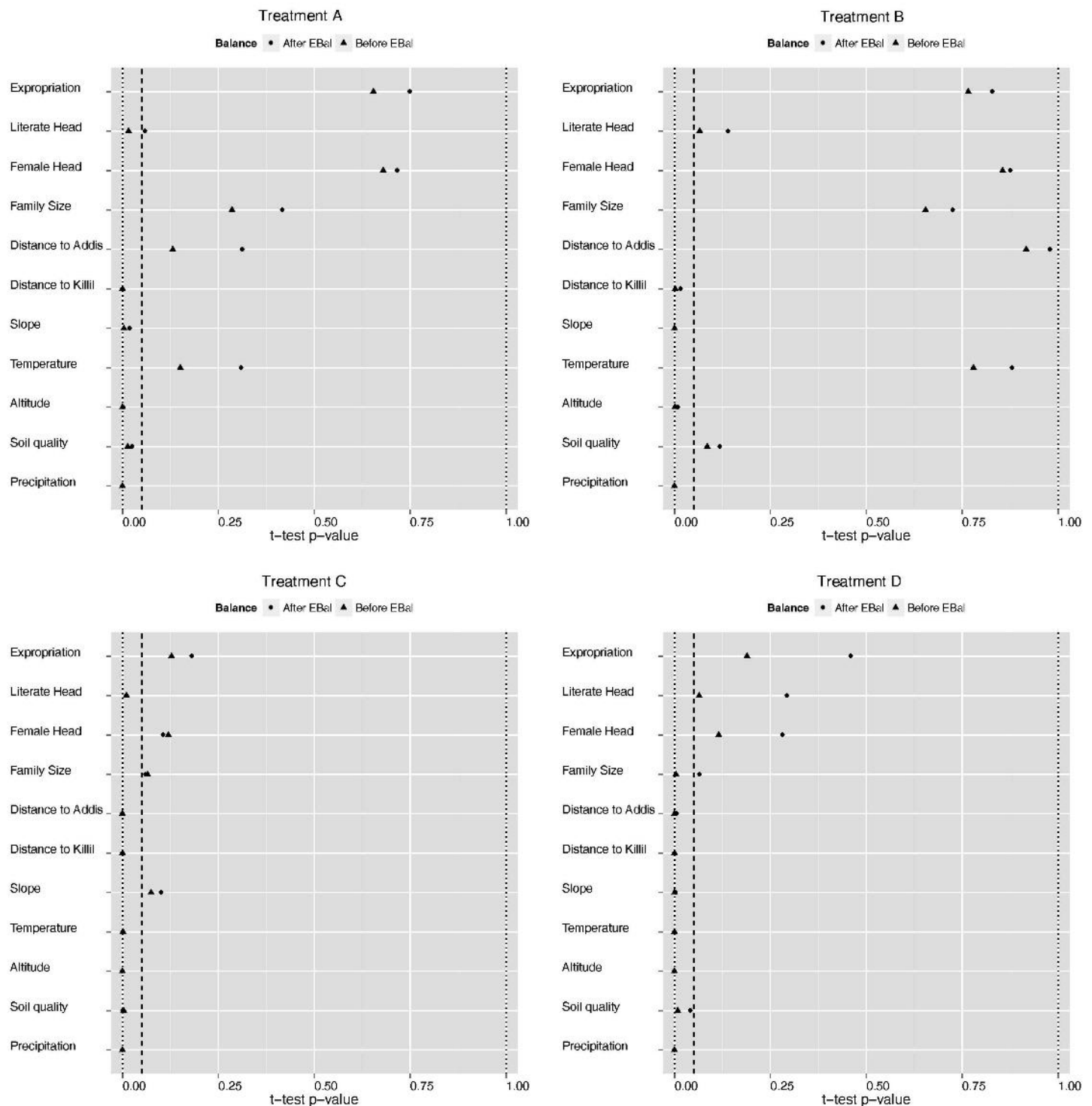


FIGURE 2.8. COVARIATE BALANCE FOR *CREDIT_FARM* ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

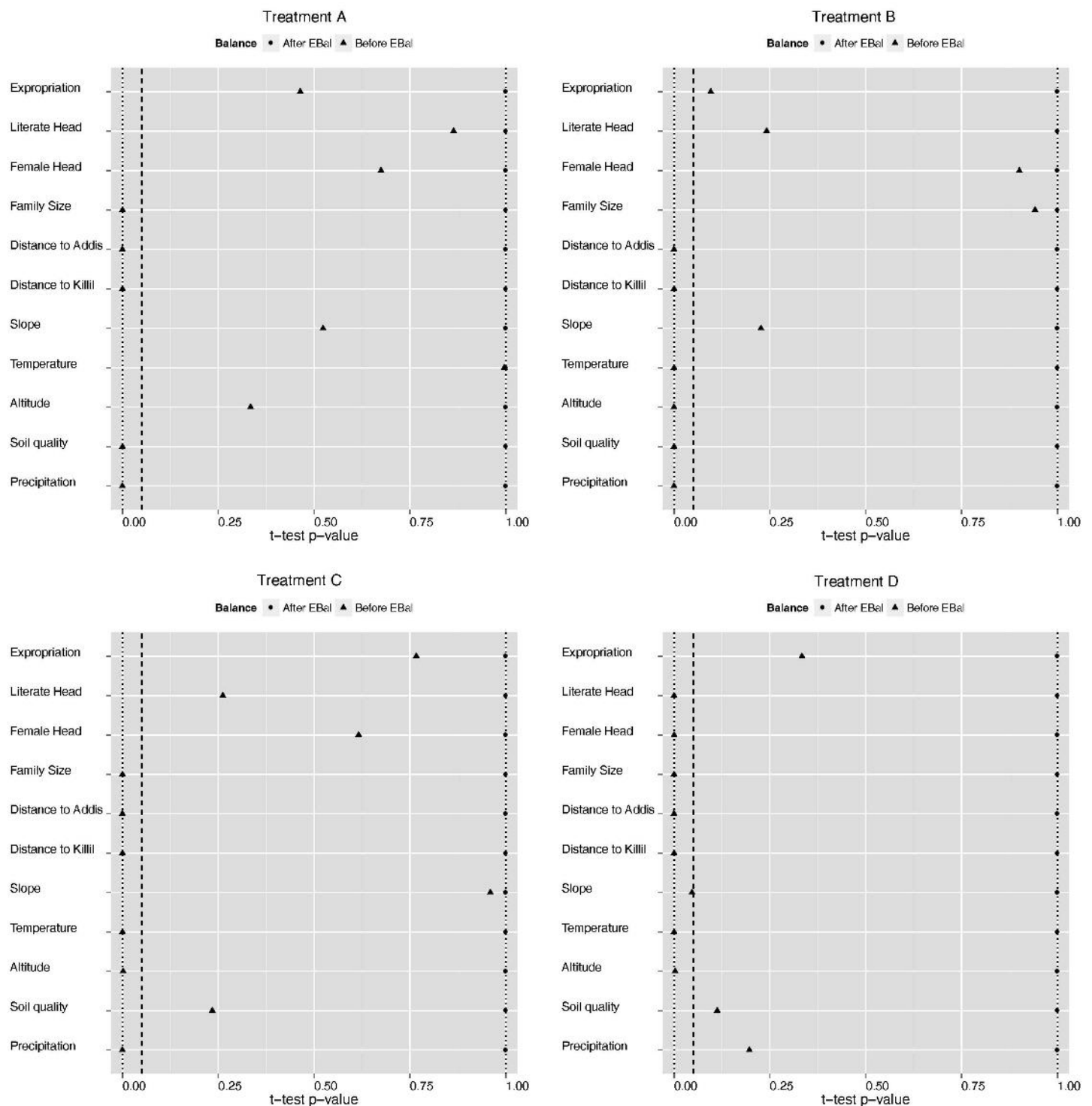


FIGURE 2.9. COVARIATE BALANCE FOR *TENURE_BUSINESS* ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

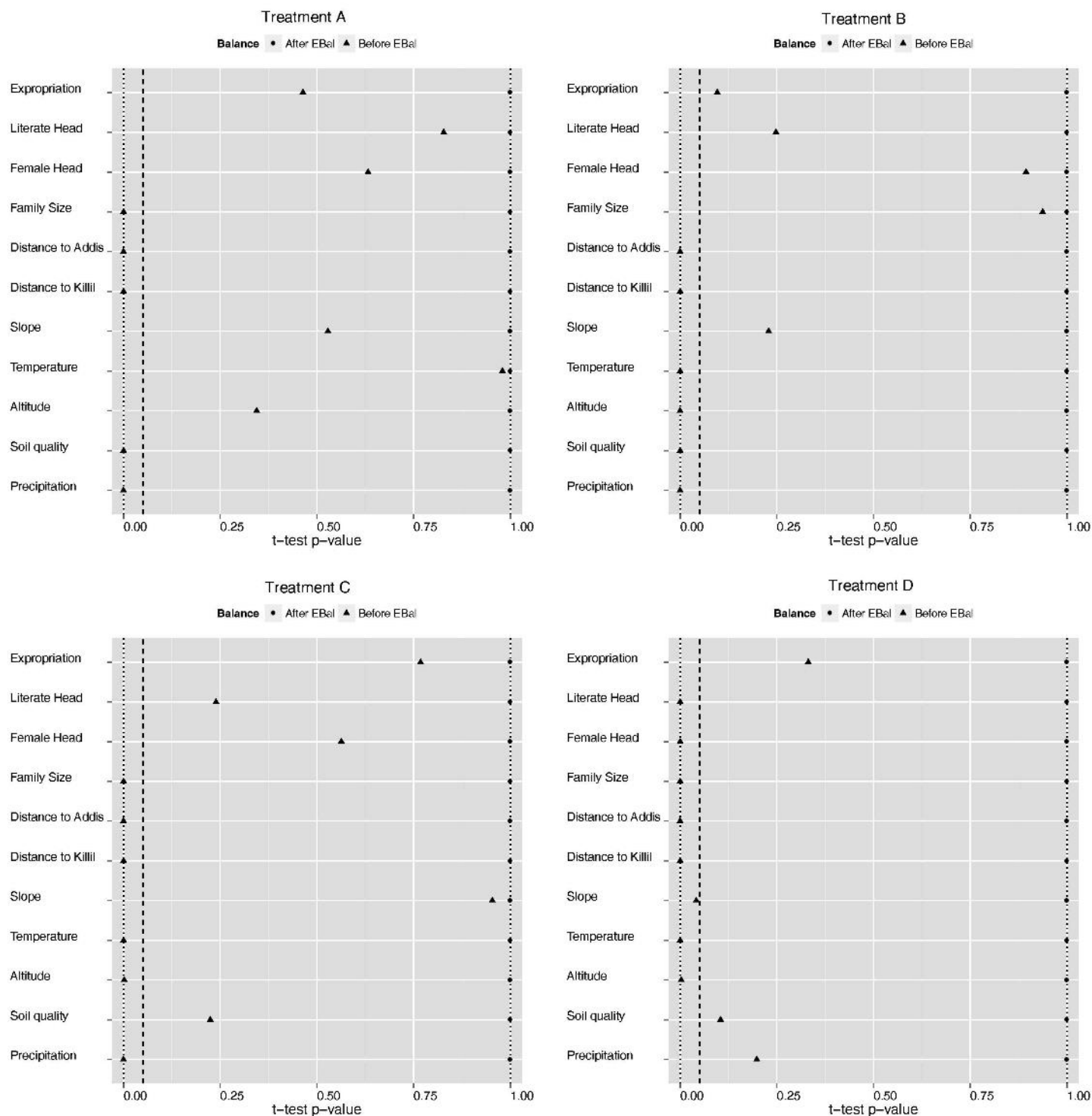


FIGURE 2.10. COVARIATE BALANCE FOR *TENURE_HERITABLE* ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

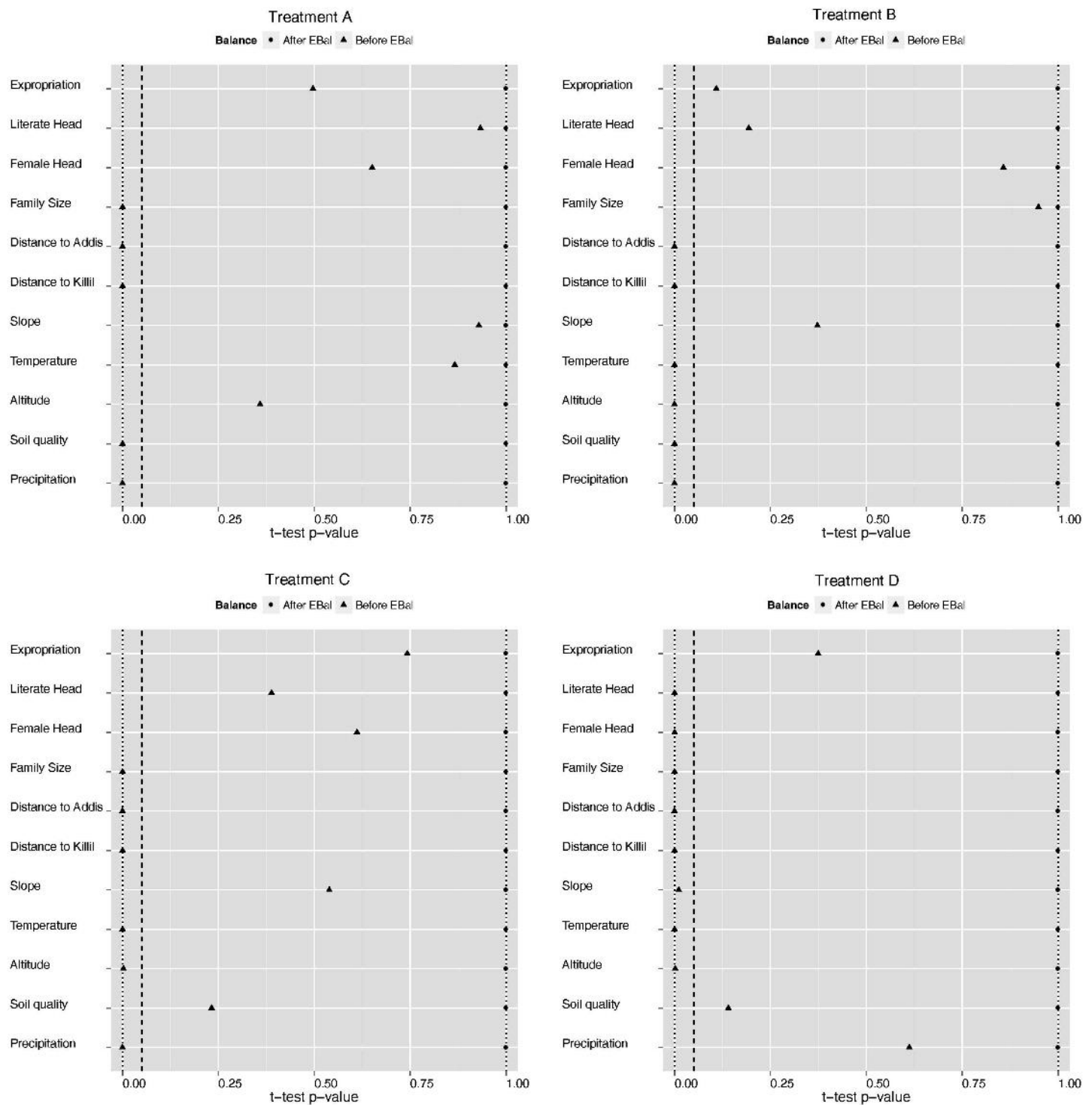


FIGURE 2.11. COVARIATE BALANCE FOR *TENURE_INVESTMENT* ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

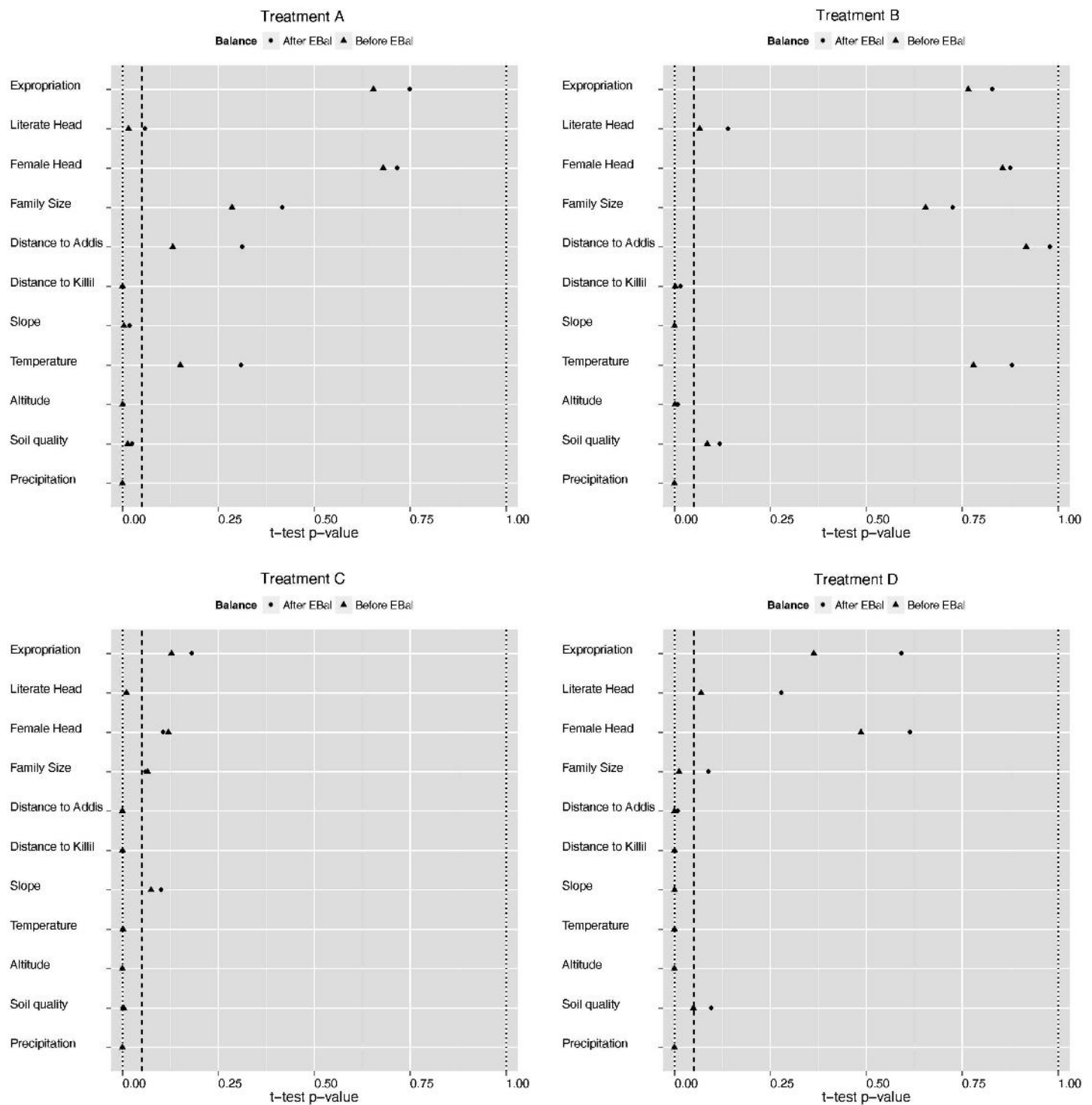


FIGURE 2.12. COVARIATE BALANCE FOR WIFE_DECIDESCROPS ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

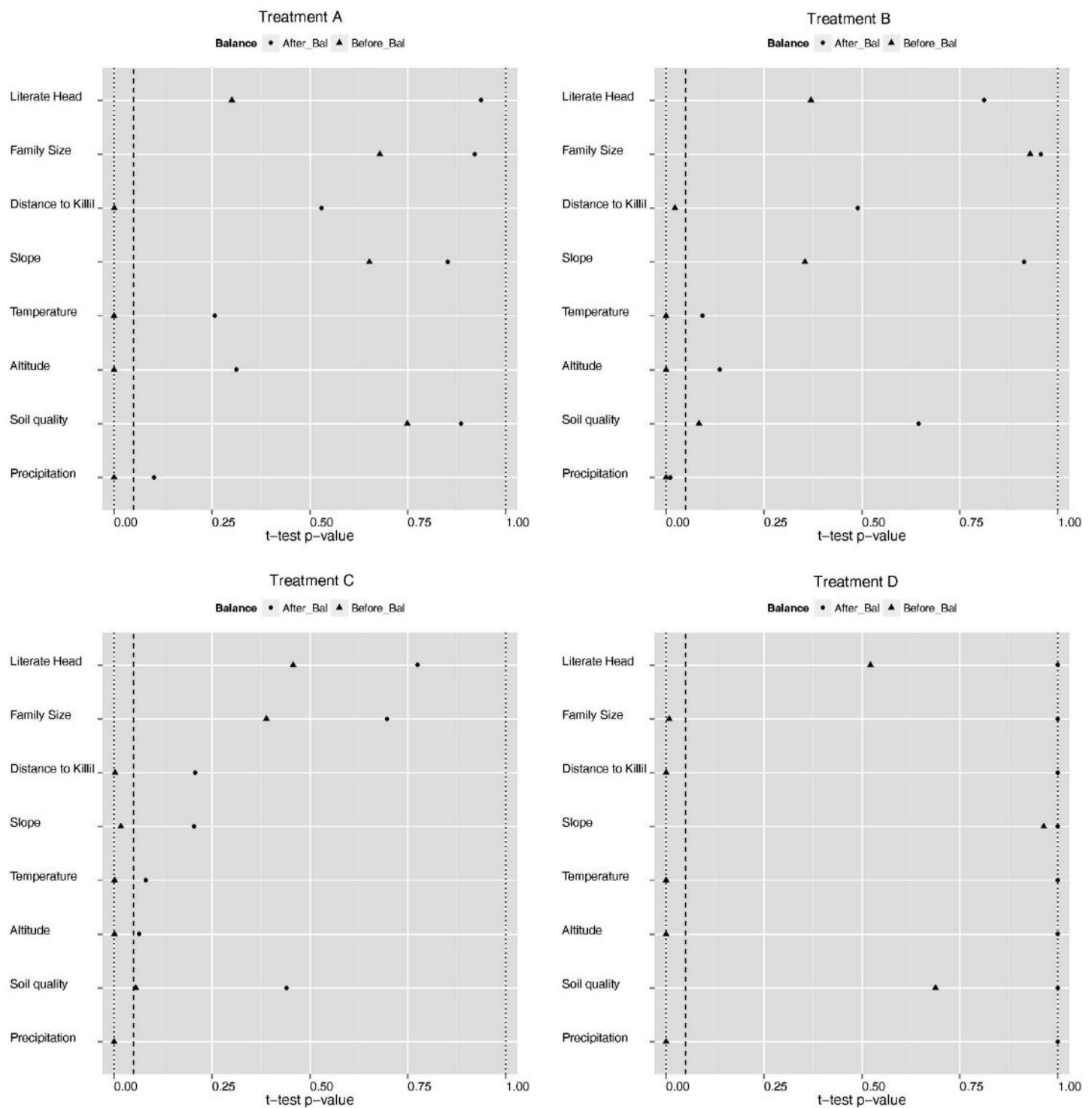


FIGURE 2.13. COVARIATE BALANCE FOR WIFE_HASLAND ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

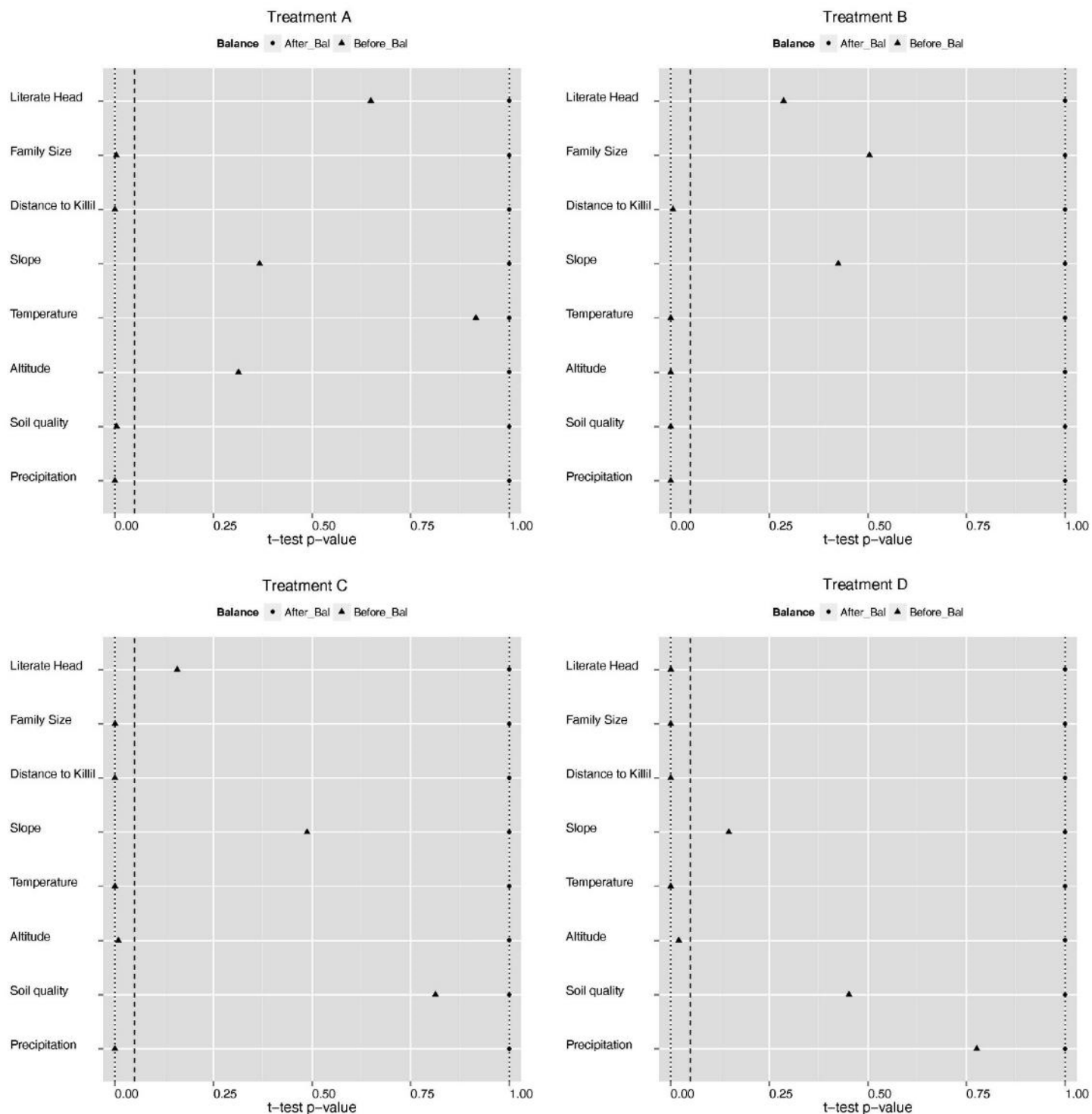


FIGURE 2.14. COVARIATE BALANCE FOR WIFE_LANDCERT ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

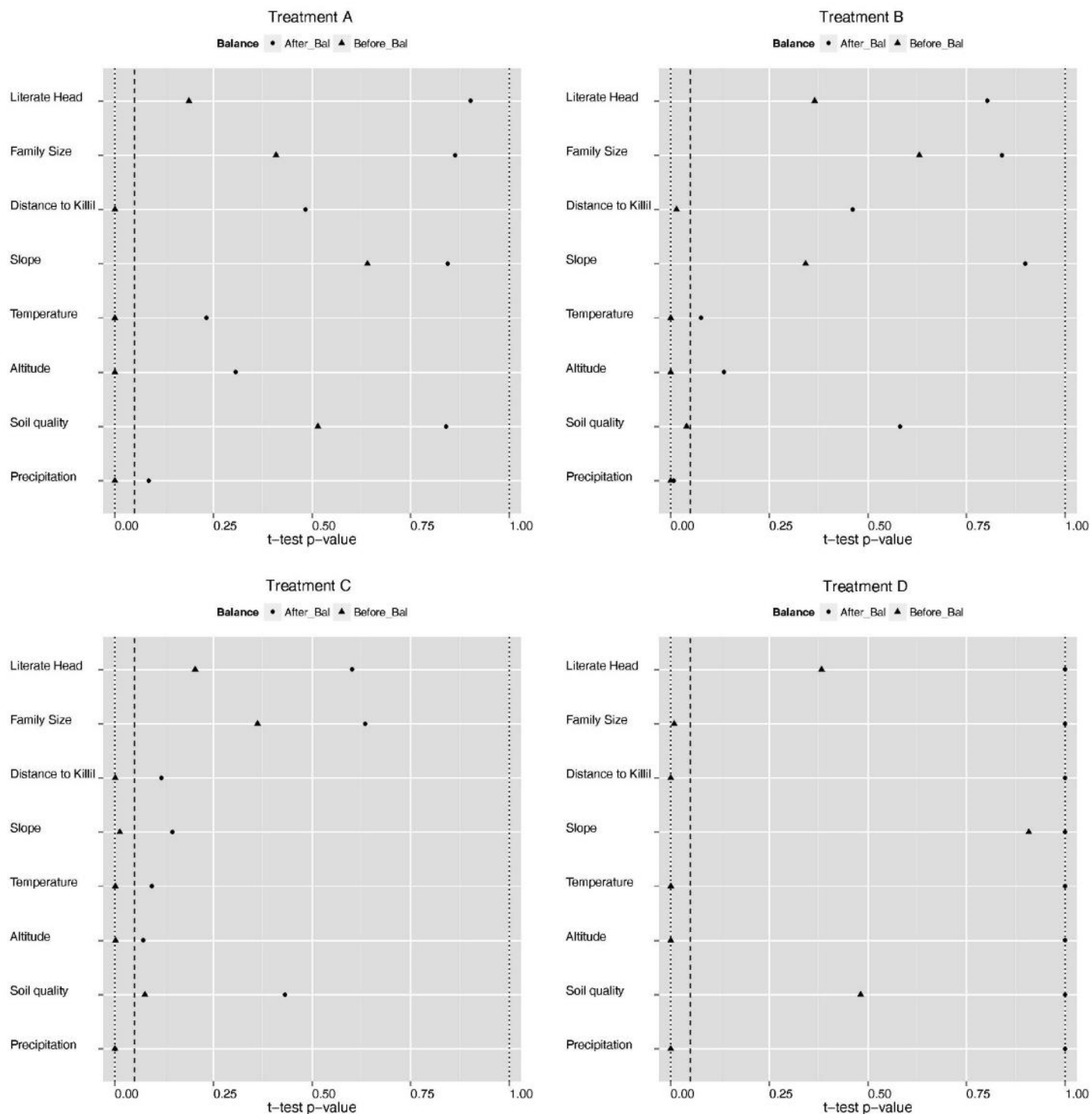


FIGURE 2.15. COVARIATE BALANCE FOR WIFE_TOTALAREA ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

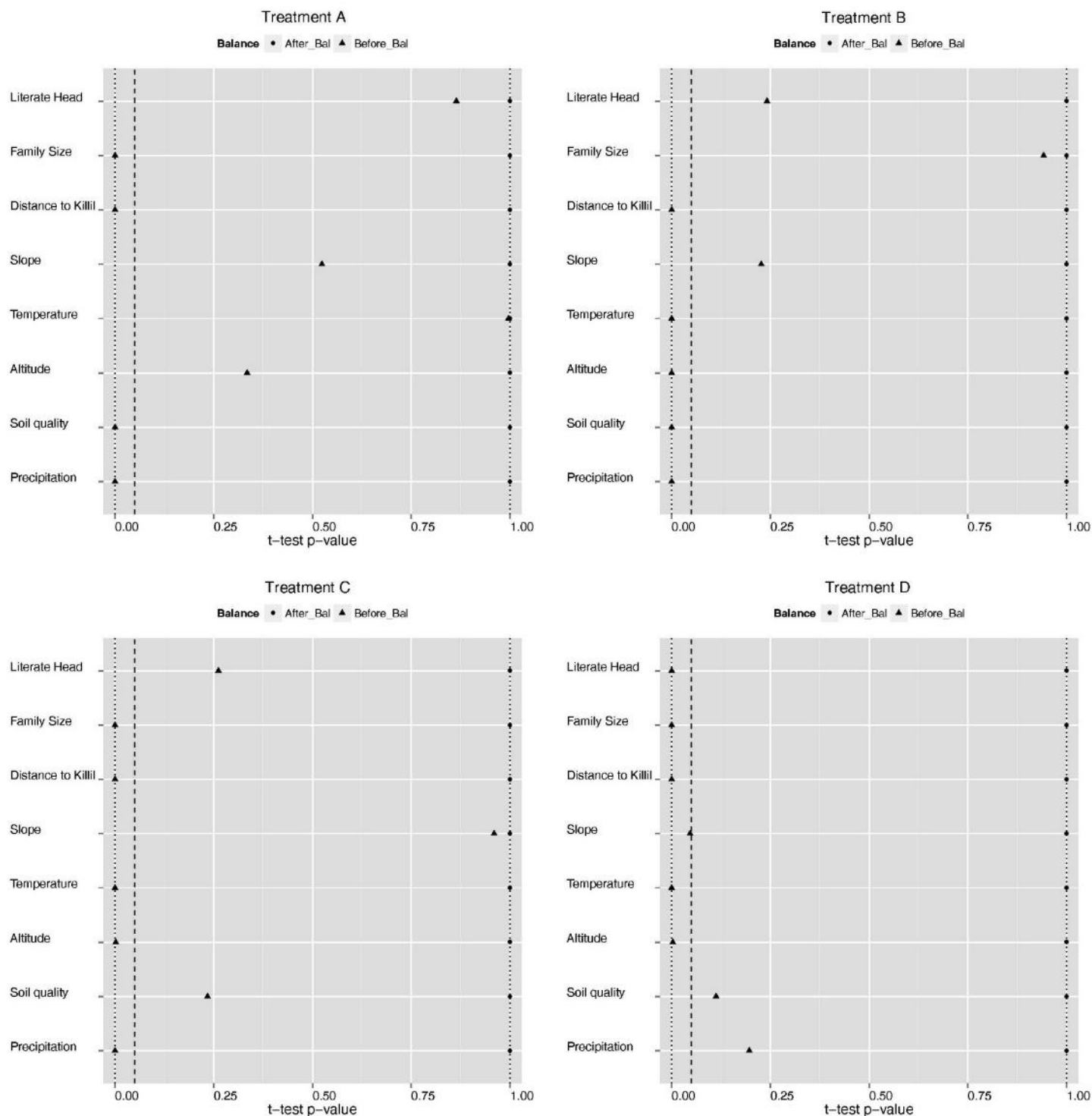


FIGURE 2.16. COVARIATE BALANCE FOR WIFE_TOTALPARCELS ACROSS TREATMENT AND CONTROL GROUPS, BEFORE AND AFTER ENTROPY BALANCING

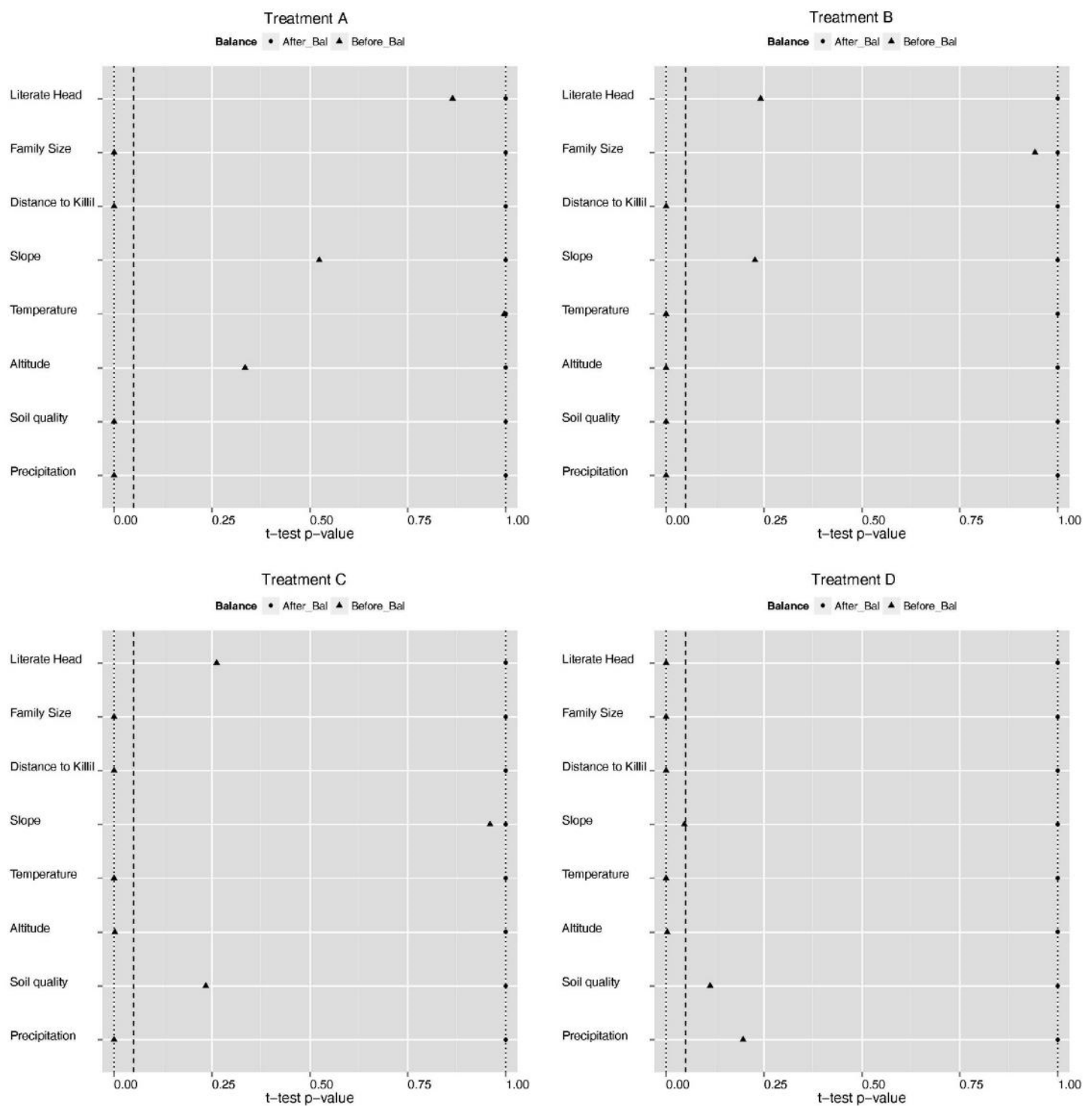


FIGURE 2.17. MAP OF TREATMENT AND CONTROL SITES: TREATMENT A

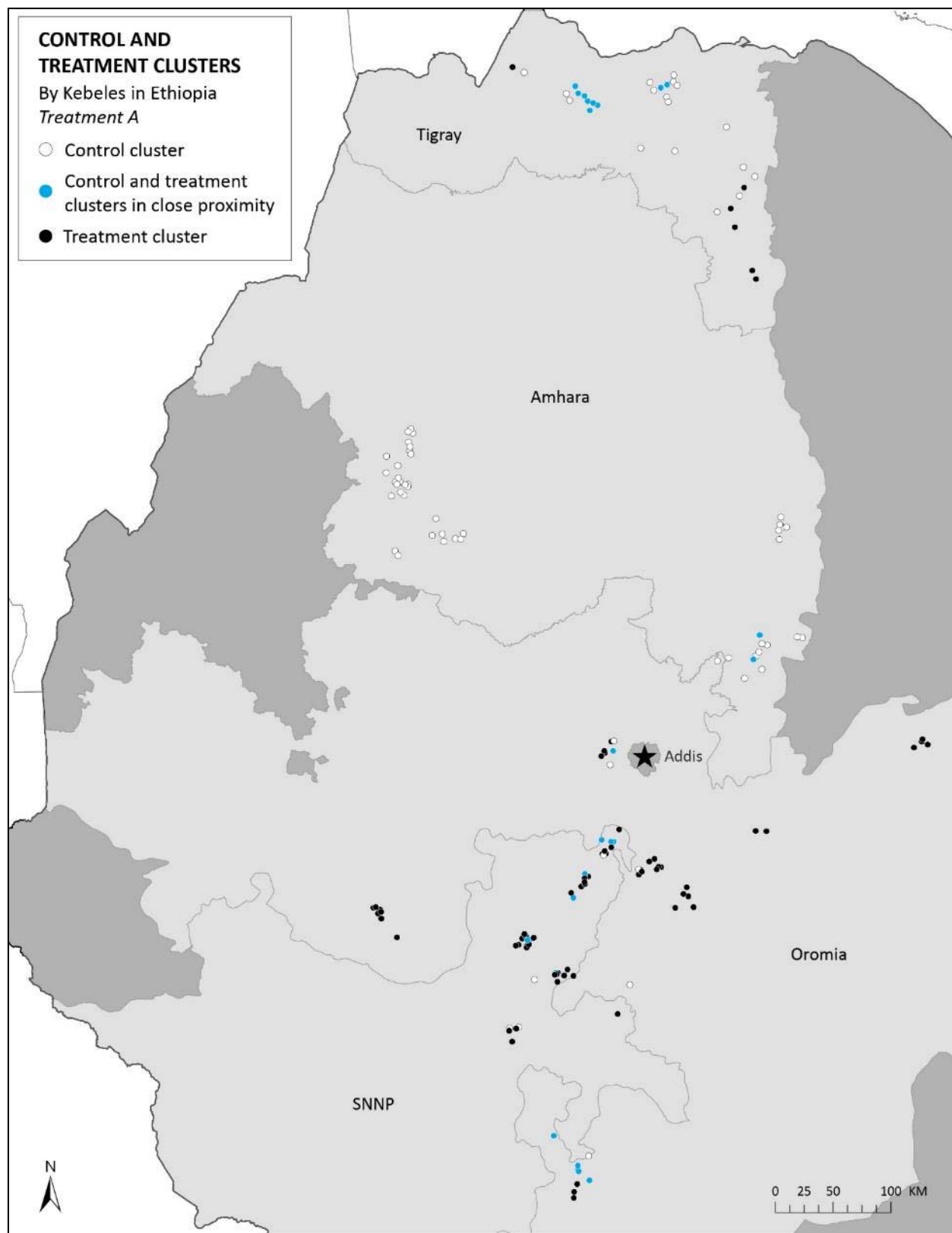


FIGURE 2.18. MAP OF TREATMENT AND CONTROL SITES: TREATMENT B

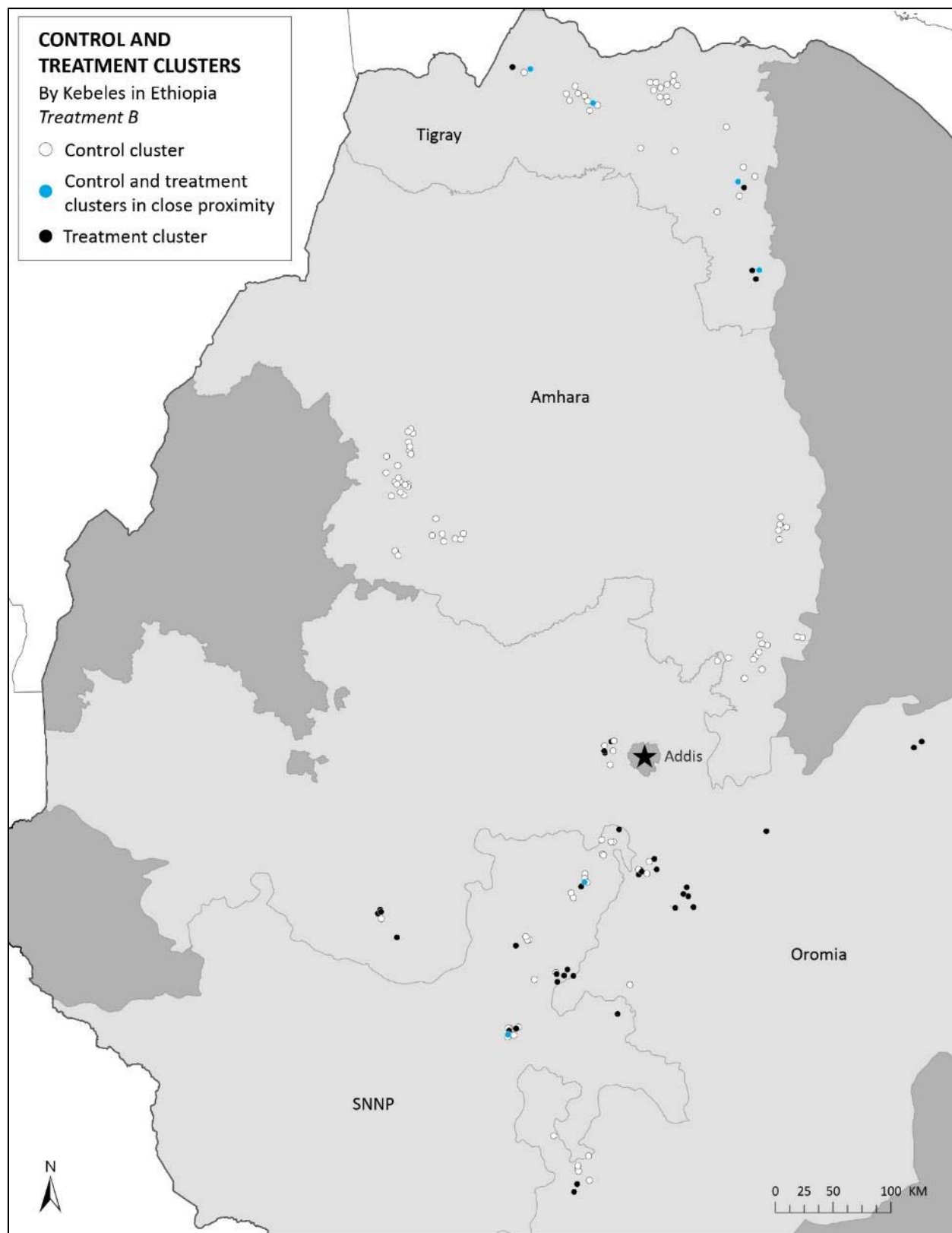


FIGURE 2.19. MAP OF TREATMENT AND CONTROL SITES: TREATMENT C

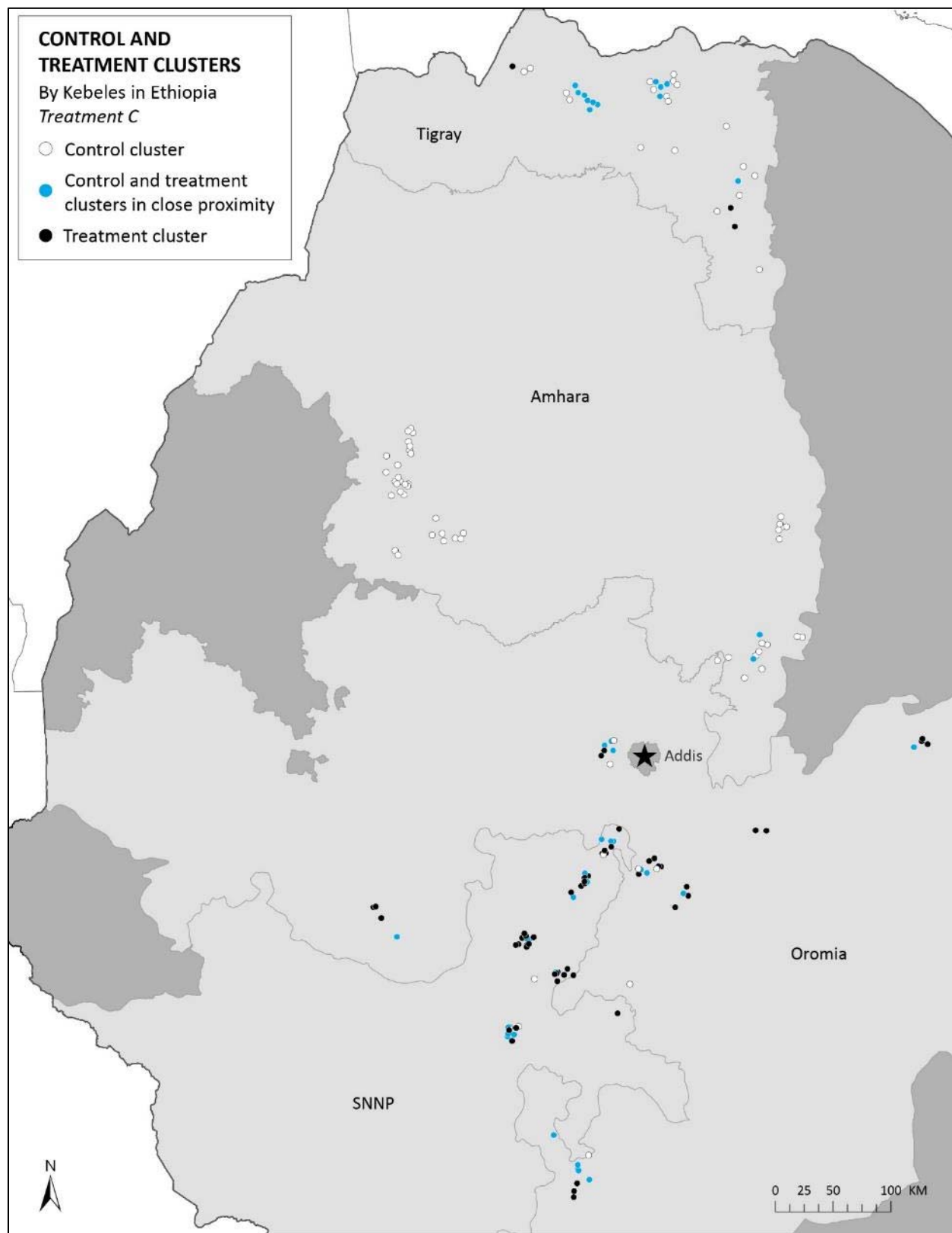


FIGURE 2.20. MAP OF TREATMENT AND CONTROL SITES: TREATMENT D

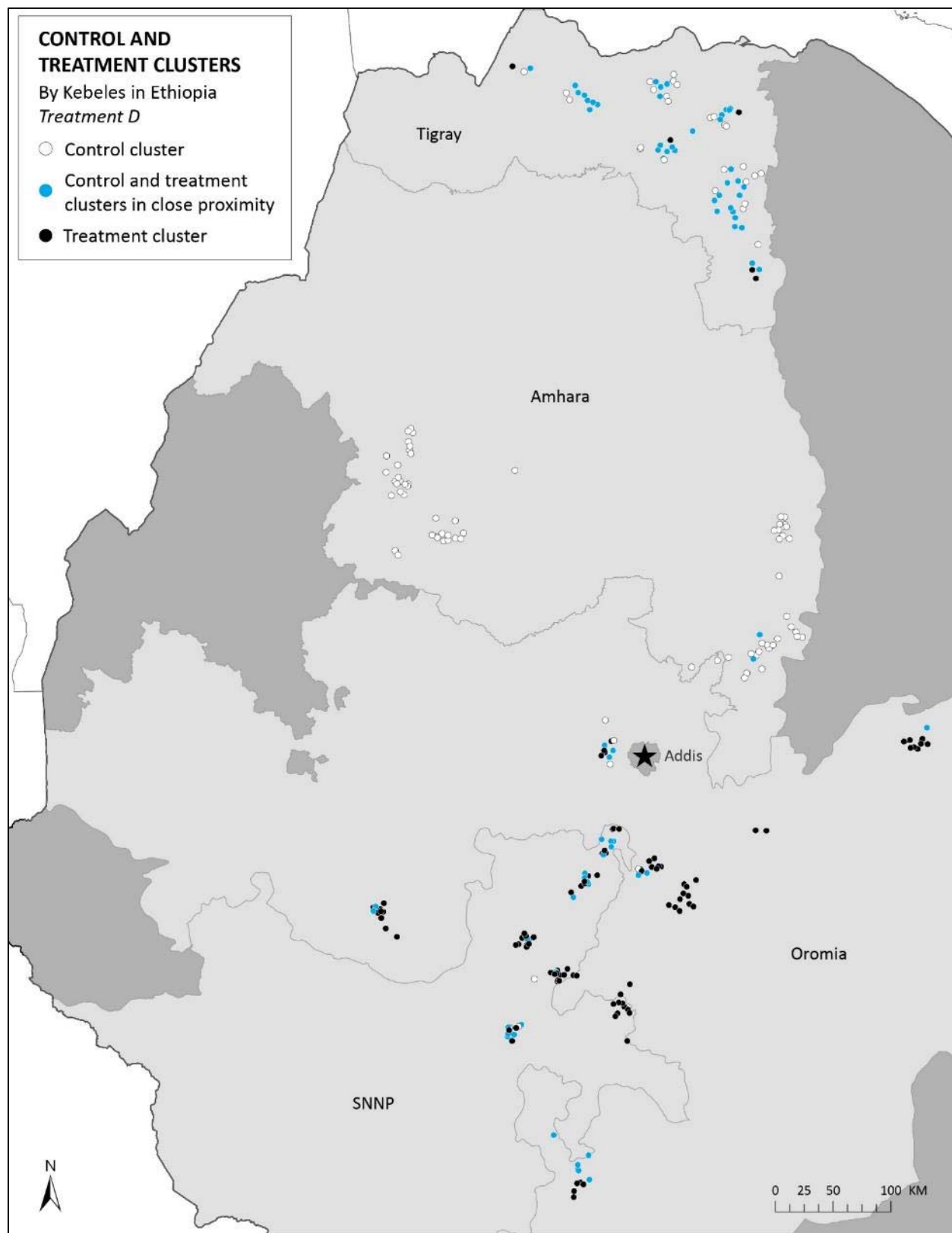


TABLE 2.1. KEY INDICATOR, OUTCOME VARIABLE AND TREATMENT DEFINITIONS

Variable name	Definition	Variable construction notes
credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	Log of (<i>bcreditamt</i> + 1)
credit_farm	Household took any credit for farming purposes in past year (Yes/No)	Renamed from: <i>tookfarmcred</i>
credit_collat	Household formally or informally used land as collateral to obtain credit (Yes/No)	Renamed from: <i>bcreditcoll</i> (Notes: ELAP households only)
dispute_resolve_time	Average time to resolve a land dispute in months	Log of (<i>resolve_time</i>)
dispute_boundary	Household experienced conflicting land claim related to boundaries or encroachment	Renamed from: <i>H2bd</i>
rental_hectares	Total area of land the household rented out, in hectares	Renamed from: <i>blandoutsize</i> (Notes: Households which did not rent out any land (for which <i>rentout</i> =0) receive a value of 0.
rental_plots	Total number of plots the household rented out on a monetary basis	Renamed from: <i>brentoutnum</i> (Notes: Households which did not rent out any land (for which <i>rentout</i> =0) receive a value of 0.
swc_invested	Household invested in any soil or water conservation measures (Yes/No)	Renamed from: <i>H6EA</i>
tenure_heritable	Household believes it has heritable right to bequeath land (Yes/No)	Renamed from: <i>btype_rightc</i>
tenure_redist	Household believes land redistribution in kebele is likely (Yes/No)	Renamed from: <i>redist_risk</i> (Notes: recoded from 4-point scale to 0/1)
tenure_business	Household feels more secure in credit-based business transactions w/ land certificate holder (Yes/No)	Renamed from: <i>certbiz_risk</i> (Notes: recoded from 4-point scale to 0/1)
tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes/No)	Renamed from: <i>certimp_Indinv</i> (Notes: ELAP households only)
wife_hasland	Wife possesses land in her name (Yes/No)	Renamed from: <i>w1_possland</i>
wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	Renamed from: <i>w1_posscert</i>
wife_decidescrops	Wife decides what crops to grow on land in her possession (Yes/No)	Renamed from: <i>decidegrow</i>
wife_rentout	Wife can rent out land in her possession at her discretion (Yes/No)	Renamed from: <i>w1_rentout</i>
wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	Sum of: <i>no_wife_poss</i> + <i>joint_poss</i>
wife_wifeparcels	Number of parcels possessed by wife only	Renamed from: <i>no_wife_poss</i>
wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	Sum of: <i>area_wife_poss</i> + <i>joint_poss_area</i>
wife_wifarea	Area of land in hectares possessed by wife only	Renamed from: <i>area_wife_poss</i>

**TABLE 2.1. KEY INDICATOR, OUTCOME VARIABLE AND TREATMENT DEFINITIONS
(CONTINUED)**

Variable name	Definition	Variable construction notes
treat_a	Binary indicator for Treatment A. Full or partial second-level certification relative to first-level certification. Assesses the marginal impact of second-level certification over 1 st level, for households that were surveyed only, or surveyed and certified, under the second-level (includes households that received only part of the intended second-level process)	treat_a_invariant = 0 if certification at baseline and endline reported as first-level certification. treat_a_invariant = 1 if certification at baseline reported as first-level certification, and certification at endline reported as second-level certification or surveyed for second-level certification. (Notes: time varying treatment variable <i>treat_a</i> created as: treat_a_invariant*time)
treat_b	Binary indicator for Treatment B. Full second-level certification relative to first-level certification. Assesses the marginal impact of second-level certification over first-level (excludes households that received only part of the intended second-level process)	treat_b_invariant = 0 if certification at baseline and endline reported as first-level certification. treat_b_invariant = 1 if certification at baseline reported as first-level certification, and certification at endline reported as second-level certification. (Notes: time varying treatment variable <i>treat_b</i> created as: treat_b_invariant*time)
treat_c	Binary indicator for Treatment C. Partial second-level certification relative to first-level certification. Assesses the marginal impact of land surveyed under second-level certification over first-level certification.	treat_c_invariant = 0 if certification at baseline and endline reported as first-level certification. treat_c_invariant = 1 if certification at baseline reported as first-level certification, and certification at endline reported as surveyed for second-level certification. (Notes: time varying treatment variable <i>treat_c</i> created as: treat_c_invariant*time)
treat_d	Binary indicator for Treatment D. Full or partial second-level certification relative to no or first-level certification.	treat_d_invariant = 0 if certification at baseline and endline reported as either no first-level certification for any parcels, or at least one parcel with first-level certification. treat_d_invariant = 1 if certification at baseline reported as either no certification or first-level certification, and certification at endline reported as second-level certification or surveyed for second-level certification. (Notes: time varying treatment variable <i>treat_d</i> created as: treat_d_invariant*time)
score_nolivestock	Asset-based wealth index at baseline, drawing on 10 binary durable household assets, landholding and roof construction.	the first principal component score for a pca run across: <i>areaowned</i> <i>ironroof</i> <i>mobile</i> <i>taperecl</i> <i>radio</i> <i>sofa</i> <i>barrell</i> <i>cart</i> <i>plow</i> <i>jewelry</i> <i>townhouse</i> (Notes: Livestock data excluded due to high level of missingness. Durable assets held by <3% of households dropped from potential inclusion, as was a combined motorbike and bicycle indicator collected at baseline.)
youth	Indicator for youth-headed household, defined as household head aged 35 or younger at baseline.	Indicator derived from baseline household head age, contained in <i>bagehead</i>

ANNEX III—SUPPLEMENTAL DATA

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TABLE 3.1. ATTs by Outcome Family

Outcome Family Variable			Treatment A				Treatment B				Treatment C				Treatment D				
			Full or partial 2nd level certification				Full 2nd level (survey & certificate only)				Partial 2nd level (survey only)				Full or Partial 2nd vs no or 1st level				
			Treated	Control			Treated	Control			Treated	Control			Treated	Control			
FE	WFE	HH N	HH N	FE	WFE	HH N	HH N	FE	WFE	HH N	HH N	FE	WFE	HH N	HH N	FE	WFE	HH N	HH N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.20*** (0.350)	0.72** (0.338)	441	1447	0.94** (0.430)	0.41 (0.546)	173	1179	1.37*** (0.380)	0.92** (0.408)	269	1275	0.94*** (0.245)	0.89*** (0.238)	919	2980	
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.17*** (0.148)	0.10** (0.047)	882	2894	0.13** (0.0603)	0.05 (0.0763)	345	2357	0.19*** (0.053)	0.13** (0.057)	537	2549	0.13*** (0.035)	0.13*** (0.036)	1838	5960	
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	-0.02*** (0.051)	-0.13*** (0.048)	246	532	0.01 (0.042)	0.00 (0.032)	182	468	-0.09 (0.079)	-0.19** (0.091)	64	350	-0.02 (0.038)	-0.06* (0.0345)	324	726	
	dispute_resolve_time	Average time to resolve a land dispute in months	-0.35 (2.830)	-1.01 (4.327)	11	244	-1.44 (3.113)	-2.68 (6.386)	4	190	0.27 (2.885)	0.28 (6.605)	7	207	-0.63 (1.989)	-0.61 (2.123)	23	443	
Land disputes	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	-0.01 (0.026)	0.03 (0.026)	882	2894	-0.01 (0.031)	0.05 (0.039)	345	2357	0.00 (0.032)	0.03 (0.035)	537	2549	0.00 (0.017)	0.01 (0.018)	1838	5960	
	rental_hectares	Total area of land the HH rented out, in hectares	0.08* (0.042)	0.01 (0.044)	870	2856	0.12** (0.059)	0.07 (0.074)	342	2328	0.05 (0.045)	-0.01 (0.052)	528	2514	0.00 (0.035)	-0.01 (0.034)	1817	5881	
Land rental activity	rental_plots	Total number of plots the HH rented out on a monetary basis	0.03 (0.071)	-0.05 (0.071)	870	2856	0.04 (0.088)	0.02 (0.108)	342	2328	0.02 (0.081)	-0.05 (0.093)	528	2514	-0.04 (0.050)	-0.03 (0.050)	1817	5881	
	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	-0.03 (0.049)	0.01 (0.051)	882	2894	0.01 (0.063)	-0.02 (0.080)	345	2357	-0.05 (0.055)	0.00 (0.062)	537	2549	-0.02 (0.033)	0.04 (0.033)	1838	5960	
Soil & water investments	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.10 (0.068)	-0.02 (0.066)	869	2813	0.02 (0.100)	-0.09 (0.111)	342	2286	0.14** (0.073)	0.02 (0.076)	527	2471	0.13*** (0.048)	0.11** (0.049)	1819	5821	
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.09* (0.049)	0.00 (0.045)	880	2892	0.12 (0.060)	-0.02 (0.074)	345	2357	0.07 (0.054)	-0.01 (0.053)	535	2547	0.05 (0.033)	0.02 (0.031)	1836	5958	
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	-0.02 (0.038)	0.00 (0.037)	881	2891	0.03 (0.052)	0.10* (0.056)	345	2355	-0.05 (0.039)	-0.04 (0.045)	536	2546	0.05 (0.032)	0.07** (0.031)	1835	5955	
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.01 (0.047)	0.01 (0.040)	246	532	0.03 (0.042)	0.03 (0.035)	182	468	-0.04 (0.092)	-0.05 (0.097)	64	350	-0.01 (0.059)	-0.13*** (0.050)	291	689	
	wife-hasland	Wife possesses land in her name (Yes / No)	0.02 (0.089)	-0.03 (0.094)	574	2080	-0.15 (0.107)	-0.22 (0.139)	219	1661	0.13 (0.100)	0.09 (0.114)	355	1827	0.08 (0.053)	0.11** (0.054)	1267	4301	
Female empowerment & decision-making over land	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	-0.09 (0.081)	-0.21*** (0.063)	154	565	-0.03 (0.092)	-0.20*** (0.076)	96	500	-0.18** (0.087)	0.05 (0.124)	58	458	0.03 (0.110)	0.07 (0.110)	208	837	
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	-0.25*** (0.113)	0.44** (0.108)	156	575	-0.21 (0.132)	0.48*** (0.146)	97	508	-0.33*** (0.112)	-0.34* (0.193)	59	468	-0.18** (0.087)	-0.04 (0.106)	217	901	
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.02 (0.100)	0.04 (0.073)	155	581	0.08 (0.112)	0.17 (0.115)	98	517	-0.09 (0.112)	0.22 (0.142)	57	472	-0.03 (0.085)	0.11 (0.081)	216	906	
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	-0.13 (0.244)	0.00 (0.230)	882	2894	0.14 (0.315)	0.34 (0.357)	345	2357	-0.31 (0.271)	-0.19 (0.283)	537	2549	-0.04 (0.173)	-0.04 (0.173)	1838	5960	
	wife_wifeparcels	Number of parcels possessed by wife only	0.00 (0.085)	-0.03 (0.083)	882	2894	0.04 (0.111)	0.02* (0.131)	345	2357	-0.03 (0.091)	-0.03 (0.106)	537	2549	-0.09 (0.059)	-0.06 (0.057)	1838	5960	
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.09 (0.145)	0.21 (0.137)	882	2894	0.21 (0.172)	0.32* (0.194)	345	2357	0.01 (0.179)	0.13 (0.176)	537	2549	0.08 (0.163)	0.03 (0.167)	1838	5960	
	wife_wifarea	Area of land in hectares possessed by wife only	0.03 (0.037)	0.04 (0.037)	882	2894	0.09 (0.060)	0.12 (0.067)	345	2357	-0.01 (0.038)	0.00 (0.042)	537	2549	-0.02 (0.030)	-0.03 (0.030)	1838	5960	

Significance reported as: * $\alpha < 0.10$; ** $\alpha < 0.05$; and *** $\alpha < 0.01$

BOLD results retain their significance even after using a conservation false discovery rate approach to correct p-values for multiple hypothesis testing.

FE = Fixed effects difference-in-difference; WFE = entropy-weighted fixed effects difference-in-difference

TABLE 3.2. ATTs by Outcome Family: FHH Subgroup

Outcome Family Variable	Label	Treatment A				Treatment B				Treatment C				Treatment D			
		Full or partial 2nd level certification				Full 2nd level (survey & certificate only)				Partial 2nd level (survey only)				Full or Partial 2nd vs no or 1st level			
		FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N
Access to credit	credit_amt	0.39	0.22	185	623	0.31	0.07	74	512	0.45	0.34	111	549	0.30	0.23	346	1318
	year in logged Birr	(0.428)	(0.424)			(0.552)	(0.671)			(0.506)	(0.550)			(0.280)	(0.299)		
Access to credit	credit_farm	0.04	0.02	185	623	0.03	0.00	74	512	0.05	0.05	111	549	0.03	0.03	346	1318
	Household took any credit for farming purposes in past year (Yes/No)	(0.061)	(0.061)			(0.078)	(0.096)			(0.072)	(0.079)			(0.040)	(0.045)		
Land disputes	dispute_boundary	0.03	0.03	185	623	0.01	0.01	74	512	0.03	0.05	111	549	0.06	0.06*	346	1318
	HH experienced conflicting land claim related to boundaries or encroachment	(0.052)	(0.046)			(0.058)	(0.061)			(0.061)	(0.065)			(0.036)	(0.036)		
Land rental activity	rental_hectares	0.08	0.07	184	616	0.06	0.13	74	506	0.09	0.06	110	542	0.01	-0.07	344	1300
	Total area of land the HH rented out, in hectares	(0.088)	(0.082)			(0.113)	(0.144)			(0.098)	(0.097)			(0.060)	(0.068)		
Land rental activity	rental_plots	-0.10	0.14	184	616	-0.06	0.31	74	506	-0.13	0.06	110	542	-0.13	-0.12	344	1300
	Total number of plots the HH rented out on a monetary basis	(0.210)	(0.171)			(0.258)	(0.282)			(0.228)	(0.223)			(0.138)	(0.145)		
Soil & water investments	swc_invested	-0.04	0.03	185	623	-0.05	-0.05	74	512	-0.04	0.09	111	549	-0.05	0.10	346	1318
	HH invested in any soil or water conservation measures (Yes / No)	(0.101)	(0.109)			(0.112)	(0.144)			(0.129)	(0.151)			(0.063)	(0.071)		
Land tenure security	tenure_business	0.02	0.11**	184	616	0.09	0.24***	74	506	-0.03	0.03	110	542	0.08*	0.11**	344	1300
	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	(0.058)	(0.054)			(0.079)	(0.086)			(0.064)	(0.064)			(0.047)	(0.049)		
	tenure_heritable	0.10	0.06	182	606	0.03	0.04	73	497	0.14	0.08	109	533	0.09	0.10	343	1289
	HH believes it has heritable right to bequeath land (Yes / No)	(0.088)	(0.085)			(0.133)	(0.152)			(0.095)	(0.097)			(0.058)	(0.063)		
Land tenure security	tenure_redist	0.08	-0.01	183	621	0.16	0.00	74	512	0.04	-0.04	109	547	0.04	0.07	344	1316
	HH believes land redistribution in kebele is likely (Yes / No)	(0.080)	(0.079)			(0.096)	(0.116)			(0.092)	(0.101)			(0.052)	(0.052)		

Significance reported as: * $\alpha < 0.10$; ** $\alpha < 0.05$; and *** $\alpha < 0.01$

BOLD results retain their significance even after using a conservation false discovery rate approach to correct p-values for multiple hypothesis testing.

FE = Fixed effects difference-in-difference; WFE = entropy-weighted fixed effects difference-in-difference

TABLE 3.3. ATTs by Outcome Family: MHH Subgroup

Outcome Family Variable	Label	Treatment A				Treatment B				Treatment C				Treatment D			
		Full or partial 2nd level certification				Full 2nd level (survey & certificate only)				Partial 2nd level (survey only)				Full or Partial 2nd vs no or 1st level			
		FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N
Access to credit	credit_amt	1.43***	0.86**	697	2271	1.12**	0.26	271	1845	1.63***	1.10**	426	2000	1.13***	1.04***	1491	4642
	year in logged Birr	(0.381)	(0.370)			(0.483)	(0.605)			(0.414)	(0.445)			(0.277)	(0.261)		
Access to credit	credit_farm	0.20***	0.12**	697	2271	0.16**	0.03	271	1845	0.23***	0.16**	426	2000	0.16***	0.15***	1491	4642
	Household took any credit for farming purposes in past year (Yes/No)	(0.053)	(0.052)			(0.068)	(0.085)			(0.058)	(0.063)			(0.040)	(0.040)		
Land disputes	dispute_boundary	0.03	-0.01	697	2271	-0.02	0.08	271	1845	0.03	-0.01	426	2000	0.00	-0.02	1491	4642
	HH experienced conflicting land claim related to boundaries or encroachment	(0.030)	(0.027)			(0.033)	(0.051)			(0.038)	(0.033)			(0.019)	(0.017)		
Land rental activity	rental_hectares	-0.01*	0.08	686	2240	0.04**	0.14	268	1822	0.04	-0.03	418	1972	0.00	0.01	1472	4581
	Total area of land the HH rented out, in hectares	(0.048)	(0.045)			(0.079)	(0.066)			(0.048)	(0.055)			(0.038)	(0.039)		
Land rental activity	rental_plots	-0.08	0.07	686	2240	-0.08	0.07	268	1822	0.07	-0.05	418	1972	0.01	-0.03	1472	4581
	Total number of plots the HH rented out on a monetary basis	(0.071)	(0.069)			(0.098)	(0.080)			(0.082)	(0.095)			(0.047)	(0.045)		
Soil & water investments	swc_invested	-0.02	0.00	697	2271	0.02	0.02	271	1845	-0.02	-0.06	426	2000	0.03	-0.02	1491	4642
	HH invested in any soil or water conservation measures (Yes / No)	(0.050)	(0.050)			(0.068)	(0.085)			(0.059)	(0.054)			(0.034)	(0.035)		
Land tenure security	tenure_business	-0.03	-0.03	697	2271	0.01	0.01	271	1845	-0.05	-0.05	426	2000	0.05	0.04	1491	4642
	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	(0.040)	(0.041)			(0.059)	(0.056)			(0.041)	(0.049)			(0.033)	(0.035)		
	tenure_heritable	0.10	-0.05	687	2207	-0.17	0.02	269	1789	0.15*	0.00	418	1938	0.12***	0.14**	1475	4532
	HH believes it has heritable right to bequeath land (Yes / No)	(0.071)	(0.070)			(0.112)	(0.101)			(0.078)	(0.082)			(0.051)	(0.051)		
Land tenure security	tenure_redist	0.09*	0.01	697	2271	0.11*	0.01	271	1845	0.08	0.00	426	2000	0.02	0.05	1491	4642
	HH believes land redistribution in kebele is likely (Yes / No)	(0.052)	(0.049)			(0.064)	(0.081)			(0.058)	(0.058)			(0.034)	(0.036)		

Significance reported as: * $\alpha < 0.10$; ** $\alpha < 0.05$; and *** $\alpha < 0.01$

BOLD results retain their significance even after using a conservation false discovery rate approach to correct p-values for multiple hypothesis testing.

FE = Fixed effects difference-in-difference; WFE = entropy-weighted fixed effects difference-in-difference

TABLE 3.4. Subgroup Comparison: FHH v. MHH

		Treatment A				Treatment B				Treatment C				Treatment D			
		Full or partial 2nd level certification				Full 2nd level (survey & certificate only)				Partial 2nd level (survey only)				Full or Partial 2nd vs no or 1st level			
		FE		WFE		FE		WFE		FE		WFE		FE		WFE	
Outcome Family Variable	Label	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score
Access to credit	credit_amt	-1.036	-5.320	-0.636	-3.075	-0.813	-3.041	-0.184	-0.634	-1.176	-4.044	-0.761	-2.355	-0.833	-20.603	-0.808	-5.515
	credit_farm	-0.161	-5.109	-0.098	-3.046	-0.135	-3.429	-0.039	-0.854	-0.176	-4.010	-0.111	-2.303	-0.131	-38.272	-0.120	-5.760
Land disputes	dispute_boundary	-0.008	-0.223	0.038	0.861	0.032	0.677	-0.072	-2.234	0.022	0.409	0.042	0.823	0.064	2.049	0.073	2.292
Land rental activity	rental_hectares	0.079	1.188	0.001	0.007	0.088	0.727	-0.078	-0.849	0.052	0.600	0.089	1.108	-0.072	-1.259	0.003	0.059
	rental_plots	0.220	1.412	-0.169	-0.850	0.382	1.446	-0.126	-0.512	-0.198	-0.927	0.108	0.535	-0.136	-1.054	-0.092	-0.663
Soil & water investments	swc_invested	-0.019	-0.215	0.030	0.309	-0.071	-0.794	-0.069	-0.592	0.109	0.785	0.015	0.125	0.068	1.091	-0.032	-0.601
Land tenure security	tenure_business	0.133	3.753	0.044	1.084	0.224	3.585	0.077	1.370	0.021	0.420	0.078	1.842	0.063	1.743	0.043	1.363
	tenure_heritable	0.000	-0.002	0.115	2.385	0.202	1.973	0.012	0.137	-0.006	-0.111	0.077	1.488	-0.016	-0.449	-0.059	-2.065
	tenure_redist	-0.010	-0.159	-0.016	-0.258	0.040	0.550	-0.008	-0.095	-0.044	-0.612	-0.040	-0.482	0.051	1.281	-0.016	-0.433

TABLE 3.5. ATTs by Outcome Family: ELTAP Subgroup

Outcome Family Variable			Treatment A			Treatment B				Treatment C				Treatment D				
			Full or partial 2nd level certification				Full 2nd level (survey & certificate only)				Partial 2nd level (survey only)				Full or Partial 2nd vs no or 1st level			
			FE	WFE	treated HH N	Control HH N	FE	WFE	treated HH N	Control HH N	FE	WFE	treated HH N	Control HH N	FE	WFE	treated HH N	Control HH N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.08** (0.379)	0.60* (0.354)	636	2362	0.64 (0.575)	0.02 (0.719)	163	1889	1.24** (0.387)	0.83** (0.400)	473	2199	0.89*** (0.253)	0.86*** (0.252)	1513	5229
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.15** (0.053)	0.09* (0.051)	636	2362	0.08 (0.081)	0.00 (0.110)	163	1889	0.18*** (0.053)	0.12** (0.056)	473	2199	0.13*** (0.037)	0.13*** (0.039)	1513	5229
	Land disputes	dispute_boundary	Average time to resolve a land dispute in months	-0.01 (0.030)	0.02 (0.031)	636	2362	0.00 (0.035)	0.02 (0.048)	163	1889	-0.01 (0.035)	0.01 (0.038)	473	2199	0.00 (0.018)	0.01 (0.021)	1513
dispute_resolve_time		HH experienced conflicting land claim related to boundaries or encroachment	0.40 (3.277)	0.44 (5.700)	8	177	-1.77 (3.774)	-4.56*** (0.139)	1	128	0.71 (3.101)	1.35 (7.066)	7	165	-0.39 (2.327)	-0.58 (2.007)	20	358
Land rental activity		rental_hectares	Total area of land the HH rented out, in hectares	0.09* (0.049)	0.05 (0.056)	624	2324	0.15 (0.103)	0.18 (0.149)	160	1860	0.06 (0.049)	0.00 (0.054)	464	2164	0.01 (0.039)	0.01 (0.040)	1492
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.05 (0.082)	-0.01 (0.086)	624	2324	0.09 (0.122)	0.03 (0.167)	160	1860	0.04 (0.088)	-0.04 (0.099)	464	2164	-0.03 (0.056)	0.00 (0.056)	1492	5150
	Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	-0.03 (0.057)	0.00 (0.063)	636	2362	0.01 (0.101)	0.02 (0.132)	163	1889	-0.05 (0.060)	-0.01 (0.069)	473	2199	-0.02 (0.036)	0.02 (0.039)	1513
tenure_business		HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	-0.01 (0.043)	-0.02 (0.045)	635	2359	0.10 (0.084)	0.11 (0.094)	163	1887	-0.05 (0.042)	-0.06 (0.048)	472	2196	0.05 (0.036)	0.05 (0.036)	1512	5226
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.17** (0.068)	0.07 (0.071)	624	2324	0.21** (0.097)	0.19 (0.138)	160	1860	0.15** (0.075)	0.03 (0.080)	464	2164	0.17*** (0.046)	0.18*** (0.050)	1492	5150
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.09 (0.055)	0.00 (0.054)	634	2360	0.06 (0.062)	-0.03 (0.092)	163	1889	0.10* (0.060)	0.02 (0.061)	471	2197	0.04 (0.036)	0.01 (0.035)	1511	5227

Significance reported as: * $\alpha < 0.10$; ** $\alpha < 0.05$; and *** $\alpha < 0.01$

BOLD results retain their significance even after using a conservation false discovery rate approach to correct p-values for multiple hypothesis testing.

FE = Fixed effects difference-in-difference; WFE = entropy-weighted fixed effects difference-in-difference

TABLE 3.6. ATTs by Outcome Family: ELAP Subgroup

Outcome Family Variable			Treatment A				Treatment B				Treatment C				Treatment D			
			Full or partial 2nd level certification				Full 2nd level (survey & certificate only)				Partial 2nd level (survey only)				Full or Partial 2nd vs no or 1st level			
			FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N	FE	WFE	Treated HH N	Control HH N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.21	1.43**	246	532	0.78	1.85***	182	468	2.46**	2.54***	64	350	0.92	2.33**	325	731
			(0.900)	(0.587)			(0.890)	(0.481)			(0.850)	(1.146)			(0.805)	(0.473)		
Land disputes	dispute_boundary	Average time to resolve a land dispute in months	0.05	0.02	246	532	0.05	-0.05	182	468	0.05	0.08**	64	350	0.06*	0.11***	325	731
			(0.037)	(0.034)			(0.045)	(0.041)			(0.032)	(0.037)			(0.033)	(0.027)		
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	-0.03	0.02	246	532	-0.03	-0.12	182	468	-0.05	-0.10	64	350	-0.08	-0.23***	325	731
			(0.096)	(0.064)			(0.096)	(0.084)			(0.121)	(0.125)			(0.080)	(0.053)		
	rental_plots	Total number of plots the HH rented out on a monetary basis	-0.04	0.01	246	532	-0.03	-0.20	182	468	-0.05	-0.32	64	350	-0.11	-0.45***	325	731
			(0.142)	(0.109)			(0.152)	(0.147)			(0.213)	(0.218)			(0.116)	(0.089)		
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	-0.07	-0.16**	246	532	-0.07	-0.43***	182	468	-0.07	0.05	64	350	-0.07	-0.16*	325	731
			(0.135)	(0.076)			(0.137)	(0.084)			(0.136)	(0.110)			(0.101)	(0.079)		
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.03	0.14**	246	532	0.06	0.14***	182	468	-0.06	0.02	64	350	0.07	0.10	325	731
			(0.052)	(0.056)			(0.050)	(0.053)			(0.062)	(0.084)			(0.055)	(0.061)		
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.00	0.02	245	531	-0.02	0.10	181	467	0.06	0.26*	64	350	0.04	-0.18**	324	730
			(0.142)	(0.092)			(0.152)	(0.103)			(0.138)	(0.148)			(0.118)	(0.078)		
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	-0.02	-0.09	246	532	0.01	-0.10	182	468	-0.10	-0.14*	64	350	0.01	0.17***	325	731
			(0.079)	(0.061)			(0.087)	(0.075)			(0.063)	(0.073)			(0.048)	(0.054)		

Significance reported as: * $\alpha < 0.10$; ** $\alpha < 0.05$; and *** $\alpha < 0.01$

BOLD results retain their significance even after using a conservation false discovery rate approach to correct p-values for multiple hypothesis testing.

FE = Fixed effects difference-in-difference; WFE = entropy-weighted fixed effects difference-in-difference

TABLE 3.7. Subgroup Comparison: ELTAP v. ELAP

			Treatment A				Treatment B				Treatment C				Treatment D			
			Full or partial 2nd level certification				Full 2nd level (survey & certificate only)				Partial 2nd level (survey only)				Full or Partial 2nd vs no or 1st level			
			FE		WFE		FE		WFE		FE		WFE		FE		WFE	
Outcome Family Variable	Label		Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score	Difference	Z-score
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	-0.130	-0.159	-0.825	-1.760	-0.139	-0.204	-1.823	-3.415	-1.222	-1.616	-1.707	-1.589	-0.037	-0.049	-1.468	-3.663
Land disputes	dispute_boundary	Average time to resolve a land dispute in months	-0.061	-2.836	-0.005	-0.333	-0.051	-1.772	0.077	3.211	-0.062	-4.631	-0.062	-10.128	-0.061	-2.282	-0.105	-5.909
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.119	1.435	0.030	0.928	0.181	5.053	0.299	2.431	0.110	0.997	0.098	0.872	0.090	1.283	0.236	6.788
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.088	0.763	-0.027	-0.395	0.128	1.415	0.226	2.815	0.082	0.424	0.286	1.476	0.081	0.800	0.447	6.437
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.041	0.331	0.159	3.685	0.084	0.899	0.451	4.395	0.028	0.227	-0.051	-0.600	0.051	0.543	0.177	2.546
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	-0.041	-1.397	-0.159	-4.795	0.039	0.582	-0.035	-0.445	0.014	0.312	-0.082	-1.185	-0.016	-0.390	-0.044	-0.904
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.169	1.354	0.051	0.874	0.237	2.034	0.086	0.947	0.089	0.765	-0.231	-1.856	0.127	1.165	0.355	5.885
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.108	1.921	0.090	3.079	0.051	0.831	0.079	1.485	0.201	9.983	0.160	4.024	0.034	1.068	-0.162	-3.908

TABLE 3.8. Summary Statistics, Outcome Variables

			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.57	2.91	0.00	0	8.99	4326	0.50	1.78	0.00	0	9.58	4326
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.23	0.42	0.00	0	1.00	4326	0.07	0.26	0.00	0	1.00	4326
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.04	0.21	0.00	0	1.00	923	0.05	0.22	0.00	0	1.00	926
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.92	1.25	1.79	0	5.60	468	1.27	1.20	1.10	0	4.09	239
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.07	0.25	0.00	0	1.00	4326	0.06	0.24	0.00	0	1.00	4326
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.12	0.53	0.00	0	25.00	4276	0.21	0.53	0.00	0	9.00	4326
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.62	1.02	0.00	0	8.00	1354	0.45	0.98	0.00	0	10.00	4326
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.60	0.49	1.00	0	1.00	4326	0.74	0.44	1.00	0	1.00	4326
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.43	0.50	0.00	0	1.00	4245	0.96	0.19	1.00	0	1.00	4326
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.24	0.42	0.00	0	1.00	4324	0.15	0.36	0.00	0	1.00	4326
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.86	0.34	1.00	0	1.00	4321	0.95	0.22	1.00	0	1.00	4326
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.90	0.30	1.00	0	1.00	888	0.88	0.32	1.00	0	1.00	926
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.26	0.44	0.00	0	1.00	3325	0.97	0.17	1.00	0	1.00	3110
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.80	0.40	1.00	0	1.00	853	0.51	0.50	1.00	0	1.00	3110
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.78	0.41	1.00	0	1.00	896	0.73	0.45	1.00	0	1.00	3110
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.27	0.45	0.00	0	1.00	894	0.14	0.34	0.00	0	1.00	3110
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	1.68	2.05	1.00	0	14.00	4326	2.54	2.19	2.00	0	22.00	4326
	wife_wifeparcels	Number of parcels possessed by wife only	0.48	1.20	0.00	0	11.00	4326	0.65	1.42	0.00	0	19.00	4326
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.80	1.13	0.50	0	18.00	4326	1.19	1.77	0.88	0	65.77	4326
	wife_wifarea	Area of land in hectares possessed by wife only	0.21	0.58	0.00	0	8.50	4326	0.26	0.66	0.00	0	13.50	4326

TABLE 3.9. Summary Statistics, Outcome Variables Disaggregated by Gender of Household Head (Male)

			Male Headed Households											
			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.67	2.98	0.00	0	8.99	3413	0.54	1.85	0.00	0	9.58	3412
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.25	0.43	0.00	0	1.00	3413	0.08	0.27	0.00	0	1.00	3412
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.05	0.21	0.00	0	1.00	759	0.05	0.22	0.00	0	1.00	762
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.88	1.27	1.79	0	5.56	371	1.28	1.20	1.10	0	4.09	176
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.07	0.25	0.00	0	1.00	3413	0.06	0.24	0.00	0	1.00	3412
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.09	0.55	0.00	0	25.00	3373	0.15	0.47	0.00	0	9.00	3412
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.44	0.90	0.00	0	7.00	1012	0.31	0.79	0.00	0	10.00	3412
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.61	0.49	1.00	0	1.00	3413	0.76	0.43	1.00	0	1.00	3412
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.45	0.50	0.00	0	1.00	3349	0.96	0.19	1.00	0	1.00	3412
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.23	0.42	0.00	0	1.00	3413	0.15	0.35	0.00	0	1.00	3412
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.86	0.34	1.00	0	1.00	3409	0.95	0.21	1.00	0	1.00	3412
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.91	0.28	1.00	0	1.00	730	0.88	0.33	1.00	0	1.00	762
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.27	0.45	0.00	0	1.00	3100	0.97	0.17	1.00	0	1.00	3107
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.80	0.40	1.00	0	1.00	821	0.51	0.50	1.00	0	1.00	3107
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.79	0.41	1.00	0	1.00	861	0.73	0.45	1.00	0	1.00	3107
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.27	0.45	0.00	0	1.00	861	0.14	0.34	0.00	0	1.00	3107
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	1.54	2.07	0.00	0	14.00	3413	2.50	2.27	2.00	0	22.00	3412
	wife_wifeparcels	Number of parcels possessed by wife only	0.12	0.55	0.00	0	8.00	3413	0.13	0.56	0.00	0	7.00	3412
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.75	1.16	0.00	0	18.00	3413	1.22	1.92	0.88	0	65.77	3412
	wife_wifarea	Area of land in hectares possessed by wife only	0.05	0.26	0.00	0	5.00	3413	0.05	0.20	0.00	0	3.00	3412

TABLE 3.10. Summary Statistics, Outcome Variables Disaggregated by Gender of Household Head (Female)

			Female Headed Households											
			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.19	2.61	0.00	0	8.85	913	0.32	1.44	0.00	0	8.01	914
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.18	0.38	0.00	0	1.00	913	0.05	0.22	0.00	0	1.00	914
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.04	0.19	0.00	0	1.00	164	0.05	0.22	0.00	0	1.00	164
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	2.06	1.17	2.08	0	5.60	97	1.23	1.21	0.69	0	3.87	63
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.07	0.25	0.00	0	1.00	913	0.07	0.26	0.00	0	1.00	914
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.25	0.47	0.00	0	3.00	903	0.43	0.67	0.00	0	5.50	914
	rental_plots	Total number of plots the HH rented out on a monetary basis	1.15	1.18	1.00	0	8.00	342	1.00	1.35	0.00	0	9.00	914
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.56	0.50	1.00	0	1.00	913	0.65	0.48	1.00	0	1.00	914
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.38	0.49	0.00	0	1.00	896	0.97	0.18	1.00	0	1.00	914
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.24	0.43	0.00	0	1.00	911	0.17	0.37	0.00	0	1.00	914
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.87	0.34	1.00	0	1.00	912	0.94	0.24	1.00	0	1.00	914
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.83	0.38	1.00	0	1.00	158	0.90	0.30	1.00	0	1.00	164
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.15	0.36	0.00	0	1.00	225	1.00	0.00	1.00	1	1.00	3
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.81	0.40	1.00	0	1.00	32	0.67	0.58	1.00	0	1.00	3
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.77	0.43	1.00	0	1.00	35	1.00	0.00	1.00	1	1.00	3
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.27	0.45	0.00	0	1.00	33	0.33	0.58	0.00	0	1.00	3
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	2.22	1.88	2.00	0	12.00	913	2.67	1.87	2.00	0	19.00	914
	wife_wifeparcels	Number of parcels possessed by wife only	1.83	1.83	2.00	0	11.00	913	2.58	1.92	2.00	0	19.00	914
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.99	0.99	0.75	0	8.50	913	1.09	1.04	0.91	0	3.50	914
	wife_wifarea	Area of land in hectares possessed by wife only	0.81	0.94	0.63	0	8.50	913	1.05	1.05	0.88	0	13.50	914

TABLE 3.11. Summary Statistics, Outcome Variables Disaggregated by Age of Household Head (Non-Youth)

			Non-Youth Headed Households (<35 Years Old)											
			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.58	2.93	0.00	0	8.94	3221	0.49	1.76	0.00	0	9.58	3873
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.23	0.42	0.00	0	1.00	3221	0.07	0.26	0.00	0	1.00	3873
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.04	0.20	0.00	0	1.00	732	0.05	0.22	0.00	0	1.00	799
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.99	1.26	2.08	0	5.60	351	1.31	1.20	1.10	0	4.09	215
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.07	0.26	0.00	0	1.00	3221	0.06	0.24	0.00	0	1.00	3873
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.13	0.59	0.00	0	25.00	3188	0.21	0.54	0.00	0	9.00	3873
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.62	0.99	0.00	0	7.00	1066	0.47	1.00	0.00	0	10.00	3873
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.61	0.49	1.00	0	1.00	3221	0.74	0.44	1.00	0	1.00	3873
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.44	0.50	0.00	0	1.00	3161	0.97	0.18	1.00	0	1.00	3873
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.23	0.42	0.00	0	1.00	3220	0.15	0.35	0.00	0	1.00	3873
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.86	0.34	1.00	0	1.00	3218	0.95	0.22	1.00	0	1.00	3873
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.90	0.30	1.00	0	1.00	711	0.89	0.31	1.00	0	1.00	799
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.27	0.45	0.00	0	1.00	2457	0.98	0.15	1.00	0	1.00	2783
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.83	0.37	1.00	0	1.00	654	0.52	0.50	1.00	0	1.00	2783
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.80	0.40	1.00	0	1.00	689	0.74	0.44	1.00	0	1.00	2783
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.28	0.45	0.00	0	1.00	690	0.14	0.35	0.00	0	1.00	2783
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	1.80	2.13	1.00	0	14.00	3221	2.63	2.22	2.00	0	22.00	3873
	wife_wifeparcels	Number of parcels possessed by wife only	0.53	1.27	0.00	0	11.00	3221	0.67	1.46	0.00	0	19.00	3873
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.88	1.18	0.50	0	10.50	3221	1.26	1.84	1.00	0	65.77	3873
	wife_wifarea	Area of land in hectares possessed by wife only	0.24	0.62	0.00	0	8.50	3221	0.27	0.68	0.00	0	13.50	3873

TABLE 3.12. Summary Statistics, Outcome Variables Disaggregated by Age of Household Head (Youth)

			Youth Headed Households (<35 Years Old)											
			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.55	2.85	0.00	0	8.99	1105	0.58	1.89	0.00	0	8.01	453
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.24	0.42	0.00	0	1.00	1105	0.09	0.28	0.00	0	1.00	453
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.05	0.21	0.00	0	1.00	191	0.04	0.20	0.00	0	1.00	127
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.71	1.21	1.61	0	5.26	117	0.90	1.18	0.00	0	3.58	24
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.07	0.25	0.00	0	1.00	1105	0.06	0.24	0.00	0	1.00	453
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.09	0.31	0.00	0	4.00	1088	0.15	0.38	0.00	0	4.00	453
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.63	1.14	0.00	0	8.00	288	0.34	0.74	0.00	0	5.00	453
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.58	0.49	1.00	0	1.00	1105	0.71	0.45	1.00	0	1.00	453
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.41	0.49	0.00	0	1.00	1084	0.93	0.25	1.00	0	1.00	453
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.26	0.44	0.00	0	1.00	1104	0.18	0.38	0.00	0	1.00	453
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.87	0.34	1.00	0	1.00	1103	0.95	0.22	1.00	0	1.00	453
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.89	0.31	1.00	0	1.00	177	0.82	0.39	1.00	0	1.00	127
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.24	0.42	0.00	0	1.00	868	0.91	0.28	1.00	0	1.00	327
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.71	0.46	1.00	0	1.00	199	0.41	0.49	0.00	0	1.00	327
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.73	0.45	1.00	0	1.00	207	0.65	0.48	1.00	0	1.00	327
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.25	0.43	0.00	0	1.00	204	0.11	0.31	0.00	0	1.00	327
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	1.32	1.74	1.00	0	11.00	1105	1.77	1.77	2.00	0	13.00	453
	wife_wifeparcels	Number of parcels possessed by wife only	0.35	0.94	0.00	0	9.00	1105	0.45	1.01	0.00	0	7.00	453
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.57	0.96	0.13	0	18.00	1105	0.66	0.81	0.50	0	.75	453
	wife_wifarea	Area of land in hectares possessed by wife only	0.14	0.44	0.00	0	7.50	1105	0.17	0.40	0.00	0	3.63	453

TABLE 3.13. Summary Statistics, Outcome Variables Disaggregated by Region (Tigray)

			Tigray											
			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	2.43	3.50	0.00	0	8.85	1129	0.60	1.94	0.00	0	8.35	1129
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.33	0.47	0.00	0	1.00	1129	0.09	0.28	0.00	0	1.00	1129
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.02	0.14	0.00	0	1.00	259	0.00	0.00	0.00	0	0.00	262
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.87	1.10	1.79	0	5.56	105	1.74	1.15	1.79	0	3.58	66
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.05	0.22	0.00	0	1.00	1129	0.07	0.25	0.00	0	1.00	1129
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.11	0.30	0.00	0	2.00	1118	0.22	0.47	0.00	0	4.00	1129
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.65	1.00	0.00	0	7.00	391	0.53	1.02	0.00	0	8.00	1129
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.88	0.33	1.00	0	1.00	1129	0.95	0.22	1.00	0	1.00	1129
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.44	0.50	0.00	0	1.00	1120	0.90	0.30	1.00	0	1.00	1129
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.32	0.47	0.00	0	1.00	1128	0.23	0.42	0.00	0	1.00	1129
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.89	0.31	1.00	0	1.00	1127	0.93	0.26	1.00	0	1.00	1129
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.83	0.38	1.00	0	1.00	261	0.90	0.30	1.00	0	1.00	262
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.25	0.43	0.00	0	1.00	826	0.96	0.19	1.00	0	1.00	786
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.51	0.50	1.00	0	1.00	188	0.13	0.34	0.00	0	1.00	786
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.95	0.23	1.00	0	1.00	221	0.80	0.40	1.00	0	1.00	786
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.32	0.47	0.00	0	1.00	222	0.11	0.32	0.00	0	1.00	786
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	1.23	1.44	1.00	0	6.00	1129	2.00	1.63	2.00	0	9.00	1129
	wife_wifeparcels	Number of parcels possessed by wife only	0.61	1.06	0.00	0	6.00	1129	0.83	1.26	0.00	0	8.00	1129
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.50	0.70	0.25	0	10.50	1129	0.84	1.34	0.69	0	37.69	1129
	wife_wifarea	Area of land in hectares possessed by wife only	0.23	0.42	0.00	0	2.78	1129	0.30	0.49	0.00	0	4.00	1129

TABLE 3.14. Summary Statistics, Outcome Variables Disaggregated by Region (Amhara)

			Amhara											
			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.70	2.85	0.00	0	8.85	886	0.39	1.56	0.00	0	8.01	886
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.27	0.44	0.00	0	1.00	886	0.06	0.24	0.00	0	1.00	886
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.04	0.20	0.00	0	1.00	70	0.00	0.00	0.00	0	0.00	70
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	2.12	1.33	2.08	0	5.26	130	1.37	1.33	0.69	0	4.09	41
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.08	0.26	0.00	0	1.00	886	0.06	0.23	0.00	0	1.00	886
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.19	0.56	0.00	0	10.50	871	0.23	0.45	0.00	0	3.00	886
	rental_plots	Total number of plots the HH rented out on a monetary basis	1.39	1.36	1.00	0	7.00	229	0.63	1.17	0.00	0	9.00	886
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.61	0.49	1.00	0	1.00	886	0.85	0.36	1.00	0	1.00	886
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.59	0.49	1.00	0	1.00	848	0.98	0.14	1.00	0	1.00	886
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.26	0.44	0.00	0	1.00	886	0.14	0.35	0.00	0	1.00	886
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.89	0.32	1.00	0	1.00	886	0.97	0.17	1.00	0	1.00	886
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.97	0.17	1.00	0	1.00	70	1.00	0.00	1.00	1	1.00	70
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.29	0.45	0.00	0	1.00	650	0.93	0.26	1.00	0	1.00	599
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.87	0.34	1.00	0	1.00	192	0.77	0.42	1.00	0	1.00	599
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.69	0.47	1.00	0	1.00	194	0.75	0.44	1.00	0	1.00	599
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.23	0.42	0.00	0	1.00	197	0.34	0.48	0.00	0	1.00	599
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	2.41	2.30	2.00	0	10.00	886	3.37	2.49	3.00	0	22.00	886
	wife_wifeparcels	Number of parcels possessed by wife only	0.72	1.57	0.00	0	10.00	886	0.88	1.80	0.00	0	11.00	886
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.96	0.94	0.98	0	4.00	886	1.16	0.85	1.00	0	7.25	886
	wife_wifarea	Area of land in hectares possessed by wife only	0.27	0.60	0.00	0	3.55	886	0.28	0.55	0.00	0	2.94	886

TABLE 3.15. Summary Statistics, Outcome Variables Disaggregated by Region (Oromia)

			Oromia											
			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.46	2.79	0.00	0	8.99	1159	0.29	1.46	0.00	0	9.58	1159
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.22	0.42	0.00	0	1.00	1159	0.04	0.19	0.00	0	1.00	1159
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.05	0.23	0.00	0	1.00	328	0.13	0.34	0.00	0	1.00	328
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.68	1.24	1.79	0	4.68	122	0.96	1.06	0.69	0	3.18	71
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.07	0.26	0.00	0	1.00	1159	0.07	0.26	0.00	0	1.00	1159
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.14	0.83	0.00	0	25.00	1149	0.26	0.68	0.00	0	7.50	1159
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.42	0.90	0.00	0	8.00	416	0.49	1.04	0.00	0	10.00	1159
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.36	0.48	0.00	0	1.00	1159	0.58	0.49	1.00	0	1.00	1159
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.33	0.47	0.00	0	1.00	1156	0.99	0.08	1.00	0	1.00	1159
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.22	0.41	0.00	0	1.00	1159	0.10	0.30	0.00	0	1.00	1159
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.76	0.43	1.00	0	1.00	1156	0.98	0.15	1.00	0	1.00	1159
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.93	0.26	1.00	0	1.00	328	0.93	0.25	1.00	0	1.00	328
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.30	0.46	0.00	0	1.00	903	0.99	0.11	1.00	0	1.00	831
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.96	0.20	1.00	0	1.00	260	0.55	0.50	1.00	0	1.00	831
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.63	0.48	1.00	0	1.00	267	0.74	0.44	1.00	0	1.00	831
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.23	0.42	0.00	0	1.00	263	0.13	0.33	0.00	0	1.00	831
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	1.93	2.56	0.00	0	14.00	1159	3.25	2.47	3.00	0	19.00	1159
	wife_wifeparcels	Number of parcels possessed by wife only	0.39	1.25	0.00	0	11.00	1159	0.59	1.56	0.00	0	19.00	1159
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	1.08	1.67	0.00	0	18.00	1159	1.96	2.79	1.46	0	65.77	1159
	wife_wifarea	Area of land in hectares possessed by wife only	0.23	0.79	0.00	0	8.50	1159	0.32	0.98	0.00	0	13.50	1159

TABLE 3.16. Summary Statistics, Outcome Variables Disaggregated by Region (SNNP)

			SNNP											
			Baseline						Endline					
Outcome Family	Variable	Description	Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	0.74	2.08	0.00	0	8.29	1152	0.68	2.02	0.00	0	9.57	1152
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.12	0.33	0.00	0	1.00	1152	0.10	0.30	0.00	0	1.00	1152
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.06	0.23	0.00	0	1.00	266	0.01	0.09	0.00	0	1.00	266
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	2.01	1.28	1.79	0	5.60	111	1.05	1.18	0.69	0	3.87	61
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment	0.08	0.27	0.00	0	1.00	1152	0.05	0.22	0.00	0	1.00	1152
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.05	0.21	0.00	0	2.00	1138	0.12	0.46	0.00	0	9.00	1152
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.29	0.53	0.00	0	3.00	318	0.21	0.59	0.00	0	6.00	1152
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes / No)	0.56	0.50	1.00	0	1.00	1152	0.59	0.49	1.00	0	1.00	1152
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes / No)	0.41	0.49	0.00	0	1.00	1121	0.98	0.15	1.00	0	1.00	1152
	tenure_redist	HH believes land redistribution in kebele is likely (Yes / No)	0.16	0.36	0.00	0	1.00	1151	0.12	0.32	0.00	0	1.00	1152
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes / No)	0.92	0.28	1.00	0	1.00	1152	0.93	0.25	1.00	0	1.00	1152
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes / No)	0.91	0.28	1.00	0	1.00	229	0.77	0.42	1.00	0	1.00	266
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes / No)	0.23	0.42	0.00	0	1.00	946	0.99	0.12	1.00	0	1.00	894
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.82	0.38	1.00	0	1.00	213	0.65	0.48	1.00	0	1.00	894
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.90	0.30	1.00	0	1.00	214	0.64	0.48	1.00	0	1.00	894
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.30	0.46	0.00	0	1.00	212	0.03	0.16	0.00	0	1.00	894
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	1.31	1.49	1.00	0	9.00	1152	1.71	1.60	2.00	0	12.00	1152
	wife_wifeparcels	Number of parcels possessed by wife only	0.27	0.81	0.00	0	8.00	1152	0.36	0.98	0.00	0	8.00	1152
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.70	0.82	0.50	0	7.00	1152	0.79	0.91	0.58	0	9.75	1152
	wife_wifarea	Area of land in hectares possessed by wife only	0.14	0.42	0.00	0	5.00	1152	0.15	0.41	0.00	0	3.00	1152

TABLE 3.17. Summary Statistics, Household Characteristics

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	2.35	1.57	1.00	1	7.00	4303	2.26	1.54	1.00	1	7.00	4326
bagehhead	Age of household head (in years)	46.04	13.63	44.00	18	92.00	4326	52.19	13.62	50.00	20	99.00	4326
familysize	Total number of household members	6.30	2.65	6.00	1	31.00	4326	5.87	2.41	6.00	1	19.00	4326
areaowned	Total area of land owned by the household (in hectares)	1.54	1.51	1.25	0	50.00	4326	1.51	1.67	1.13	0	65.77	4326
score_nolivestock	Asset-based wealth index score	0.00	1.47	-0.25	-1.896	7.87	4324	0.00	1.47	-0.25	-1.896	7.87	4324
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.07	0.25	0.00	0	1.00	4326	0.07	0.25	0.00	0	1.00	4326
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.14	0.00	0	1.00	4326	0.04	0.20	0.00	0	1.00	4326
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.13	0.34	0.00	0	1.00	4278	0.09	0.29	0.00	0	1.00	4326

TABLE 3.18. Summary Statistics, Household Characteristics Disaggregated by Gender of Household Head (Male)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	2.55	1.60	2.00	1	7.00	3407	2.52	1.57	3.00	1	7.00	3412
bagehhead	Age of household head (in years)	45.96	13.83	44.00	18	92.00	3413	52.06	13.79	50.00	21	99.00	3412
familysize	Total number of household members	6.65	2.62	6.00	1	31.00	3413	6.37	2.26	6.00	1	17.00	3412
areaowned	Total area of land owned by the household (in hectares)	1.60	1.62	1.25	0	50.00	3413	1.59	1.79	1.25	0	65.77	3412
score_nolivestock	Asset-based wealth index score	0.11	1.49	-0.20	-1.896	7.87	3411	0.11	1.49	-0.20	-1.896	7.87	3410
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.06	0.24	0.00	0	1.00	3413	0.06	0.24	0.00	0	1.00	3412
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.13	0.00	0	1.00	3413	0.05	0.21	0.00	0	1.00	3412
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.13	0.34	0.00	0	1.00	3377	0.09	0.28	0.00	0	1.00	3412

TABLE 3.19. Summary Statistics, Household Characteristics Disaggregated by Gender of Household Head (Female)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	1.57	1.20	1.00	1	7.00	896	1.32	0.94	1.00	1	6.00	914
bagehhead	Age of household head (in years)	46.35	12.83	47.00	18	92.00	913	52.65	12.92	51.00	20	99.00	914
familysize	Total number of household members	4.99	2.32	5.00	1	18.00	913	3.97	1.99	4.00	1	19.00	914
areaowned	Total area of land owned by the household (in hectares)	1.31	1.00	1.00	0.03	8.50	913	1.21	1.04	1.00	0.03	13.50	914
score_nolivestock	Asset-based wealth index score	-0.39	1.28	-0.77	-1.871	5.54	913	-0.39	1.28	-0.78	-1.871	5.54	914
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.08	0.27	0.00	0	1.00	913	0.08	0.27	0.00	0	1.00	914
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.03	0.16	0.00	0	1.00	913	0.03	0.18	0.00	0	1.00	914
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.14	0.35	0.00	0	1.00	901	0.11	0.31	0.00	0	1.00	914

TABLE 3.20. Summary Statistics, Household Characteristics Disaggregated by Age of Household Head (Non-Youth)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	2.18	1.50	1.00	1	7.00	3206	2.19	1.50	1.00	1	7.00	3873
bagehhead	Age of household head (in years)	51.59	11.09	49.00	36	92.00	3221	54.57	12.31	53.00	36	99.00	3873
familysize	Total number of household members	6.64	2.72	7.00	1	31.00	3221	5.96	2.47	6.00	1	19.00	3873
areaowned	Total area of land owned by the household (in hectares)	1.65	1.61	1.25	0	50.00	3221	1.56	1.73	1.19	0	65.77	3873
score_nolivestock	Asset-based wealth index score	0.01	1.46	-0.25	-1.888	7.87	3220	0.01	1.47	-0.25	-1.896	7.87	3872
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.09	0.28	0.00	0	1.00	3221	0.07	0.26	0.00	0	1.00	3873
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.15	0.00	0	1.00	3221	0.05	0.21	0.00	0	1.00	3873
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.14	0.34	0.00	0	1.00	3186	0.09	0.29	0.00	0	1.00	3873

TABLE 3.21. Summary Statistics, Household Characteristics Disaggregated by Age of Household Head (Youth)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	2.83	1.69	3.00	1	7.00	1097	2.93	1.70	3.00	1	7.00	453
bagehhead	Age of household head (in years)	29.89	4.20	31.00	18	35.00	1105	31.83	3.43	32.00	20	35.00	453
familysize	Total number of household members	5.31	2.12	5.00	1	18.00	1105	5.09	1.73	5.00	1	12.00	453
areaowned	Total area of land owned by the household (in hectares)	1.22	1.13	1.00	0	18.00	1105	1.06	0.83	0.88	0.05	9.75	453
score_nolivestock	Asset-based wealth index score	-0.02	1.48	-0.29	-1.896	7.86	1104	-0.08	1.44	-0.32	-1.871	7.86	452
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.01	0.10	0.00	0	1.00	1105	0.00	0.07	0.00	0	1.00	453
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.01	0.10	0.00	0	1.00	1105	0.02	0.15	0.00	0	1.00	453
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.13	0.34	0.00	0	1.00	1092	0.08	0.27	0.00	0	1.00	453

TABLE 3.22. Summary Statistics, Household Characteristics Disaggregated Region (Tigray)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	2.17	1.40	1.00	1	7.00	1119	2.06	1.32	1.00	1	7.00	1129
bagehhead	Age of household head (in years)	46.49	12.55	45.00	18	83.00	1129	52.56	12.62	50.00	20	88.00	1129
familysize	Total number of household members	5.85	2.21	6.00	1	12.00	1129	5.61	2.24	6.00	1	13.00	1129
areaowned	Total area of land owned by the household (in hectares)	1.11	0.67	1.00	0.047	10.50	1129	1.26	0.82	1.00	0.008	5.75	1129
score_nolivestock	Asset-based wealth index score	-0.17	1.29	-0.35	-1.889	5.53	1129	-0.17	1.29	-0.35	-1.889	5.53	1129
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.10	0.29	0.00	0	1.00	1129	0.10	0.29	0.00	0	1.00	1129
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.15	0.00	0	1.00	1129	0.07	0.25	0.00	0	1.00	1129
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.12	0.32	0.00	0	1.00	1109	0.10	0.31	0.00	0	1.00	1129

TABLE 3.23. Summary Statistics, Household Characteristics Disaggregated Region (Amhara)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	1.90	1.27	1.00	1	6.00	883	2.06	1.38	1.00	1	7.00	886
bagehhead	Age of household head (in years)	45.07	13.90	43.00	18	92.00	886	51.75	13.89	50.00	21	99.00	886
familysize	Total number of household members	5.51	2.27	5.00	1	13.00	886	5.20	2.29	5.00	1	16.00	886
areaowned	Total area of land owned by the household (in hectares)	1.50	0.86	1.25	0	7.38	886	1.35	0.73	1.19	0	5.50	886
score_nolivestock	Asset-based wealth index score	0.16	1.33	-0.05	-1.854	5.81	885	0.16	1.33	-0.05	-1.854	5.81	885
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.14	0.35	0.00	0	1.00	886	0.14	0.35	0.00	0	1.00	886
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.12	0.00	0	1.00	886	0.03	0.17	0.00	0	1.00	886
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.17	0.37	0.00	0	1.00	882	0.08	0.28	0.00	0	1.00	886

TABLE 3.24. Summary Statistics, Household Characteristics Disaggregated Region (Oromia)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	2.53	1.62	2.00	1	7.00	1155	2.39	1.60	1.00	1	7.00	1159
bagehhead	Age of household head (in years)	47.13	13.87	46.00	18	92.00	1159	52.99	13.83	52.00	21	99.00	1159
familysize	Total number of household members	6.77	2.95	6.00	1	24.00	1159	6.14	2.54	6.00	1	19.00	1159
areaowned	Total area of land owned by the household (in hectares)	2.36	2.42	1.90	0	50.00	1159	2.23	2.75	1.63	0.1	65.77	1159
score_nolivestock	Asset-based wealth index score	0.12	1.61	-0.20	-1.867	7.87	1158	0.12	1.61	-0.20	-1.867	7.87	1158
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.04	0.19	0.00	0	1.00	1159	0.04	0.19	0.00	0	1.00	1159
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.13	0.00	0	1.00	1159	0.05	0.22	0.00	0	1.00	1159
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.14	0.35	0.00	0	1.00	1141	0.11	0.31	0.00	0	1.00	1159

TABLE 3.25. Summary Statistics, Household Characteristics Disaggregated Region (SNNP)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
edustat_hh	Educational status of household head, ranging from 1 = illiterate to 7 = post-secondary school	2.68	1.78	2.50	1	7.00	1146	2.49	1.73	1.00	1	7.00	1152
bagehhead	Age of household head (in years)	45.27	14.09	43.00	18	92.00	1152	51.34	14.08	50.00	22	99.00	1152
familysize	Total number of household members	6.87	2.75	6.00	1	31.00	1152	6.35	2.39	6.00	1	17.00	1152
areaowned	Total area of land owned by the household (in hectares)	1.16	0.83	1.00	0.02	7.00	1152	1.16	1.04	1.00	0.02	12.00	1152
score_nolivestock	Asset-based wealth index score	-0.08	1.56	-0.35	-1.896	6.59	1152	-0.08	1.56	-0.35	-1.896	6.59	1152
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.01	0.11	0.00	0	1.00	1152	0.01	0.11	0.00	0	1.00	1152
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.14	0.00	0	1.00	1152	0.02	0.15	0.00	0	1.00	1152
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.12	0.33	0.00	0	1.00	1146	0.08	0.26	0.00	0	1.00	1152

TABLE 3.26. Summary Statistics, Land Dispute Characteristics

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.07	0.25	0.00	0	1.00	4326	0.07	0.25	0.00	0	1.00	4326
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.14	0.00	0	1.00	4326	0.04	0.20	0.00	0	1.00	4326
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.13	0.34	0.00	0	1.00	4278	0.09	0.29	0.00	0	1.00	4326
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.02	0.14	0.00	0	1.00	4326	0.02	0.12	0.00	0	1.00	4326
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.01	0.09	0.00	0	1.00	4326	0.00	0.03	0.00	0	1.00	4326
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.02	0.13	0.00	0	1.00	4326	0.01	0.07	0.00	0	1.00	4326
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.07	0.25	0.00	0	1.00	4326	0.06	0.24	0.00	0	1.00	4326
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.00	0.06	0.00	0	1.00	4326	0.00	0.05	0.00	0	1.00	4326
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.01	0.08	0.00	0	1.00	4326	0.00	0.06	0.00	0	1.00	4326
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.01	0.08	0.00	0	1.00	4326	0.00	0.04	0.00	0	1.00	4326
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.00	0.05	0.00	0	1.00	4326	0.00	0.04	0.00	0	1.00	4326
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	2.93	0.94	3.00	1	4.00	399	2.93	0.94	3.00	1	4.00	399

TABLE 3.27. Summary Statistics, Land Dispute Characteristics Disaggregated by Gender of Household Head (Male)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.06	0.24	0.00	0	1.00	3413	0.06	0.24	0.00	0	1.00	3412
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.13	0.00	0	1.00	3413	0.05	0.21	0.00	0	1.00	3412
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.13	0.34	0.00	0	1.00	3377	0.09	0.28	0.00	0	1.00	3412
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.02	0.14	0.00	0	1.00	3413	0.01	0.12	0.00	0	1.00	3412
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.01	0.09	0.00	0	1.00	3413	0.00	0.03	0.00	0	1.00	3412
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.01	0.12	0.00	0	1.00	3413	0.00	0.06	0.00	0	1.00	3412
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.07	0.25	0.00	0	1.00	3413	0.06	0.24	0.00	0	1.00	3412
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.00	0.06	0.00	0	1.00	3413	0.00	0.05	0.00	0	1.00	3412
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.01	0.09	0.00	0	1.00	3413	0.00	0.06	0.00	0	1.00	3412
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.01	0.09	0.00	0	1.00	3413	0.00	0.04	0.00	0	1.00	3412
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.00	0.05	0.00	0	1.00	3413	0.00	0.04	0.00	0	1.00	3412
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	2.92	0.95	3.00	1	4.00	298	2.92	0.95	3.00	1	4.00	298

TABLE 3.28. Summary Statistics, Land Dispute Characteristics Disaggregated by Gender of Household Head (Female)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.08	0.27	0.00	0	1.00	913	0.08	0.27	0.00	0	1.00	914
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.03	0.16	0.00	0	1.00	913	0.03	0.18	0.00	0	1.00	914
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.14	0.35	0.00	0	1.00	901	0.11	0.31	0.00	0	1.00	914
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.02	0.14	0.00	0	1.00	913	0.02	0.14	0.00	0	1.00	914
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.01	0.11	0.00	0	1.00	913	0.00	0.05	0.00	0	1.00	914
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.02	0.15	0.00	0	1.00	913	0.01	0.09	0.00	0	1.00	914
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.07	0.25	0.00	0	1.00	913	0.07	0.26	0.00	0	1.00	914
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.00	0.07	0.00	0	1.00	913	0.00	0.05	0.00	0	1.00	914
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.01	0.07	0.00	0	1.00	913	0.00	0.03	0.00	0	1.00	914
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.00	0.03	0.00	0	1.00	913	0.00	0.06	0.00	0	1.00	914
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.00	0.05	0.00	0	1.00	913	0.00	0.00	0.00	0	0.00	914
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	2.96	0.94	3.00	1	4.00	101	2.96	0.94	3.00	1	4.00	101

TABLE 3.29. Summary Statistics, Land Dispute Characteristics Disaggregated by Age of Household Head (Non-Youth)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.09	0.28	0.00	0	1.00	3221	0.07	0.26	0.00	0	1.00	3873
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.15	0.00	0	1.00	3221	0.05	0.21	0.00	0	1.00	3873
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.14	0.34	0.00	0	1.00	3186	0.09	0.29	0.00	0	1.00	3873
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.02	0.14	0.00	0	1.00	3221	0.02	0.13	0.00	0	1.00	3873
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.01	0.09	0.00	0	1.00	3221	0.00	0.04	0.00	0	1.00	3873
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.01	0.12	0.00	0	1.00	3221	0.01	0.07	0.00	0	1.00	3873
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.07	0.26	0.00	0	1.00	3221	0.06	0.24	0.00	0	1.00	3873
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.00	0.06	0.00	0	1.00	3221	0.00	0.05	0.00	0	1.00	3873
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.01	0.08	0.00	0	1.00	3221	0.00	0.06	0.00	0	1.00	3873
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.01	0.09	0.00	0	1.00	3221	0.00	0.04	0.00	0	1.00	3873
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.00	0.05	0.00	0	1.00	3221	0.00	0.04	0.00	0	1.00	3873
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	2.97	0.93	3.00	1	4.00	308	2.95	0.93	3.00	1	4.00	362

TABLE 3.30. Summary Statistics, Land Dispute Characteristics Disaggregated by Age of Household Head (Youth)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.01	0.10	0.00	0	1.00	1105	0.00	0.07	0.00	0	1.00	453
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.01	0.10	0.00	0	1.00	1105	0.02	0.15	0.00	0	1.00	453
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.13	0.34	0.00	0	1.00	1092	0.08	0.27	0.00	0	1.00	453
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.01	0.12	0.00	0	1.00	1105	0.01	0.09	0.00	0	1.00	453
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.01	0.10	0.00	0	1.00	1105	0.00	0.00	0.00	0	0.00	453
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.02	0.15	0.00	0	1.00	1105	0.00	0.07	0.00	0	1.00	453
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.07	0.25	0.00	0	1.00	1105	0.06	0.24	0.00	0	1.00	453
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.01	0.07	0.00	0	1.00	1105	0.00	0.00	0.00	0	0.00	453
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.01	0.09	0.00	0	1.00	1105	0.00	0.05	0.00	0	1.00	453
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.00	0.06	0.00	0	1.00	1105	0.00	0.05	0.00	0	1.00	453
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.00	0.04	0.00	0	1.00	1105	0.00	0.00	0.00	0	0.00	453
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	2.78	0.98	3.00	1	4.00	91	2.70	1.02	3.00	1	4.00	37

TABLE 3.31. Summary Statistics, Land Dispute Characteristics Disaggregated by Region (Tigray)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.10	0.29	0.00	0	1.00	1129	0.10	0.29	0.00	0	1.00	1129
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.15	0.00	0	1.00	1129	0.07	0.25	0.00	0	1.00	1129
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.12	0.32	0.00	0	1.00	1109	0.10	0.31	0.00	0	1.00	1129
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.02	0.13	0.00	0	1.00	1129	0.02	0.14	0.00	0	1.00	1129
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.00	0.05	0.00	0	1.00	1129	0.00	0.03	0.00	0	1.00	1129
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.01	0.10	0.00	0	1.00	1129	0.01	0.07	0.00	0	1.00	1129
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.05	0.22	0.00	0	1.00	1129	0.07	0.25	0.00	0	1.00	1129
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.00	0.07	0.00	0	1.00	1129	0.00	0.04	0.00	0	1.00	1129
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.01	0.12	0.00	0	1.00	1129	0.00	0.07	0.00	0	1.00	1129
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.01	0.08	0.00	0	1.00	1129	0.00	0.04	0.00	0	1.00	1129
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.00	0.05	0.00	0	1.00	1129	0.00	0.00	0.00	0	0.00	1129
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	3.16	0.73	3.00	1	4.00	117	3.16	0.73	3.00	1	4.00	117

TABLE 3.32. Summary Statistics, Land Dispute Characteristics Disaggregated by Region (Amhara)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.14	0.35	0.00	0	1.00	886	0.14	0.35	0.00	0	1.00	886
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.12	0.00	0	1.00	886	0.03	0.17	0.00	0	1.00	886
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.17	0.37	0.00	0	1.00	882	0.08	0.28	0.00	0	1.00	886
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.02	0.14	0.00	0	1.00	886	0.01	0.08	0.00	0	1.00	886
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.02	0.15	0.00	0	1.00	886	0.00	0.00	0.00	0	0.00	886
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.02	0.12	0.00	0	1.00	886	0.00	0.05	0.00	0	1.00	886
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.08	0.27	0.00	0	1.00	886	0.06	0.23	0.00	0	1.00	886
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.00	0.06	0.00	0	1.00	886	0.00	0.06	0.00	0	1.00	886
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.01	0.08	0.00	0	1.00	886	0.01	0.07	0.00	0	1.00	886
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.01	0.11	0.00	0	1.00	886	0.01	0.07	0.00	0	1.00	886
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.01	0.07	0.00	0	1.00	886	0.01	0.07	0.00	0	1.00	886
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	3.08	1.04	3.00	1	4.00	72	3.08	1.04	3.00	1	4.00	72

TABLE 3.33. Summary Statistics, Land Dispute Characteristics Disaggregated by Region (Oromia)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.04	0.19	0.00	0	1.00	1159	0.04	0.19	0.00	0	1.00	1159
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.13	0.00	0	1.00	1159	0.05	0.22	0.00	0	1.00	1159
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.14	0.35	0.00	0	1.00	1141	0.11	0.31	0.00	0	1.00	1159
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.03	0.16	0.00	0	1.00	1159	0.02	0.13	0.00	0	1.00	1159
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.01	0.07	0.00	0	1.00	1159	0.00	0.03	0.00	0	1.00	1159
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.02	0.15	0.00	0	1.00	1159	0.01	0.07	0.00	0	1.00	1159
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.07	0.26	0.00	0	1.00	1159	0.07	0.26	0.00	0	1.00	1159
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.00	0.07	0.00	0	1.00	1159	0.00	0.07	0.00	0	1.00	1159
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.00	0.05	0.00	0	1.00	1159	0.00	0.06	0.00	0	1.00	1159
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.00	0.07	0.00	0	1.00	1159	0.00	0.04	0.00	0	1.00	1159
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.00	0.03	0.00	0	1.00	1159	0.00	0.04	0.00	0	1.00	1159
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	2.85	0.98	3.00	1	4.00	124	2.85	0.98	3.00	1	4.00	124

TABLE 3.34. Summary Statistics, Land Dispute Characteristics Disaggregated by Region (SNNP)

Variable	Description	Baseline						Endline					
		Mean	SD	Median	Min	Max	Obs N	Mean	SD	Median	Min	Max	Obs N
redland	Household has ever lost land due to official land redistribution (Yes / No)	0.01	0.11	0.00	0	1.00	1152	0.01	0.11	0.00	0	1.00	1152
lland	Household has lost land due to any other reason (e.g., expropriation) (Yes/No)	0.02	0.14	0.00	0	1.00	1152	0.02	0.15	0.00	0	1.00	1152
dispute	Household experienced a land dispute in past 2 years (Yes / No)	0.12	0.33	0.00	0	1.00	1146	0.08	0.26	0.00	0	1.00	1152
h2ba	Household experienced a conflicting land claim by non family members in past 2 yrs (Yes/No)	0.01	0.12	0.00	0	1.00	1152	0.02	0.12	0.00	0	1.00	1152
h2bb	Household experienced a conflicting land claim following divorce, in past 2 yrs (Yes/No)	0.01	0.08	0.00	0	1.00	1152	0.00	0.05	0.00	0	1.00	1152
h2bc	Household experienced a conflicting land claim related to inheritance, in past 2 yrs (Yes/No)	0.02	0.13	0.00	0	1.00	1152	0.01	0.08	0.00	0	1.00	1152
h2bd	Household experienced a conflicting land claim related to boundaries or encroachment, in past 2 yrs (Yes/No)	0.08	0.27	0.00	0	1.00	1152	0.05	0.22	0.00	0	1.00	1152
h2be	Household experienced conflict that arose from exchange of parcels of land, in past 2 yrs (Yes/No)	0.00	0.05	0.00	0	1.00	1152	0.00	0.00	0.00	0	0.00	1152
h2bf	Household experienced conflict in relation to access to roads, in past 2 yrs (Yes/No)	0.01	0.08	0.00	0	1.00	1152	0.00	0.03	0.00	0	1.00	1152
h2bg	Household experienced conflict in relation to water, in past 2 yrs (Yes/No)	0.00	0.07	0.00	0	1.00	1152	0.00	0.00	0.00	0	0.00	1152
h2bh	Household experienced conflict in relation to sharecropping or rental matters, in past 2 yrs (Yes/No)	0.00	0.03	0.00	0	1.00	1152	0.00	0.00	0.00	0	0.00	1152
serious_disputes	Household ranking of seriousness of land disputes (4 point likeart; 1 = Very serious; 4 = Not serious)	2.60	0.97	3.00	1	4.00	86	2.60	0.97	3.00	1	4.00	86

Table 3.35. Supplemental MDES chart by outcome variable: Treatment A

Outcome Family	Variable	Label	Treatment A							
			Baseline Mean	Baseline SD	ICC	Mean N per cluster	Cluster N	MDES	Detectable change in mean difference	% change
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.98	3.15	0.11	21	181	0.17	0.54	27%
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.29	0.46	0.10	21	181	0.16		16%
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.06	0.23	0.04	36	22	0.34		34%
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.80	1.18	0.09	3	123	0.33	0.39	22%
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment (Yes/No)	0.07	0.26	0.01	21	181	0.1		10%
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.13	0.44	0.04	21	181	0.13	0.06	44%
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.23	0.72	0.03	21	181	0.12	0.09	38%
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes/No)	0.58	0.49	0.25	21	181	0.23		23%
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes/No)	0.45	0.50	0.09	21	181	0.16		16%
	tenure_redist	HH believes land redistribution in kebele is likely (Yes/No)	0.26	0.44	0.11	21	181	0.17		17%
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes/No)	0.87	0.34	0.07	21	181	0.16		16%
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes/No)	0.92	0.27	0.04	36	22	0.13		13%
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes/No)	0.27	0.44	0.09	16	178	0.16		16%
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.94	0.23	0.34	10	175	0.27		27%
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.73	0.45	0.09	10	175	0.19		19%
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.30	0.46	0.11	10	175	0.19		19%
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	2.04	2.16	0.23	21	181	0.22	0.48	23%
	wife_wifeparcels	Number of parcels possessed by wife only	0.50	1.26	0.09	21	181	0.16	0.20	40%
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.99	1.18	0.21	21	181	0.21	0.25	25%
	wife_wifarea	Area of land in hectares possessed by wife only	0.23	0.64	0.07	21	181	0.14	0.09	39%

Table 3.36. Supplemental MDES chart by outcome variable: Treatment B

Outcome Family	Variable	Label	Treatment B							
			Baseline Mean	Baseline SD	ICC	Mean N per cluster	Cluster N	MDES	Detectable change in mean difference	% change
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	2.25	3.28	0.12	18	156	0.24	0.79	35%
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.33	0.47	0.11	18	156	0.24		24%
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.04	0.20	0.04	32	21	0.48		48%
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.84	1.19	0.11	3	94	0.6	0.71	39%
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment (Yes/No)	0.07	0.26	0.00	18	156	0.19		19%
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.15	0.49	0.03	17	156	0.2	0.10	64%
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.28	0.78	0.01	17	156	0.19	0.15	54%
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes/No)	0.60	0.49	0.26	18	156	0.28		28%
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes/No)	0.48	0.50	0.09	17	156	0.23		23%
	tenure_redist	HH believes land redistribution in kebele is likely (Yes/No)	0.27	0.45	0.10	18	156	0.24		24%
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes/No)	0.85	0.35	0.09	18	156	0.23		23%
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes/No)	0.93	0.26	0.04	32	21	0.48		48%
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes/No)	0.32	0.46	0.08	13	152	0.25		25%
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.94	0.24	0.40	9	147	0.37		37%
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.70	0.46	0.10	9	147	0.31		31%
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.31	0.46	0.11	9	147	0.31		31%
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	2.12	2.25	0.23	18	156	0.27	0.61	29%
	wife_wifeparcels	Number of parcels possessed by wife only	0.58	1.34	0.09	18	156	0.23	0.31	54%
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	1.00	1.21	0.22	18	156	0.27	0.33	33%
	wife_wifarea	Area of land in hectares possessed by wife only	0.24	0.60	0.06	18	156	0.22	0.13	55%

Table 3.37. Supplemental MDES chart by outcome variable: Treatment C

Outcome Family	Variable	Label	Treatment C							
			Baseline Mean	Baseline SD	ICC	Mean N per cluster	Cluster N	MDES	Detectable change in mean difference	% change
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	2.07	3.19	0.12	18	174	0.23	0.73	35%
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.31	0.46	0.11	18	174	0.22		22%
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.06	0.23	0.02	20	21	0.54		54%
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.80	1.20	0.07	3	109	0.55	0.66	37%
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment (Yes/No)	0.07	0.26	0.01	18	174	0.19		19%
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.13	0.44	0.05	18	174	0.2	0.09	70%
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.23	0.74	0.04	18	174	0.2	0.15	64%
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes/No)	0.61	0.49	0.24	18	174	0.26		26%
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes/No)	0.45	0.50	0.09	18	174	0.22		22%
	tenure_redist	HH believes land redistribution in kebele is likely (Yes/No)	0.28	0.45	0.10	18	174	0.23		23%
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes/No)	0.88	0.33	0.06	18	174	0.21		21%
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes/No)	0.95	0.22	0.08	20	21	0.62		62%
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes/No)	0.24	0.43	0.07	13	171	0.23		23%
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.95	0.23	0.41	8	165	0.33		33%
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.71	0.46	0.09	8	165	0.24		24%
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.31	0.46	0.11	8	165	0.24		24%
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	2.05	2.13	0.24	18	174	0.26	0.55	27%
	wife_wifeparcels	Number of parcels possessed by wife only	0.50	1.26	0.10	18	174	0.22	0.28	56%
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.95	1.07	0.19	18	174	0.25	0.27	28%
	wife_wifarea	Area of land in hectares possessed by wife only	0.23	0.65	0.07	18	174	0.21	0.14	60%

Table 3.38. Supplemental MDES chart by outcome variable: Treatment D

Outcome Family	Variable	Label	Treatment D							
			Baseline Mean	Baseline SD	ICC	Mean N per cluster	Cluster N	MDES	Detectable change in mean difference	% change
Access to credit	credit_amt	Amount of credit taken for farming purposes in past year in logged Birr	1.62	2.94	0.11	28	280	0.15	0.44	27%
	credit_farm	Household took any credit for farming purposes in past year (Yes/No)	0.24	0.43	0.10	28	280	0.15		15%
	Credit_collat	HH formally or informally used land as collateral to obtain credit (Yes/No)	0.05	0.21	0.04	45	23	0.4		40%
Land disputes	dispute_resolve_time	Average time to resolve a land dispute in months	1.91	1.23	0.12	3	223	0.38	0.47	24%
	dispute_boundary	HH experienced conflicting land claim related to boundaries or encroachment (Yes/No)	0.07	0.25	0.02	28	280	0.12		12%
Land rental activity	rental_hectares	Total area of land the HH rented out, in hectares	0.12	0.55	0.04	28	280	0.13	0.07	61%
	rental_plots	Total number of plots the HH rented out on a monetary basis	0.19	0.63	0.05	28	280	0.13	0.08	44%
Soil & water investments	swc_invested	HH invested in any soil or water conservation measures (Yes/No)	0.60	0.49	0.30	28	280	0.21		21%
Land tenure security	tenure_heritable	HH believes it has heritable right to bequeath land (Yes/No)	0.41	0.49	0.07	28	280	0.14		14%
	tenure_redist	HH believes land redistribution in kebele is likely (Yes/No)	0.25	0.44	0.10	28	280	0.15		15%
	tenure_business	HH feels more secure in credit-based business transactions w/ land certificate holder (Yes/No)	0.86	0.34	0.07	28	280	0.15		15%
	tenure_investment	HH believes land certificate program will have positive impact on land investment (Yes/No)	0.90	0.30	0.05	43	23	0.41		41%
Female empowerment & decision-making over land	wife-hasland	Wife possesses land in her name (Yes/No)	0.19	0.39	0.05	21	279	0.15		15%
	wife_landcert	Wife has certificate of title for land in her possession (Yes/No)	0.71	0.46	0.39	12	278	0.25		25%
	wife_decidecrops	Wife decides what crops to grow on land in her possession (Yes/No)	0.77	0.42	0.07	12	278	0.18		18%
	wife-rentout	Wife can rent out land in her possession at her discretion (Yes/No)	0.29	0.45	0.15	12	278	0.2		20%
	wife_totalparcels	Number of parcels possessed by wife only, or husband and wife jointly	1.60	2.04	0.21	28	280	0.18	0.37	23%
	wife_wifeparcels	Number of parcels possessed by wife only	0.48	1.20	0.09	28	280	0.15	0.18	37%
	wife_totalarea	Area of land in hectares possessed by wife only, or husband and wife jointly	0.73	1.07	0.12	28	280	0.16	0.17	23%
	wife_wifarea	Area of land in hectares possessed by wife only	0.21	0.57	0.06	28	280	0.14	0.08	38%

ANNEX IV—DATA COLLECTION INSTRUMENTS

Annex 3 consists of the final versions of the data collection instruments as used in the individual ELTAP and ELAP baseline data collection efforts and the combined ELTAP/ELAP endline data collection. The instruments are organized as follows:

ELTAP and ELAP Baseline Data Collection Instruments

Household Survey.....	128
Wives Survey	150

ELTAP/ELAP Endline Data Collection Instruments

Household Survey.....	156
Wives Survey	207
Community Questionnaire.....	227
Woreda Questionnaire.....	243

Ethiopia-Strengthening Land Administration Program: Baseline Survey

Household Questionnaire

Introduction: the purpose of this survey is to generate a database that will help to measure the effects of land registration and title certification by comparing the present situation and changes observed after some future time in the sample households drawn from selected program kebeles.

Segment A: Identification

A1: Endline household ID): (**hh_id**)

A2: Baseline household ID: (**quest_id**)

A3: Round of baseline data collection: (**bround**)

A4: Region (**killil**)

A5: Zone (**zone**).

A6: Woreda (**woreda**).

A7: Planned to receive 2nd level certification (intervention) or not (control): (**interv_control**)

Segment 3: Demographic and Socio-economic Issues

8. Sex of interviewee (male =1, female = 2) (**bsex**)

9. Age of interviewee (No): (**bage**)

10. Family Size (all household members including interviewee) (**bfamilysize**).

11. Number of Females less than 10 years old. (**Bnumfema**).

12. Number of Females 10 to13 years old (**bnumfemb**)

13. Number of Females 14 and above years old (**bnumfemc**)

14. Number of Males less than 10 years old. (**bnummalea**)

15. Number of Males 10 to 13 years old. (**bnummaleb**) .

16. Number of Males 14 and above years old. (**bnummalec**)

17. Marital status of interviewee (**bmaristat**) (unmarried=1, married=2, divorcee =3, widower/ed=4)
18. What TYPE of family is this household? (**type_hh**)
19. Educational status of household head .(**bedustathhh**) (illiterate=1, read only=2, read & write=3, Grade 4 complete =4, Grade 8 complete = 5, Grade 10-12 complete = 6; above grade 12= 7)
20. Educational status of the (primary) spouse (**bedustatsp**) (illiterate=1, read only=2, read & write=3, Grade 4 complete=4, Grade 8 complete=5, Grade 10-12 complete=6 above grade 12= 7)
21. Secondary economic activity of the household members, if any, (**bsececontact**)
22. How much money or money equivalent income did the household earn from this/these secondary economic activity/ies during the past one year, namely, from Yekatit 2002 to Tir 2004, in Birr? (**bsececoninc**).
23. How many plots of land does your household possess? (**bplotno**)
24. Does your HH possess land in urban areas or kebeles surrounding urban areas? (**urbparc1**)

Enumerator: ask the interviewee the number of land parcels he currently owns, the size of the parcels, how he acquired them, and when. Write the area in hectare and indicate the amount and name of the local unit in the bracket.

23	25	26	27	28	29
Plot ID	Parcel area (ha)*	Area in local unit	Name of local area unit	How was parcel acquired?	When was it acquired? (year in Ethiopian Calendar)
Plot_id	p_area_hect	size_local	local_unit	p_acq	p_yracq
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

* Enumerator: please, ask the local unit and convert it to hectare.

23	30	31	32	33	34
Plot ID	Who possesses parcel	Who has certificate for parcel	Who decides what crops to grow on parcel	Who decides on the use of produced from parcel	Who decides on the transfer for parcel?
	p_poss	p_cert	p_decidegrow	p_decideuse	p_decidettransfer
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

Segment 4: Land Possession and Land Use

37. Is your father alive? (Yes =1, No = 0) (**fathal**).
38. If the answer is 'No', what happened to his land? (**fathland**).
39. If bequeathed, how was the land divided? . (**bbeqdiv**)
40. Does your household possess land for ANNUAL crop production? (**bannland**) (Yes =1, No = 0)
- 40b. Number of plots of land household possess (not include rented-in land)
41. State the total size of land used for ANNUAL crop production in hectare (**bannlandsize**). .
42. Does your household possess land for PERENNIAL crop production? (**bperland**) (Yes =1, No = 0).
43. State the total size of land used for PERENNIAL crop production in hectare (**bperlandsize**)
44. Does your household possess land for GARDEN crops production? (Yes =1, No = 0) (**bgardland**)
45. State the total size of land used for garden crop production in hectare. (**bgardlandsize**) .
46. Does your household possess its own pastureland? (Yes =1, No = 0). (**ownpast**)
47. State the total size of your household's own pasture land in hectare. . (**ownpastsize**)
48. Does your household use a COMMON pastureland? (Yes =1, No = 0).(**cpasl1**)
49. Does your household possess land that is specifically TREE LOT? (**btreelot**) (Yes =1, No 0)
50. Does your household possess land under a MAN-MADE tree lot? (**bplantloy**) (Yes =1, No = 0).
51. Does your household possess land under NATURALLY GROWN and protected trees? (**bnattree**) (Yes =1, No = 0).
52. State the total size of land used as TREE LOT in hectare (**btreelotsize**)
53. Does your household possess FALLOW LAND temporarily not cultivated? (Yes =1, No = 0) (**bfallow**)
54. State the total size of the FALLOW LAND under your possession in hectare. (**bfallowsize**).
-

Segment 6: Land Registration

55. Does your household possess certificate for the land it makes use of? **.(bcert)** (Yes =1, No = 0;
56. If yes, which type of certificate does the household have? **(bcertlevel)** 1= first level 2= second level 3= both
57. If yes, to whom the land certificate was issued? **(bparchold)**
58. If the certificate was issued to both husband and wife, how was the joint nature of the certification confirmed? **(bjoinconf)**
- 58b. How is the joint certification confirmed **(bjoinconf)**
59. If the land under the hh's possession is held under joint certification (of whichever type)? **(bjoincert)**
60. If the answer is yes to the above, do the two spouses have differential says on the incomes derived from their respective separate units? **.(bspousepinc)**. (Yes =1, No = 0)
- 60b. If yes, spouses keep their respective plots as somewhat separate units? **(bspousep)**
61. When was the certificate issued? Year in Eth. Calendar **(bcertyr)**
- a. first level **(bcertyrfirst)**
- b. second level **(bcertyrsecond)**
62. Has there been any change to the household land holding since the certificate was issued? **(bcertchange)** (Yes =1, No = 0) (If the answer is no, pass to question Number q78)
63. Have you or any member of the household inherited land from someone outside the household? **(binherfr)** (Yes =1, No = 0)
64. If yes, when? Year in Eth. Calendar **(binherfyr)** .
65. Did you or any member of the household inherited out to a member of the household or to someone outside the household? **.(binhert)** (Yes =1, No = 0)
66. If yes, When? Year in Eth. Calendar **.(binhertyr)**
70. Gift of land to a member of the household or to someone outside the household **(blandgift)** (Yes =1, No = 0)
71. If yes, When? Year in Eth. Calendar **.(blandgiftyr)**
72. Have you received land obtained from someone due to divorce settlement? **(blanddiv)** (Yes =1, No = 0) .
73. If yes, When? Year in Eth. Calendar **(blanddivyr)**

74. Did you lose land because of other reasons, e.g. expropriation of part of the land for public purposes or for investors, etc. (Yes =1, No = 0) (**lland1**).
75. If yes, When? Year in Eth. Calendar (**llandyrl**)
76. Have you informed the kebele administration about the change (s)? (**llandinfkl**) (Yes =1, No = 0)
77. Has the change been registered in the household's certificate of holding? (**llandreg1**) (Yes =1, No = 0)
78. Do you know anybody in your community that has died recently? (**bdied**) (Yes =1, No = 0)
79. What happened to the land? .(**bdiedland**)

Segment 5: Perception of Land Rights

80. What type of right do you have on the land under your possession?
- **Right to use : (btype_righta)**
 - **Right to contract/rent/share-out (btype_rightb)**
 - **Heritable right (btype_rightc)**
 - **Right to sell (btype_rightd)**
 - **Right to use it as collateral to get credit (btype_righte)**
81. What would you like to do with the farm land under your possession in the future? (**blandfuture**)
(Continue to use for the same farming =1, make more investment in farming = 2, rent-out the land and engage in another job = 3, live in town but continue farming = 4, If allowed I will sell the land and go for another job = 5)
82. Do you think the land certificate program implemented in your kebele will have positive impact on the following :
- 82.1 Tenure security (**certimp_tsec1**)
- 82.2. Investment on land (**certimp_lndinv1**)
- 82.3 Land renting (**certimp_lndrent1**)
- 82.4. Access to credit (**certimp_credit1**)
83. In the past 24 months, did you take any credit (formal or informal) by using your land as collateral?
1= yes 0= no (**bcreditcoll**)
84. If yes, from whom did you take credit? /1= microfinance institution 2= Bank 3=
individual (**bcreditcollfrom**)
85. Do you have communal land(eg. Pasture land, forest land) in your kebele? (**comlnd_keb1**)

86. What type of rights do you have on the communal land (e.g. pasture land, forest land) in your kebele? (if any) (**comlnd_right1**)
87. What change do you suggest regarding the use and management of communal land? (**bchangetocomm**)
88. Do you think that you will lose your existing rights on communal land in the future? 1= yes 0=no (**comlnd_losef1**)

Segment 7: Engagement in Land Rental/Sharecropping Activities

Enumerator: please start by asking the existence of experience in land markets in the kebele.

89. Your household entered an agreement of land renting/sharing out-OUT in the past. (**rentout**)
(Yes=1, No=0)
91. In the past three years, with whom has your household entered an agreement of land renting/sharing-OUT? (**boutwho**) (a relative =1, a close friend = 2, a person/household that is neither relative nor a friend = 3, others (specify) = 4 _____)
92. State the total size of land rented/shared-OUT in hectare (**blandoutsize**) .
93. Where from is/are the HH(s)/individual(s) to whom your HH rented/shared- OUT its 1st largest plot of land? (**boutwhflargest**) (From the same *gott* =1, from the same Kebele = 2, from the same Woreda = 3, From the Same Zone = 4, from the same Region = 5, from outside of the Region = 6)
94. Where from is/are the HH(s)/individual(s) to whom your HH rented/shared- OUT its 2nd largest plot of land? (**boutwhslargest**) . (From the same *gott* =1, from the same Kebele = 2, from the same Woreda = 3, From the Same Zone = 4, from the same Region = 5, from outside of the Region = 6)
95. Where from is/are the HH(s)/individual(s) to whom your HH rented/shared- OUT its 3rd largest plot of land? (**boutwhlargest**) (From the same *gott* =1, From the same Kebele = 2, From the same Woreda = 3, From the Same Zone = 4, From the same Region = 5, From outside of the Region = 6)
96. Why does your household rent-our/share-out its land? (**breas_renta** through **breas_rentf**) 1= shortage of labor 2= shortage of draft power 3= unable to purchase inputs (fertilizer, improved seeds) 4= renting/sharecropping yields better benefit 5= lack of credit 6= others
99. Has the household rented-OUT any of its plots on the basis of monetary rent payment or sharecropping in kind during the last 24 calendar months? (**brentout**) (Yes = 1, No = 0)
100. If yes to the above, how many of the household plots are rented-OUT under such arrangements? (No) (**brentoutnum**)
101. If yes to the foregoing question, for how many years (on the average for the different plots) were these renting-OUT arrangements made? (**brentoutyr**) .
102. How much did your household receive in land RENT payment per year for the land rented-OUT during the last two years? (**brenttotal**).
- 102b. Amount HH receives in land rent payment per annum for the largest plot (Birr) (**brecrentflargest**)
- 103a. In the past season, does HH possess land that's rented/shared IN? (Yes = 1, No = 0) (**rentin1**)

- 103b. state the total size of land rented/shared-in in hectare (**blandinsize**)
- 104a. Has the household rented-in any plot(s) on the basis of monetary payment? (Yes = 1, No = 0)
(**princlase1**)
- 104b. if yes, how many plots currently being used by HH are rentin-in on basis of monetary payment?
(**blandinunspecnum**)
105. If yes to the foregoing question, for how many years(on the average for the) (**blandinunspecyr**)
107. How much did your household pay in land rent per year for the land rented-in (**brentpaidtotal**)
- 107b. Amount of money household paid in land rent per annum for the largest farm plot.(**brentpaid**)
108. Has the household transferred any of its plots on the basis of unspecified. (**btransplot**)
109. If the HH has ever engaged in any sort of “OUT-transaction” of its land (be it on the basis of rental, sharecropping, or any long term arrangements), was the other spouse consulted beforehand?
(**bconsultout**) (Yes = 1, No = 0) .
110. If the HH has ever engaged in any sort of “IN-transaction” of its land (be it on the basis of rental, sharecropping, or any long term arrangements), was the other spouse consulted beforehand?
(**bconsultin**) (Yes = 1, No = 0)

Segment 8: Land Related Disputes

Enumerator: Please, remember that land related disputes, here, do not include disputes regarding afelama, (i.e., grazing one's animals on somebody else's crop or pasture).

111. Did your household involve in any land related dispute, during the last two years? (**bdispute**) . (Yes = 1, No = 0)
112. If yes, in how many land related disputes did your household involve in during the last two years? (**bdisnum**)
113. What type of land related disputes was the most serious one? (**bytpemostser**)
114. Was the dispute resolved? 1= yes 0= no (**bresmostyesno**)
115. If yes, how was this dispute finally resolved or referred to? (**bresmostser**)
116. For how long did the settlement of this dispute last, to date? (IN MONTHS) (**bdurmostser**)
117. Are you satisfied with the decision made to settle the dispute? (**bresmostsat**)
118. What type of land related disputes was the second serious one? (**btypesecser**)
119. Was the dispute resolved? 1= yes 0= no (**bressecyesno**)
120. If yes, how was this dispute finally resolved or referred to? (**bressecser**)
121. For how long did the settlement of this dispute last, to date? (**bdursecser**) (IN MONTHS)
122. Are you satisfied with the decision made to settle the disputes? (**bressecsat**)
123. What type of land related disputes was the third serious one? (**btypethirdser**)
124. Was the dispute resolved? 1= yes 0= no (**bthirdresyesno**)
125. If yes, how was this dispute finally resolved or referred to? (**brethirsser**)
126. For how long did the settlement of this dispute last, to date? (**bdurthirdser**) (IN MONTHS)
127. Are you satisfied with the decision made to settle the dispute? (**brethirdsat**)
-

Segment 9: Knowledge of Laws on Land Rights and Governance

128. Are you aware of the existing laws on land rights and obligations? (**bawarelaw**)
129. Do you understand the laws on land rights and obligations? (**bunderlaw**)
- 129b. Do you know and understand the existing land laws that affect your life(**bexpect**)
130. Do you think that the existing administrative/ judiciary institutions /arrangements are CAPABLE of enforcing land rights and obligations? (**llawenf1**) .
131. Do you think that the existing administrative / judiciary institutions /arrangements are FAIR ENOUGH in enforcing land rights and obligations? (**bcapfair**).
132. How confident are you that the government protects your right of land user? (**bconfpro**) (Very much confident = 1, confident = 2, less confident = 3, I have no confidence = 4)
- 133a. Do you think that the existing land laws adequately protect your rights as possessor of land? (**blawpro**)
- 133b. Are you aware of the existence of laws on land rights and obligations as a farming household? (**bknowlaw**) .

Segment 10: Description of Feelings about Land Tenure and Tenure Security

[Enumerator: please do an in-depth-interview of both the husband and wife (meaning, wherever available, both the husband and wife will separately sit for in-depth-interview on feelings about land tenure and tenure security]. (Especially fear of dispassion loss of right by the government due to land redistribution, etc.)

- 134. Feelings before the issuance of land certificate. (**bfeelpast**)
- 135. Feelings at present (**bfeelpresent**)

Segment 11: Perception of Ownership of Secure and Full Usufruct Rights

Enumerator: For the following scale (1) First read out very clearly each of the statements and then the various levels of agreement/disagreement to the respondent. (2) Then circle the values written below the level of agreement/disagreement that is chosen by the respondent for each statement respectively. (3) Finally, sum up the values that are circled and insert this summation in the space provided at the end.

- 136. I believe that a redistribution of land is likely to take place in my Kebele in the coming five years. (**redist_risk1**)
- 137. I believe that the land that is currently under my possession will remain within my control or that of my wife/husband or that of my children's' during the coming 15 years. (**inherit_risk1**)
- 138. I am fully convinced that I will stand to benefit in the future from whatever soil and/or water conservation measures I may undertake on my land at present. (**conserve_risk1**)
- 139. I am fully convinced that I will NOT stand to benefit in the future from trees that I may plant on my land at present. (**tree_risk1**)
- 140. I feel that renting out my land for money or on sharecropping basis EVEN FOR ONE CROPPING SEASON is a risky business that I should avoid unless and otherwise I have no other options of overcoming my difficulties. (**rentin1_risk1**)
- 141. I feel that renting out my land for money or on sharecropping basis FOR 5 CROPPING SEASON is a risky business that I should avoid unless and otherwise I have no other options of overcoming my difficulties. (**rentin5_risk1**)
- 142. I would not be running any risk whatsoever if I rent IN land for money or on a sharecropping FOR ONE CROPPING SEASON (**rentout1_risk1**)
- 143. I would not be running any risk whatsoever if I rent IN land for money or on a sharecropping FOR 5 CROPPING SEASONS (**rentout5_risk1**)
- 144. I DON'T believe that having a Certificate of Possession is a guarantee of secured hold over one's land. (**certposs_risk1**)

145. I will feel more secure to enter into any sort of business transaction involving credit if it were with a farmer who has a Certificate of Possession over his land than that who has not. (**certbiz_risk1**)

Segment 12: Level of Soil Conservation Measures

146. Do you have farm plots located on sloppy lands where soil erosion caused by water is a problem? (**water_erosion1**) (Yes = 1, No = 0)
147. Length of soil bunds constructed (in meters) by the household itself (using its own resources) to date and existing (**soilbund_hh1**).
148. Length of stone bunds constructed (in meters) by the household itself (using its own resources) to date and existing (**stonebund_hh1**)
149. Length of hedges constructed (in meters) by the household itself (using its own resources) to date and existing (**hedges_hh1**).
150. Length of vegetation/trash-lines constructed (in meters) by the household itself (using its own resources) to date and existing. (**vegline_hhl**) .
151. Length of soil bunds constructed (in meters) by or with the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing. (**soilbnd_othr1**)
152. Length of stone bunds constructed (in meters) by or with the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing. (**stonbnd_othr1**).
153. Length of hedges constructed (in meters) by or with the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing. (**hedges_othr1**).
154. Length of vegetation/trash-lines constructed (in meters) by or with the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing (**vegline_othr1**)
155. Length of soil ditches (*dichira*) constructed (in meters) by the household itself (using its own resources) to date and existing (in SNNPR) (**soildditch_hh1**)
156. Length of soil ditches (*dichira*) constructed (in meters) by or with the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing (in SNNPR) (**soildditch_othr1**)
157. Length of soil bunds stabilized by planting grasses, trees or bushes on them (in meters) practiced by the household itself (using its own resources) to date and existing (**bndgrass_hh1**)
158. Length of soil bunds stabilized by planting grasses, trees or bushes on them (in meters) practiced by the household with the support of GOs, NGOs, CBOs, to date and existing (**bndgrass_othr1**)

Segment 13: Water Harvesting and Conservation Measures

159. Do you use irrigation during dry season for production of annual/perennial crops on the land under your possession? (Yes = 1, No = 0), (**irrigation1**) .
160. Number of on-farm water retention structures (ponds, retention ditches) constructed by the household itself (using its own resources) to date and existing.(**rentent_hh1**).
161. Number of on-farm water retention structures (ponds, retention ditches) constructed by the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing (**rentent_othr1**)
162. Length of water harvesting canals constructed by the household itself using its own resources to date and existing . (**canals_hh1**)
163. Length of water harvesting canals constructed by the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing .(**canals_othr1**)
164. Number of hand-dug shallow well constructed by the household itself (using its own resources) to date and existing.(**wells_hh1**) .
165. 1 Number of hand-dug shallow well constructed by the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing. (**wells_othr1**)
-

Segment 14: Farm Closure/Fencing

[Enumerator: Note that the following questions do not refer to or include the homestead]

165. Length of existing dead material fencing around plots (in meters). . . (**bdeadfenc**) .
166. Length of existing live material fencing around plots (in meters). (**blivefenc**).
-

Segment 15: Investment in Perennial Crops

167. Number of coffee plants planted during the last 24 calendar months . (**bnoplanta**) .
168. Number of chat plant planted during the last 24 calendar months . (**bnoplantab**) .
169. Number of *enset* plants planted during the last 24 calendar months . (**bnoplantac**).
170. Number of hops (Gesho) plants planted during the last 24 calendar months (**bnoplantad**) .
171. Number of sisal plants planted during the last 24 calendar months . (**bnoplanate**)

172. Number of bamboo plants planted during the last 24 calendar months .(**bnoplantaf**)
173. Number of surviving (i.e., NINE months plus) NON-FRUIT trees planted during the last 24 calendar months).(**bnosura**) .
174. Number of surviving (i.e., NINE months plus) FRUIT trees planted during the last 24 calendar months (**bnousrb**) .
175. Number of seedlings of all types of NON-FRUIT trees raised by the household itself during the last 24 calendar months .(**bnoseeda**).
176. Number of seedlings of all types of NON-FRUIT trees bought by the household for own use during the last 24 calendar months (**bnossedb**) .
177. Number of seedlings of all types of FRUIT trees raised by the household itself during the last 24 calendar months . (**bnoseedc**)
178. Number of seedlings of all types of FRUIT trees bought by the household for own use during the last 24 calendar months .(**bnoseedd**)
179. Number of seedlings of all types of NON-FRUIT trees obtained free of charge by the HH from others (GOs, NGOs, CBOs) during the last 24 calendar months .(**bnoseede**)
180. Number of seedlings of all types of FRUIT trees obtained free of charge from others (GOs, NGOs, CBOs) during the last 24 calendar months .(**bnoseedf**)
181. Number of surviving (i.e., three months plus) INDEGENOUS trees planted during the last 24 calendar months). (**bnosurc**).

Definition: *indigenous* trees are trees naturally grown in the country (study area) and not brought from other countries abroad (exotic) and planted. Example, *Olea africana* (weyera), *Hygenia abyssinica* (kosso), etc. but not *Eucalyptus* (bahirzaf).

182. On which lands under your possession did you plant trees? (**btypetree**). (Backyard plots =1, in crop lands (agro-forestry) = 2, boundaries of crop lands =3, plots far away from homestead such as grazing areas = 4, Others (specify)

Segment 17: Animals, Animal Products, Production and Sales

Please tell us the number of animals that you hold (by type), number of animals you sold and bought, as well as the amount of animal products that you produced and sold (by type) during the past one year, namely from Yekatit 2002 to Tir 2004.

1. Type of Animals

Type of Animals		Number Currently Owned 183	Number Sold During the Year 184	Amount of income earned during the year 185	Number Bought During the Year 186	Number Slaughtered for Home Consumption 187
		(qty)	(qty_sold)	(live1_inc)	(qty_bought)	(qty_consumed)
Oxen	1					
Cows	2					
Heifers	3					
Bulls	4					
Calves	5					
Sheep	7					
Goats	8					
Chicken	10					
Equines	11					
Beehives, traditional	12					
Beehives, modern	13					

2. Type of Animal Products

Type of Animal Product	Amount Produced during the Year 190 (Amt_prod)	Amount Sold During the Year 191 (Amt_sold)	Amount of income earned during the Year (Birr) 192 (Amt_income)
a Milk (Liter)			
b Butter (Kg)			
c Cheese (Kg)			
d Egg (No.)			
e Meat (Kg)			
f Honey (Kg)			
g Hides and skin (No.)			
h Wool (kg)			

*Enumerator: please convert the local units to kg or liter.

Segment 18: Production and Sales of Food and Cash Crops

Please tell us the TYPE of FOOD and CASH crops you produced on your farm and the amount produced as well as sold during the past one crop year, namely from Yekatit 2002 to Tir 2004.

[Enumerator: (1) please ask the interviewee the list of crops, (2) Also, whenever appropriate, ask for average monthly or weekly production, and sales and then multiply that by 12 or 52 to arrive at the annual figures].

15.1 Cereal production and use

Food Item: Cereals	Produced (Qt)* 225 (bcerealqprod)	Sold		Given to others (qt)	Received from others (Qt)**	Purchased (qt)
		(Qt) 226 (Bcerealqsold)	Birr 227 (bcerealvsold)	228 (bcerealqgive)	229 (bcerealqrec)	230 (bcerealqbuy)

*Enumerator: please convert the local units to quintals (1 Qt = 100 kg).

** Received from others include: Food aid, credit/loan, gift, etc.

18.2 Pulses production and use

Food Item: pulses 231	Produced (Qt)* 232 (bpulseqprod)	Sold		Given to others (qt)	Received from others (Qt)**	Purchased (qt)
		(Qt) 233 (bpulseqsold)	Birr 234 (bpulsevsold)	235 (bpulseqgive)	236 (bpulseqrec)	237 (bpulseqbuy)

*Enumerator: please convert the local units to quintals (1 Qt = 100 kg).

** Received from others include: Food aid, credit/loan, gift, etc.

18.3.Oil crops production and use

Food Item: Oil crops 238	Produced (Qt)* 239 (boilqprod)	Sold		Given to others (qt)	Received from others (Qt)**	Purchased (qt)
		(Qt) 240(boilqsold)	Birr 241 (boilvsold)	242(boilqgive)	243(boilqrec)	244 (boilqbuy)

*Enumerator: please convert the local units to quintals (1 Qt = 100 kg).

** Received from others include: Food aid, credit/loan, gift, etc.

18.4.Tubers, roots, vegetables and fruit crops production and use

Crop category (code) 245	Crop type (code) 246	Produced (Qt)* 247	Sold		Given to others (qt) 250	Received from others (Qt)** 251	Purchased (qt) 252
			(Qt) 248	Birr 249			

*Enumerator: please convert the local units to quintals (1 Qt = 100 kg).

** Received from others include: Food aid, credit/loan, gift, etc.

18.5. Other cash crops

Food Item: other Cash Crops (code) 253	Produced (Qt)* 254	Sold		Given to others (qt) 257	Received from others (Qt)** 258	Purchased (qt) 259
		(Qt) 255	Birr 256			

*Enumerator: please convert the local units to quintals (1 Qt = 100 kg).

** Received from others include: credit/loan, gift, etc.

Segment19: Farm Inputs

[Enumerator, wherever appropriate: (1) ask the interviewee the amount of land on which each of the following farm inputs were applied in that crop year, (2) ask the amount of the input in question that was applied in that crop year. (3) Then calculate the amount of input per hectare, and enter the figure in the box provided.]

229. Amount of chemical fertilizer (DAP PLUS Urea) applied per hectare of Cultivated and during the past crop year, namely from Yekatit 2002 to Tir 2004 (in Kg.) **.(bchemfert)**
230. Amount of organic fertilizer (manure PLUS compost) applied per hectare of cultivated land during the past crop year, namely from Yekatit 2002 to Tir 2004 (in quintals.) **(borgfert)**
231. Did you sow/ plant IMPROVED seeds/seedlings on your farm during the past cropping season i.e. from Yekatit 2002 to Tir 2004? (Yes =1, No = 0) **.(bimprovseed).**
232. If Yes, for which major crops did you use improved seed? (Write the answer (s) on the blank space from the codes provided below).
233. Amount of powder crop protection chemicals (Pesticides PLUS herbicides) applied per hectare of cultivated land during the past crop year, namely from Yekatit 2002 to Tir 2004 (in kg.) **(bpowder).**
234. Amount of liquid crop protection chemicals (Pesticides PLUS herbicides) applied per hectare of cultivated land during the past crop year, namely from Yekatit 2002 to Tir 2002 (in liter.) **.(bliquid)**
235. Amount of credit taken for farming purposes during the past crop year, namely from Yekatit 2002 to Tir 2004 (in Birr) **.(bcreditamt).**
236. What is the source of credit taken? **(bcredsource)**

237. Amount of credit repaid during the past crop year, namely from Yekatit 2002 to Tir 2004 (in Birr) **(bcredpaid)**

Segment 20: Non-Farm/Purchased Food and Non-food Consumption Items

Please tell us the amount of non-farm food and non-food consumption items that you have PURCHASED or received through aid/gift (by type) during the past one year, namely from Yekatit 2002 to Tir 2004.

[Enumerator: (1) please ask the interviewee following the list of food items, (2) Also, whenever appropriate, ask for average monthly or weekly purchase and receipt and then multiply that by 12 or 52 to arrive at the annual figures].

<u>Food Item Purchased/Received</u>	<u>Quantity Bought</u>	<u>Expenditure (Birr)</u>
	(bamtpro)	(bexppro)
Processed food* (kg)		
Fish (kg)	(bamtfish)	(bexpfish)
Oil (Lt.)	(bamtoil)	(bexpoil)
Sugar (kg)	(bamtsug)	(bexpsug)
Salt (kg)	(bamtsalt)	(bexpsalt)
Spices (kg)	(bamtspice)	(bexpspice)
Tea (kg)	(bamttea)	(bexptea)
Coffee (kg)	(bamtcoff)	(bexpcoff)
Gas (household fuel) (lit)	(bamtker)	(bexpker)
Firewood (bundle)	(bbexpfirewood)	(bamtfirewood)
Others, (specify)_____	(bamtotherit)	(bexpotherit)

Note: processed food include food like Spaghetti, bread, etc.

242. Ask the total amount of annual PURCHASE expenditure for the above listed consumption items of the household (IF the interviewee cannot recall for individual items bought) in birr. **(btotconsexp)**.
243. Ask the total amount of the household PURCHASE expenditure for non-food items (like hair care and hygiene, clothing, shoes, utensils, medication, etc.) during the past one year, namely from Yekatit 2002 to Tir 2004. **.(nonfoodexp1)**
244. Ask the total amount of household expenditure for REGULAR festivals/holidays Traditional/cultural events during the past one year, namely from Yekatit 2002 to Tir 2004. **.(holidayexp1)**

Segment 21: Ownership of Modern Possessions as Indicators of Wealth

[Enumerator: Please, mark '✓' if the household possess the item in the list below and add to the list if any]. IF interviewee does not have an item mark 'X'.

- 245. Iron-Roofed House. (**ironroof1**).
- 246. Television Set (**tv1**). .
- 247. Mobile Phone (**mobile1**).
- 248. Tape Recorder (**taperec1**)
- 249. Radio Receiver (**radio1**).
- 250. Set of Sofa. (**sofa1**) .
- 251. Spring/Sponge-mattresses bed (**mattress1**).
- 252. Metal/Plastic Water Barrel (**barrel1**). .
- 253. Horse/donkey cart (**cart1**)
- 254. Bicycle .(**bbikeandmotor**)
- 255. Motor Bicycle. (**bbikeandmotor**)
- 256. Steel plow (**plow1**).
- 257. Tractor. (**tractor1**)
- 258. Water pump (hand/ motorized) (**pump1**)
- 259. Modern Beehives. (**beehive1**).
- 260. Jewelry (Silver, Gold, etc.) (**jewelry1**).
- 261a. Kiosk (**kiosk1**).
- 261b. A house in town. (**townhouse1**).
- 262. Improved dairy cows (**improve_cow1**).
- 263. Fattening enterprise. (**fat_entrpz1**)
- 264. Modern milk churning equipment. (**milkchurn1**)

Segment 22: Permanent and Seasonal Migration

- 265. Has any member of your household left home for good (PERMANENTLY) during the last 24 calendar months? (**perm_migrat1**) (Yes = 1, No = 0) (if No go to Q.3450)
- 266. If the answer is YES, how many members of your household left home for Good (PERMANENTLY) during the last 24 calendar months? (**no_migrat1**).
- 267. Why did the member of the family that left first, leave? (1 = Schooling, 2 = Looking for job, 3= to assist relatives, 4 = sick/for medication, 5 = marriage; 6= others (specify). (**whymig1**)
- 268. Why did the member of the family that left second, leave? 1 = Schooling, 2 = Looking for job, 3= to assist relatives, 4 = sick/for medication, 5 = marriage; 6= others (specify). (**whymig1**)
- 269. Why did the member of the family that left third, leave? 1 = Schooling, 2 = Looking for job, 3= to assist relatives, 4 = sick/for medication, 5 = marriage; 6= others (specify). (**whymig1**).

270. Has any member of your household ever left home TEMPORARILY (for more than 3 days) and nights in search of work during the last 24 calendar months? (Yes = 1, No = 0) **(temp_leave1)**
271. If the answer is YES, how many of the members of your household have ever left home TEMPORARILY in search of work during the last 24 calendar months? **(btotleavep)**
272. If the answer is YES, for a TOTAL of how many weeks, has/have member(s) of your family been away from home TEMPORARILY in search of work during the last 24 calendar months? **(btotweekp)**
273. If your household member(s) has/have ever left home TEMPORARILY in search of work during the last 24 calendar months, where was the farthest place they went to in search of work? (Within the same gott =1, within the same Kebele = 2, within the same Woreda =3, Within the Same Zone = 4, within the same Region = 5, Outside of the Region = 6). Abroad =7 **(bfarleave)**
274. What is the total annual income earned (in Birr or Birr equivalent in kind) by the household member(s) that has left home TEMPORARILY in search of work during the last 24 calendar months ? **.(btotincp)**

Segment 23: General Condition of the Farm

[Enumerator: please follow this instruction and describe the farm situation, and make a photo of 1 or 2 sample farm households in the selected study kebele]:

275. Fencing/ closure of one of the major distant plots (not homestead), the material used for fencing, how well the fence is made. **(bfencetypa)**
276. Conservation measures of this distant plot (not homestead), type of conservation measure (physical, biological), how well the conservation is made. **(bconstypa)**
273. A homestead/garden plot: whether it is well utilized, well managed, fenced, organically fertilized, existence of perennial crops/trees, existence of private water ponds. **(bstateha) (bexistalla)**
274. Existence of stall feeding (cut and carry), how many animals, for what purpose (fattening, dairy cows, etc.) **(bexistalla)**

Ethiopia Strengthening Land Tenure Administration Program (ELTAP) Baseline Wives Survey
Ethiopia Land Administration Program (ELAP) Baseline Wives Survey

A Household Questionnaire for the WIFE(S)

Introduction: the purpose of this interview is to generate a database that will help to assess and analyze about the LAND RIGHTS of women from the perspective of wives in the male-headed households.

Segment A: Identification

- A1: Endline Household ID Number (**hh_id**)
A2: Baseline Household ID Number (**quest_id**)
A3: Region (**killil**)
A4: Zone (Zone)
A5: Woreda (**woreda**)
A6: Kebele (insert the name of selected kebele): (**PII**)

WIFE 1:

Enumerator: please ask the FIRST wife the following questions (if the household is a POLYGAMY one, more than one wife exists in a household, you also ask next the second wife).

5. How many plots of land does your household possess (exclude rented-IN and sharecropped-In plots)?
(**bw1_plotno**)
6. Do you possess land in your name? (Yes = 1; No = 0) (**bw1_possland**)
7. If yes, do you have a certificate of title for the plot of land you possess? (**bw1_posscert**) (Yes= 1; No= 0)
8. If yes, what type of certificate is it? 1= First level 2= Second level 888= I don't know (**bw1_certtype**)
9. If yes, in what form is the certificate issued to you? (**bw1_certform**)
10. If certificate is obtained jointly, how is its joint nature confirmed? (**bw1_jointconf**)
11. In your family is there any one married to more than one woman (1= Yes; 0 = No) (**bw1_husband**)
12. If your husband has MORE than one wife, do you think you have equal rights on land with his OTHER wife(s)? (Yes = 1, No= 0, I do not know about it = 888) (**bw1_equal**)
13. If your husband has more than one wife and there is a certificate for the land possessed by the household how is the certificate issued to the family? (**bw1_husbcert**)
14. If you have land in your name, who decides on what crops to grow on the land? (I myself = 1, my husband, = 2, I and my husband decide together =3) (**bw1_deccrop**)
15. If you possess land in your name, do you yourself make decisions regarding the use of the produce from the land? (Yes = 1, No= 0) (**bw1_yourdec**)
16. If no, do you want to be allowed to make a decision regarding the use of the produce from the land?
(Yes = 1, No= 0) (**bw1_wantdec**) .

17. If you possess land in your name, can you rent-out/sharecrop-out when you want? (Yes = 1, No= 0).
(bw1_rentou)
18. If yes to the above, do you make the decision by yourself? (Yes = 1, No= 0) (bw1_decrentout)
19. What is the current experience in this kebele in terms of sharing land in the event of divorce?
(w1_lddiv1)
20. What experience exists currently in this kebele in terms of possession of land in the event of the death of a husband? (w1lddeathh1)
21. In this kebele, do women bring dowry to marriage? (1 = Yes; 0 = No) (w1dowry1)
22. If yes what are the forms of dowry they bring to the marriage?
Land; (w1dowryform1)
Cash; (w1dowryform2)
Animal (ox, cow, goats or sheep); (w1dowryform3)
Other; (w1dowryform97)
23. Do you know about the process of land registration and title certification that is Going-on / took place in your kebele? (w1klcert1) (Yes = 1, No= 0, I have no idea about this = 888)
24. Did you participate in the kebele meetings that discuss about the process of land registration and title certification in your kebele? (Yes = 1, No= 0, I have no idea about this = 888) (w1lcertm1)
25. Have you ever been elected and served in the kebele land administration committee? (w1elect1) (Yes = 1, No= 0, I have no idea about this = 888)
26. Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? (Yes, I was present and consulted = 1; Yes, I was present but not consulted = 2; No, I was not there= 3; land not measured yet = 4) (w1survpres1)
27. If you have land in your name and you have/ get certificate of possession for it, do you think that the certificate will encourage you more to rent -OUT your plot of land? (1 = Yes ; 0 = No; 2 = I have no land in my name; 888 = I do not know about the future) (w1_rentcert1)
28. Will /has the land certification have any impact on your ability to negotiate whether or not you participate in land rental market? (1= Yes, it will improve my negotiation power; 0 = No impact at all; 888 = I do not know about it wait and see) (w1_rentcpart1)
29. How do you perceive/see the effect of land certification on women? (1 = It will enhance women's bargaining power within the household; 2 = It will have no effect on women; 3 = It could bring economic independence to women; 4 = I do not know about its effect yet) (w1_certperca1)
30. How do you perceive/see the effects of land rental market on women? (bw1_rentmark)
31. What type of land related disputes are the most common to women in your kebele?

Conflicting land claim following divorce; (**w1_attcona**)

Conflicting land claim following inheritance; (**w1_attconb**)

Boundary encroachment ; (**w1_attconc**)

Share-cropping and rental matters; (**w1_attcond**)

Other types of disputes; (**w1_attcone**)

32. What institutional arrangements are in place to assist women in case of dispute?

Arbitration by elders; (**w1_insta**)

Social court; (**w1_instb**)

Kebele/ woreda administration; (**w1_instc**)

Arbitration by relatives and parents of spouses; (**w1_instd**)

Women affairs organizations; (**w1_inste**)

33. What attributes most to dispute over land in the past?

Not having certificate/legal document; (**w1_conflicta**)

Unfair land redistribution; (**w1_conflictb**)

Refusal of husband to accept the spouse equal right to land; (**w1_conflictc**)

Refusal of community leaders/community to accept women equal right to land; (**w1_conflictd**)

Conflict because of inheritance; (**w1_conflictg**)

Conflict because of boundaries; (**w1_conflicth**)

34. Have you ever been involved in any kind of land dispute in the past two years? (1 = Yes; 0 = No)

(**w1_displ2y1**)

35. If yes, did you lose land due to that dispute? (1= Yes; 0 = No) (**w1_displ2ylose1**)

36. If yes to No. 35, what was the reason for the dispute and lose of your land? (**bw1_dispreas**)

37. Do you know and adequately understand the existing land laws that affect your life as farming household? (1 =Yes I know and understand them; 2 = Yes, I know but I do not understand them; 3 = I know very little; 4 = No, I have no idea about the land laws) (**bw1_understandlaw**) .

38. Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? (1 = Yes there are; 0 = No there are not; 3 = I do not know) (**w1_llawenf1**)

39. Do you think there are laws that adequately protect the land rights of women? (1 = Yes there are; 0 = No there are not; 3 = I do not know about this issue) (**w1_llawpw1**)

40. What was your perception about tenure security before land registration? (**bw1_pastperc**)

41. What are your current perception about tenure security? (**bw1_currperc**)

WIFE 2:

Enumerator: please ask the SECOND wife the following questions if the household is a POLYGAMY one (if more than one wife exists in a household).

6. How many plots of land does your household possess (exclude rented-IN and sharecropped-In plots)
(bw2_plotno)
7. Do you possess land in your name? (Yes = 1; No = 0) (bw2_possland)
8. If yes, do you have a certificate of title for the plot of land you possess? (bw2_poss-cert) (Yes = 1; No = 0;
9. If yes, what type of certificate is it? (1= First level 2= Second level 888= I don't know (bw2_certtype)
10. If yes, in what form is the certificate issued to you? (bw2_certform)
11. If certificate is obtained jointly, how is its joint nature confirmed? (bw2_jointconf)
12. .In your family is there any one married to more than one woman (1= Yes; 0 = No) (bw2_husband)
13. If your husband has MORE than one wife, do you think you have equal rights on land with his OTHER wife(s)? (Yes = 1, No= 0, I do not know about it = 888) (bw2_equal)
14. If your husband has more than one wife and there is a certificate for the land possessed by the household how is the certificate issued to the family? (bw2_husbcert)
15. If you have land in your name, who decides on what crops to grow on the land? (I myself = 1, my husband, = 2, I and my husband decide together =3) (bw2_deccrop)
16. If you possess land in your name, do you yourself make decisions regarding the use of the produce from the land? (Yes = 1, No= 0) (bw2_yourdec) .
17. If no, do you want to be allowed to make a decision regarding the use of the produce from the land? (Yes = 1, No= 0) (bw2_wantdec) . .
18. If you possess land in your name, can you rent-out/sharecrop-out when you want? (Yes = 1, No= 0) (bw2_rentou)
19. If yes to the above, do you make the decision by yourself? (Yes = 1, No= 0) (bw2_decrentout)
20. What is the current experience in this kebele in terms of sharing land in the event of divorce? (w2_lddiv1)
21. What experience exists currently in this kebele in terms of possession of land in the event of the death of a husband? (w2lddeathh1)
22. Do women bring dowry to marriage? (1 = Yes; 0 = No;) (w2dowry1)
23. If yes what are the forms of dowry they bring to the marriage?
Land; (w2dowryform1)

Cash; (**w2dowryform2**)

Animal (ox, cow, goats or sheep); (**w2dowryform3**)

Other; (**w2dowryform97**)

24. Do you know about the process of land registration and title certification that is Going-on / took place in your kebele? (Yes = 1, No= 0, I have no idea about this = 888) (**w2klcert1**)

25. Did you participate in the kebele meetings that discuss about the process of land registration and title certification in your kebele? (Yes = 1, No= 0, I have no idea about this = 888) (**w2lcertm1**)

26. Have you ever been elected and served in the kebele land administration committee? (Yes = 1, No= 0, I have no idea about this = 888) (**w2elect1**)

27. Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? (Yes, I was present and consulted = 1; Yes, I was present but not consulted = 2; No, I was not there= 3; land not measured yet = 4) (**w2survpres1**)

28. If you have land in your name and you have/ get certificate of possession for it, do you think that the certificate will encourage you more to rent -OUT your plot of land? (1 = Yes ; 0 = No; 2 = I have no land in my name; 888 = I do not know about the future) (**w2_rentcert1**)

29. Will /has the land certification have any impact on your ability to negotiate whether or not you participate in land rental market? (1= Yes, it will improve my negotiation power; 0 = No impact at all; 888= I do not know about it wait and see) (**w2_rentcpart1**)

30. How do you perceive/see the effect of land certification on women? (1 = It will enhance women's bargaining power within the household; 2 = It will have no effect on women; 3 = It could bring economic independence to women; 4 = I do not know about its effect yet) (**w2_certperca1**)

31. How do you perceive/see the effects of land rental market on women? (1= as the land market increases, I fear I will lose my user right to land; 2 = as the land market increases I believe I will benefit more; 3 = I do not foresee any effect on women; 888 = I have no idea about it) (**bw2_rentmark**)

32. What type of land related disputes are the most common to women in your kebele?

Conflicting land claim following divorce; (**w2_attcona**)

Conflicting land claim following inheritance; (**w2_attconb**)

Boundary encroachment ; (**w2_attconc**)

Share-cropping and rental matters; (**w2_attcond**)

33. What institutional arrangements are in place to assist women in case of dispute?

Arbitration by elders; (**w2_insta**)

Social court; (**w2_instb**)

Kebele/ woreda administration; (**w2_instc**)

Arbitration by relatives and parents of spouses; (**w2_instd**)

Women affairs organizations; (**w2_inste**)

34. What attributes most to dispute over land in the past?

Not having certificate/legal document; (**w2_conflicta**)

Unfair land redistribution; (**w2_conflictb**)

Refusal of husband to accept the spouse equal right to land; (**w2_conflictc**)

Refusal of community leaders/community to accept women equal right to land; (**w2_conflictd**)

Conflict because of inheritance; (**w2_conflictg**)

Conflict because of boundaries; (**w2_conflicth**)

35. Have you ever been involved in any kind of land dispute in the past two years? (1 = Yes; 0 = No)

(**w2_displ2y1**)

36. If yes, did you lose land due to that dispute? (1= Yes; 0 = No; 3 = issue still going on)

(**w2_displ2ylose1**)

37. If yes to No. 35, what was the reason for the dispute and lose of your land? (bw2_dispreas**)**

38. Do you know and adequately understand the existing land laws that affect your life as farming household? (1 =Yes I know and understand them; 2 = Yes, I know but I do not understand them; 3 = I know very little; 4 = No, I have no idea about the land laws) (bw2_understandlaw**)**

39. Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? (1 = Yes there are; 0 = No there are not; 888 = I do not know)) (w2_llawenf1**)**

40. Do you think there are laws that adequately protect the land rights of women? (1 = Yes there are; 0 = No there are not; 888 = I do not know about this issue) (w2_llawpw1**).**

41. What was your perception about tenure security before land registration? (bw2_pastperc**)**

42. What are your current perception about tenure security? (bw2_currperc**)**

EIFTRI and Cloudburst Consulting Group
Ethiopia Land Tenure Administration Program (ELTAP) and
Ethiopia Strengthening Land Administration Program (ELAP)
Endline Household Survey

A1.	Household ID (hh_id)	(Integer)	
A2.	Interviewer's Code	(Integer)	
A3.	Kebele (name of selected kebele) (PII)		
A4.	Region (killil)	<i>Tigray = 1 Amhara = 2</i> <i>Oromia = 3 SNNP = 4</i>	(Code)
A5.	Zone (zone)	(Code)	
A6.	Woreda (woreda)	(Code)	
	Name of the village (gox) (PII)		
	Location coordinates: Latitude (PII)		
	Location coordinates: Longitude (PII)		

Informed Consent

A7:	Do you consent to participate in this survey? (consent)	<i>Yes=1</i> <i>No=0 -> STOP</i>	(Code)
A8:	Respondent's full Name (PII)	(Text)	

Enumerator Note: in this questionnaire "during the last 24 months" refers to the time period from Yekatit 2005 to Tir 2007 in the Ethiopian Calendar and 'during last year' refers to the period from Yekatit 2006 to Tir 2007 in the Ethiopian Calendar

1. Demographic and Socio-economic Issues

Household Roster (List all members of the household)

Enumerator: I would now like to ask you some questions about the people who live in your household. When I say household, I am referring to 'a group of people who live in the same homestead (which may consist of more than a single dwelling) and share food or production. This includes people who are away temporarily away, like for school or herding, for less than 8 months of the year.

Enumerator: Start by listing the household head first and then list remaining members from oldest to youngest.

Name of HH member Text	Is this person the primary respondent for this interview? Yes =1 No = 0 <i>If 'Yes' do not ask THIS QUESTION for any additional members</i>	Sex Male =1 Female = 2 Prefer not to respond = 3	Age <i>In whole years (if age is 99 and above fill in 99)</i>	Marital Status (code) (complete if age>12)	Relationship to the household head (code)	Highest grade of schooling completed to date (complete if age>5_	Current primary economic activity (code) (complete if age > 7)	Current secondary economic activity (code) (complete if age > 7)
(PII)	1.02	1.03	1.04	1.05	1.06	1.07	1.08a	1.08b
(PII)	memint	sex	age	mstat	relhead	edu	econ1	econ2

Relationship to household head (relhead)		Educational Status (edu)	Marital Status (mstat)	Economic Activity (econ1, econ2)	
1 = Head 2 = Wife/Husband /Partner 3 = Son/daughter 4= Grandchild 5 = Father/Mother 6 = Sister-Brother 7 = Niece/Nephew 8 = Uncle/Aunt 9 = Son/Daughter-in-law	10 = Father/Mother-in-law 11 = Brother/Sister-in-law 12 = Grandparent 13 = Other relative of head or of his/her spouse 14=Servant (farm worker, herder, maid, etc.) 15= Other unrelated person 16= step son/step daughter	Illiterate=1 Read only=2 Read & write=3 Grade 4 complete =4 Grade 8 complete = 5 Grade 10-12 complete = 6 Above grade 12= 7	Unmarried/Never married=1 Married=2, Divorcee =3, Widower/ed=4, Cohabiting =5	1 = Farmer or family farm worker 2 = Domestic Work (incl. housewife) 3 = Manual worker 4= Tailor 5 = Weaver/thatcher 6 = Craftsworker/Potter 7 = Blacksmith/mason 8 = Foodseller 9 = Driver/Mechanic 10 = Skilled factory worker 11 = Teacher 12 = Health worker	13 = Part Official / Administrator / Clerical 14=Soldier 15= Trader 16= Disabled 17= Student 18= Looking for work/unemployed 19= Not in labor force / pensioner 20=Herding 21= Too young to work

1.09	<p>What TYPE of family is this household? (type_hh)</p> <p><i>Enumerator: Probe and code accordingly to match</i></p> <p><i>Monogamous = 1</i> <i>Polygamy type 'A' = 2</i> <i>Polygamy type 'B' = 3</i> <i>Polygamy type 'C' = 4</i> <i>Polygamy type 'D' = 5</i> <i>Female-headed household = 6</i> <i>Non-married male-headed household = 7</i></p> <p>If sexhead=2 enter code=6 and STOP</p> <p>Q- How many wives does the household head have? -> if '0' and (msthead=1 and sexhead=1) enter code=7 and STOP -> if '1' enter code=1 and STOP</p> <p>Q - Do all of the wives live in the same house? -> if 'yes' code=2 and STOP</p> <p>Q - Do wives live in separate houses but share household food and land resources? -> if 'yes' code=3 and STOP</p> <p>Q - Do wives live in different kebeles? -> if 'yes' code=5 and STOP</p> <p>otherwise enter code=4</p> <p>Note: A household is Monogamous when there is a single wife; polygamy type 'A' when more than 1 wife but all wives live as a single household feeding from same production; polygamy type 'B' when more than 1 wife but wives live in their own houses but share food from the production from same land ; polygamy type 'C' when more than 1 wife but other wives than the primary one live independently on their own land and production; polygamy type 'D' when more than 1 wife but other wives than the primary one live outside the kebele of a husband.</p>	(Code)
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2. Land Possession and Land Use

Household Land Parcel Roster

Enumerator: ask the interviewee about the land that is currently owned by members of the household (the number of land parcels he currently owns, the size of the parcels, how these were acquired, and when, etc.).

Parcel	Name of the place where the parcel is found. <i>Text description of where parcel is located</i>	Area of parcel in local units <i>(no.)</i>	Name local area unit <i>(see codes)</i>	Distance from homestead to parcel ONE-WAY and direction of parcel from homestead			How was it originally acquired? <i>1 = inherited 2 = OFFICIAL land redistribution 3 = gift 4 = bought from others 5 = from shigishig 6 = given by kebele as a replacement 7 = reclaimed from forest/pasture land 8 = got through marriage 9 = got as exchange for a parcel of land 21 = divorce settlement 22 = other legal settlement 10 = (other)</i>	When was it acquired? <i>(year in EC)</i>	Who possesses the parcel? <i>(see codes)</i>	Who decides on the crop (s) to grow? <i>(see codes)</i>	Who decides on the use of produce from the land? <i>(see codes)</i>	Who decides on the transfer (rent/sharecropping-OUT) to others? <i>(see codes)</i>
				Time to walk ONE-WAY <i>(in minutes)</i>	Walking distance ONE-WAY <i>(in meters)</i>	Direction <i>(see codes)</i>						
	(PII)	2.02	2.03	2.04a	2.04b	2.04c	2.05	2.06	2.07	2.08	2.09	2.10
	(PII)	parclu_2	parclunm_2	parcmin	parcdist	parcdir	parchow_2	parcwhn_2	parcown_2	parcdcrop_2	parcduse_2	parcrout_2
1												
2												
3												

Local area measurement unit codes (parclunm)		Possession and decision response codes (parcown, parcdcrop, parcduse, parcdrent)		Direction of parcel from primary household dwelling codes (parcdir)
1 = Timad 2 = Qert 3 = Gemed 4 = Square meter 5 = Gezmi 6 = Kelad 7 = Keda	8 = Goro 9 = Segnii 10 = Frechassa 11 = Gibir 12 = Tilm 13 = Hectare 110 = Other (specify)	1 = Husband 2 = Wife 3 = Husband & wife 4 = Children	5 = whole family 6 = single HH head 7 = Renter or sharecropper 8 = Other (please specify)	1 = North 2 = North East 3 = East (sunrise) 4 = South East 5 = South 6 = South West 7 = West (sunset) 8 = North West 10 = Homestead

Household Land Use

Enumerator: This series of questions will ask how you use each of the parcels owned by members of the household. For each parcel, please indicate the area of each type of land use category during last year (i.e. the period from Yekatit 2006 to Tir 2007 in the Ethiopian Calendar)

	ANNUAL Crop Production		PERENNIAL Crop Production		GARDEN Crop Production		OWN Pastureland		MAN-MADE tree lot		NATURALLY grown and PROTECTED trees		FALLOW land temporarily not cultivated	
Parcel	Area in local units <i>If '0' skip to (pecra)</i>	Unit <i>(see codes)</i>	Area in local units <i>If '0' skip to (gdcra)</i>	Unit <i>(see codes)</i>	Area in local units <i>If '0' skip to (ownpa)</i>	Unit <i>(see codes)</i>	Area in local units <i>If '0' skip to (mmta)</i>	Unit <i>(see codes)</i>	Area in local units <i>If '0' skip to (ngpta)</i>	Unit <i>(see codes)</i>	Area in local units <i>If '0' skip to (falla)</i>	Unit <i>(see codes)</i>	Area in local units <i>If '0' skip to Next parcel</i>	Unit <i>(see codes)</i>
	2.11a	2.11b	2.12a	2.12b	2.13a	2.13b	2.14a	2.14b	2.15a	2.15b	2.16a	2.16b	2.17a	2.17b
	ancra	ancrau	pecra	pecrau	gdcra	gdcrau	ownpa	ownpau	mmta	mmtau	ngpta	ngptau	falla	fallau
1														
2														
3														
4														
5														

2.18	Does your household possess land in urban areas or kebeles surrounding urban areas? (urbparc)	<i>Yes = 1</i> <i>No = 0</i>	(Code)
2.19	Does your household use a COMMON pastureland? (cpasl)	<i>Yes = 1</i> <i>No = 0</i>	(Code)

Local area measurement unit codes	
1 = Timad 2 = Qert 3 = Gemed 4 = Square meter 5 = Gezm 6 = Kelad 7 = Keda	8 = Goro 9 = Segnii 10 = Frechassa 11 = Gibir 12 = Tilm 13 = Hectare

3. Land registration and certification

Enumerator: The following questions deal with the land administration office and land administration programs in your area.

(PII)	Where is the nearest land administration/land registry office located that you would go to if you needed to register a change in your land holdings?	(text)	
3.01	If traveling to the land administration/land registry office, what major mode of transportation would you likely use? (lofftrmode) <i>1= on foot</i> <i>2= bicycle</i> <i>3= motorcycle</i> <i>4=tricycle (bajaj)</i> <i>5= car</i> <i>6= horse or mule</i> <i>7= cart (horse/mule/donkey)</i> <i>8= public transport/bus</i> <i>97= other (specify)</i>	(code)	
3.02	Approximately how long would it take to travel ONE-WAY from your home to the land administration office in minutes ? (lofftrtime)	(numeric)	
3.03	Using the mode of transport indicated above, approximately how many KILOMETERS is it from your home to the land administration office? (loffdist)	(numeric)	
3.05	What would be the total out-of-pocket COSTS associated with traveling from your home to the land administration office and then back home again in BIRR? Include any incidental fees like food, lodging, or costs of using public transportation. (loffexp)	(numeric)fre	

Enumerator: Use photo or digital image to show examples of: i) 1st level certificate/book of holding; and ii) 2nd level certificate/book of holding.

3.1 Certification of household parcels

Parcel	Has this parcel been surveyed OR certified as part of a land certification or registration program? Yes =1 No = 0 <i>If 'No' skip to next parcel</i>	Do you have a 1st level certificate for this parcel?				Has this parcel been surveyed for 2nd level certification?		Do you have a 2nd level certificate for this parcel? (use photo or digital image to show example of 2 nd level certificate/book of holding)			
		Yes =1 No = 0	If yes, when did you receive a 1st certificate for this parcel? (Year in EC)	Who has certificate for the parcel? (see codes)	How was joint certification confirmed?	Yes =1 No = 0	If yes, when did the 2nd level survey take place for this parcel? (Year in EC)	Yes =1 No = 0 <i>If 'No' skip to parc1</i>	When did you receive a 2nd level certificate for this parcel? (Year in EC)	Who has certificate for the parcel? (see codes)	How was joint certification confirmed? [Complete if parc2who=3] (see codes below)
	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	3.11
	parcreg	parcb1	parc1yr	parc1who	parc1jver	parc2sur	parc2suryr	parc2cer	parc2yr	parc2who	parc2jver
1											
2											
3											
4											
5											

Possession and decision response codes (parc1who, parc2who)	Confirmation of joint ownership (parc1jver, parc2jver)
1 = Husband 2 = Wife 3 = Husband & wife 4 = Children 5 = whole family 6 = single HH head	1 = Pictures of both spouses attached 2 = Names and signatures of both entered as certificate holders 3 = Names of both entered as certificate holders 4 = Name of wife entered as one of the household members 97 = Other

3.3 Reductions in household land holdings

3.21	Has your household ever lost land due to OFFICIAL land redistribution? (redland) <i>Enumerator: the last OFFICIAL land redistribution should have taken no later than year 1989 in EC</i>	Yes =1 No = 0 if 'No' skip to (lland)	(Code)
3.25	If yes, when? Year in EC (redlandyr) <i>Enumerator: the last OFFICIAL land redistribution should have taken no later than year 1989 in EC</i>		(Integer)

Enumerator: This set of questions involves DECREASES in household land holdings SINCE 1999 in Ethiopian Calendar (May 2007 in Western calendar):

3.24	Has there been a decrease in your household land holdings since 1999 in Ethiopian Calendar (2007 in Gregorian)? (ldic)	Yes =1 No = 0 If 'No' skip to Section 4	(Code)
3.23	Gift of land to other individuals who are not currently members of the household since 1999? (giftland)	Yes =1 No = 0 if 'No' skip to (lland)	(Code)
3.27a	If yes, when?	Year of most recent (giftland_yr1)	(Integer)
3.27b		Year of second most recent (giftland_yr2)	(Integer)
3.28	For the most recent instance, have you taken steps to update this formally at the land administration office? (giftland_reg)	Yes =1 No = 0 if 'No' skip to (lland)	(Code)
3.28b	If yes, when? Year in EC (giftland_regyr)		(Integer)
3.29	How many trips to the land administration office were necessary to register the change? (number of round trips for the most recent gift) (giftlandt)		(Integer)
3.30	Has your household lost land, e.g. expropriation of part of the land for public purposes or for investors, etc. If yes, list other reason. (lland) <i>Enumerator: Probe and code appropriately</i>	Yes =1 No = 0 if 'No' skip to next section	(Code)
3.31	When did this happen? Year in EC (llandyr)		(Integer)

3.32	<p>What was the land taken from you used for? (llanduse)</p> <p><i>Enumerator: Probe and code appropriately</i></p>	<p>1= Local (i.e., within the woreda) investors/farming</p> <p>2= Non-local private investment (agribusiness)</p> <p>3= Public infrastructure (roads, schools, conservation areas, etc.)</p> <p>97= Other (specify)</p>	(Code)
3.33	<p>Have you informed the kebele administration about the change (s)? (llandinfk2)</p>	<p>Yes =1</p> <p>No = 0</p>	(Code)
3.34	<p>Has the change been registered in the household's certificate of holding? (llandreg)</p>	<p>Yes =1</p> <p>No = 0</p>	(Code)

Enumerator: The next set questions involves your household's rental and sharecropping activities during the LAST YEAR on land owned by the household. (i.e. the period from Yekatit 2006 to Tir 2007 in the Ethiopian Calendar.)

4.01	Does your household possess land this is rented/shared-OUT IN THE PAST SEASON? (rentout2)	Yes = 1 No = 0	(Code)
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Local area measurement unit codes (poutlunm)	
1 = <i>Timad</i>	8 = <i>Goro</i>
2 = <i>Qert</i>	9 = <i>Segnii</i>
3 = <i>Gemed</i>	10 = <i>Frechassa</i>
4 = <i>Square meter</i>	11 = <i>Gibir</i>
5 = <i>Gezm</i>	12 = <i>Tilm</i>
6 = <i>Kelad</i>	13 = <i>Hectare</i>
7 = <i>Keda</i>	110 = <i>Other (specify)</i>

[illegible]

Enumerator: This section refers to renting-OUT/sharecropped-OUT land owned by the household IN THE LAST 2 YEARS (i.e. the time period from Yekatit 2005 to Tir 2007 in the Ethiopian Calendar). This applies to land rented-OUT in the past season in addition to land rented-OUT going back TWO YEARS (24 months).

**NOTE to enumerator: any parcel indicated as being rented-out in the previous table (pout=1) should also be indicated as being rented-OUT here.*

	Has the household transferred any of its parcels on the basis of UNSPECIFIED long term arrangements (lease, mortgage / woled-aghed, etc.) during the last 24 calendar months? <i>Yes =1 No = 0</i>	Has the household rented-OUT parcel [parcid] on the basis of monetary rent payment or sharecropping in kind during the last 24 calendar months? <i>Yes =1 No = 0 If 'No' skip to next parcel</i>	Is the total area of this parcel as reported [in the land roster] being rented / shared-OUT during the last 24 calendar months? <i>Yes =1 No = 0 if 'Yes' skip to next parcel</i>	Area of parcel in local units	Name local area unit <i>(see codes)</i>
	4.10	4.11	4.12	4.13a	4.13b
	pltout	poutmon	poutrost	poutarea	poutlub
1					
2					
3					
4					
5					

Local area measurement unit codes (parclu)	
<i>1 = Timad</i>	<i>8 = Goro</i>
<i>2 = Qert</i>	<i>9 = Segnii</i>
<i>3 = Gemed</i>	<i>10 = Frechassa</i>
<i>4= Square meter</i>	<i>11 = Gibir</i>
<i>5 = Gezm</i>	<i>12 = Tilm</i>
<i>6 = Kelad</i>	<i>13 = Hectare</i>
<i>7 = Keda</i>	

4.2 Land rented-IN by the household

Enumerator: This section refers to land that is currently rented-IN/sharecropped by the household

4.22	Has your household rented/shared-IN land IN THE PAST SEASON? (rentin2)	Yes =1 No = 0	(Code)
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Rent IN parcel	What is the area of the parcel rented/ shared? <i>(In local units)</i>	Name local area unit <i>(see codes below)</i>	Was the other spouse consulted beforehand? [Complete if msthead = 2] Yes =1 No = 0	Where is/are the HH(s)/individual(s) from whom your HH rented/shared- IN? <i>same gott =1 same Kebele= 2 same Woreda = 3 same Zone = 4 same Region = 5 outside of the Region = 6</i> <i>(* enumerator: indicate the lowest applicable administrative unit)</i>	With whom has your household entered into an agreement of land renting/sharing- IN? <i>A relative = 1 A close friend = 2 A person/household that is neither relative nor a friend = 3 Others (specify) = 4</i>	Why does your household rent-IN/share-IN land? <i>Shortage of land=1 Excess labor=2 As swap for a distant parcel= 3 Others (specify)=4</i> <i>(Indicate up to three reasons.)</i>		
						Reason 1	Reason 2	Reason 3
4.2.3a	4.2.3	4.2.4	4.2.5	4.2.6	4.2.7	4.2.8a	4.2.8b	4.2.8c
	prina	prinlu	prinsp	prinloc	prinwho	preason1	prinr2	prinr3
101								
102								
103								
104								

Local area measurement unit codes (parclu)	
1 = Timad	8 = Goro
2 = Qert	9 = Segnii
3 = Gemed	10 = Frechassa
4= Square meter	11 = Gibir
5 = Gezm	12 = Tilm
6 = Kelad 7 = Keda	13 = Hectare

Enumerator: This is a continuation of previous page on renting –IN/sharecropped-IN land by the household.

Rent IN parcel	For how many years is this renting-IN arrangement? <i>(indicate number of years of the agreement, if no fixed term enter '99')</i>	What is the type of contract? <i>Written = 1 Oral with witness = 2 Oral without witness = 3 Other (specify) = 97</i>	Is the contract registered with the land administration? <i>Yes =1 No = 0</i>	What is the type of arrangement? <i>Cash/ In-kind= 1 Sharecropping = 2</i>	How much did your household pay in land RENT for the land rented-IN during the last 12 months?			
					Monetary payment	In-kind payment	Percentage of production given	Estimated value of production given
					<i>Birr</i>	<i>(Birr - est value)</i>	<i>Ask if prinr=2</i>	<i>(Birr - est value) Ask if prinr=2</i>
	4.2.9	4.2.10	4.2.11	4.2.12	4.2.13	4.2.14	4.2.15	4.2.16
	prinyrs	printype	prinreg	prinr	prin12b	prin12ik	prinrp	prinrv
101								
102								
103								
104								
105								

4.3.2	Has the household obtained any parcel(s) from others on the basis of UNSPECIFIED long term Arrangements (lease, mortgage / woled-aghed, etc.) during the last 24 calendar months? (printlease2)	<i>Yes =1 No = 0</i>
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4.3 Land Use on Rented-IN Land

Enumerator: This series of questions will ask how you use each of the parcels RENTED-IN/Sharecropped-IN by the household. For each parcel, please indicate the area of each type of land use category during LAST YEAR (i.e. the period from Yekatit 2006 to Tir 2007 in the Ethiopian Calendar.)

Rent IN parcel	ANNUAL Crop Production		PERENNIAL Crop Production		GARDEN Crop Production		OWN Pastureland (for own use)		MAN-MADE tree lot		NATURALLY grown and PROTECTED trees		FALLOW land temporarily not cultivated	
	Area in local units If '0' skip to rancrau	Unit (see codes)	Area in local units If '0' skip to rgdcra	Unit (see codes)	Area in local units If '0' skip to rownpa	Unit (see codes)	Area in local units If '0' skip to rmmta	Unit (see codes)	Area in local units If '0' skip to rngpta	Unit (see codes)	Area in local units If '0' skip to rfalla	Unit (see codes)	Area in local units If '0' skip to next parcel	Unit (see codes)
	4.3.1a	4.3.1b	4.3.2a	4.3.2b	4.3.3a	4.3.3b	4.3.4a	4.3.4b	4.3.4a	4.3.4b	4.3.5a	4.3.5b	4.3.6a	4.3.6b
	rancrau	rancrau	rpecra	rpecrau	rgdcra	rgdcrau	rownpa	rownpau	rmmta	rmmtau	rngpta	rngptau	rfalla	rfallau
101														
102														
103														
104														

Local area measurement unit codes	
1 = Timad	8 = Goro
2 = Qert	9 = Segnii
3 = Gemed	10 = Frechassa
4 = Square meter	11 = Gibir
5 = Gezm	12 = Tilm
6 = Kelad	13 = Hectare
7 = Keda	

5. Land Related Disputes

Enumerator: This set of questions is in regards to any disputes you may have had over land during LAST 2 YEARS (i.e. the time period from Yekatit 2005 to Tir 2007 in the Ethiopian Calendar) on land OWNED by the household.

5.1	During the LAST 2 YEARS (24 MONTHS), was your household involved in any land related disagreements? (dispute2)	Yes =1 No = 0	(code)
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* NOTE to Enumerator: Land related disagreements here, DO NOT include disagreements regarding afelama, (i.e., grazing one's animals on somebody else's crop or pasture). If there are more than 2 disagreements, ask about the 2 MOST SERIOUS.

Parcel ID	During the LAST 2 YEARS (24 MONTHS), was your household involved in any land related disagreements on {parcel ID}? Yes =1 No = 0 If No, Skip to next parcel	Disagreement 1								Disagreement 2						
		What type of land related dispute? (probe and code using type of dispute codes)	How serious was this dispute? (code)	Was the dispute resolved? Yes =1 No = 0	How was it finally resolved? Ask if disp1res=1 (code)	How long did it take to resolve the dispute? (in months) Ask in disp1res=1	Where was the dispute referred to? Ask if disp1res=0	For how long has this dispute been under deliberation? (in months) Ask if disp1res=0	Have you been involved in any other land related disagreements? Yes =1 No = 0	What type of land related dispute? (probe and code using type of dispute codes)	How serious was this dispute? (code)	Was it resolved? Yes =1 No = 0	How was it finally resolved? (code)	How long did it take to resolve the dispute? Ask if disp2res=1 (in months)	Where was the dispute referred to? Ask if disp2res=0	For how long has this dispute been under deliberation? Ask if disp2res=0
	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	5.12	5.13	5.14	5.15	5.16	5.17
	disp	dispb	disp1s	disp1res	disp1how	disp1mo	disp1ref	disp1mor	filitera	dispc	disp2s	disp2res	disp2how	disp2mo	disp2ref	disp2mor
1																
2																
3																

Type of disagreement codes
(disp1, disp2)

Disagreement resolution method codes
(disp1how, disp2how, disp1ref, disp2ref)

Degree of seriousness codes
(disp1s, disp2s)

<p>1= Yegebagnal, i.e., conflicting land claims by non-family members</p> <p>2= Yegebagnal, i.e., conflicting land claims following divorce</p> <p>3= Yegebagnal, i.e., conflicting land claims related to inheritance</p> <p>4= Boundary / encroachment matters</p> <p>5= Conflict that arises from exchange of parcels of land</p> <p>6= Conflict that arises in relation to access to road</p> <p>7= Conflict that arises in relation to water (flood) transfer</p> <p>8= Sharecropping and rental matters</p> <p>9= Others (specify)</p>	<p>1= Formal court</p> <p>2= Shimagele, i.e., Elders council</p> <p>3= Family's, relatives' or kin-group's internal mechanism</p> <p>4= kebele administration</p> <p>5=woreda administration</p> <p>6= Others (specify)</p> <p>7= Not referred</p>	<p>1= Very serious</p> <p>2= Serious</p> <p>3= Somewhat serious</p> <p>4= Not serious</p>
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Enumerator: This set of questions deals with how you may be using your land to help you obtain credit during the LAST 2 YEARS (i.e. the time period from Yekatit 2005 to Tir 2007 in the Ethiopian Calendar).

6.01	Did you obtain credit (formal or informal) during the LAST 2 YEARS? (cred)	Yes = 1 No = 0 If 'No' skip to Section 7	(Code)
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The next set of questions refers to up to the 6 MOST RECENT instances of credit obtained.

[illegible]

7. Awareness of Land rights

Enumerator: These questions relate to land registration activities that may have taken place in your kebele.

7.01	Are you aware of any land registration and title certification that has or is currently taking place in your kebele? (h1klcert) If '0' or '888' skip to Section 3.	<i>Yes = 1 No = 0</i> <i>I have no idea about this = 888</i>	(Code)
7.02	If yes, when did the process of land registration and title certification begin in your kebele for the most recent program? (h1klcertyr)	<i>year in EC</i>	(Numeric)
7.03	Did you participate in any kebele meetings that discussed the process of land certification in your kebele? (h1lcertm)	<i>Yes=1 No= 0</i> <i>I have no idea about this = 888</i>	(Code)
7.04	If yes, when did you first participate in the kebele meetings that discussed the process of land certification in your kebele? (h1lcertmyr)	<i>year in EC</i>	(Numeric)
7.05	Have you ever been elected and served in the kebele land administration committee? (h1elect)	<i>Yes = 1 No= 0</i> <i>I have no idea about this = 888</i> <i>if '0' or '888' skip to w1survpres</i>	(Code)
7.06	If yes, when were you first elected to serve on the kebele land administration committee? (h1electyr)	<i>year in EC</i>	(Numeric)
7.07	Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? (h1survpres)	<i>Yes, I was present and consulted = 1</i> <i>Yes, I was present but not consulted = 2</i> <i>No, I was not there= 3</i> <i>Land not measured yet = 4</i> <i>if 4, skip to next segment</i>	(Code)
7.08	When did the surveyors first come to measure your (also household's) land? (h1survpresyr)	<i>year in EC</i>	(Numeric)

Enumerator: Now, I am going to ask you some questions about how land is dealt with in different family situations

7.09	In this kebele, in the event of divorce, how is land shared between the husband and spouse? (h1_lddiv) Enumerator: Probe and code, select appropriate answer choice.	<i>Both spouses share the land equally despite who contributed land to the marriage =1</i> <i>The husband retains all the land under the HH possession =2</i> <i>Each spouse takes only the plot they contributed to the marriage = 3</i> <i>The wife will retain all the plots under the HH possession = 4</i> <i>I do not know/have no experience about it = 888</i>	(Code)
7.10	In this kebele, in the event of the death of a husband, how is land divided among family members? (h1lddeathh) Enumerator: Probe and code, select appropriate answer choice.	<i>The wife and children will inherit the land =1</i> <i>The wife will inherit all the land =2</i> <i>All the children will share the land equally =3</i> <i>Only male children inherit the land = 4</i> <i>The relatives (not wife or children) of the diseased inherit the land = 5</i> <i>Others (specify)=97</i> <i>I do not know =888</i>	(Code)

7.11	Is there any communal pasture land in your kebele? (comlnd_keb)	Yes =1 No = 0 if 'No' skip to (comflnd_keb)	(Code)
7.12	What type of rights do you have on the communal pasture land in your kebele? (comlnd_right)	Use right=1 The right to transfer to others through rent=2 No right=3 Others (specify)=97	(Code)
7.13	Do you think that you will lose your existing rights on communal pasture land in the future? (comlnd_losef)	Yes =1 No = 0	(Code)
7.14	If yes, why do you think you will lose your existing rights on communal pasture land in the future? (comlnd_loseu) Enumerator: Probe and code	1= People who own farmland next to the communal land will encroach on the communal land 2= Powerful individuals from the nearest town will take over control of the communal land 3= The government will allocate the communal land to an investor 4= Other (please specify)	(Code)
7.15	Is there any communal forest land in your kebele? (comflnd_keb)	Yes =1 No = 0 if 'No' skip to Section 7	(Code)
7.16	What type of rights do you have on the communal forest land in your kebele? (if any) (comflnd_right)	Use right=1 The right to transfer to others through rent=2 No right=3	(Code)
7.17	Do you think that you will lose your existing rights on communal forest land in the future? (comflnd_losef)	Yes =1 No = 0	(Code)
7.18	If yes, why do you think you will lose your existing rights on communal forest land in the future? (comflnd_loseu)	1= People who own farmland next to the communal land will encroach on the communal land 2= Powerful/influential local individuals will take over control of the communal land 3= The government will allocate the communal land to an investor 4= Other (please specify)	(Code)

Section 7. (Cont.) Willingness to pay for land certification, willingness to rent-out land, land use rights, and future land use

Enumerator: The following set of questions asks what you would be willing to pay for documentation to legally verify your rights to land owned by your household. In response to each of these questions indicate the maximum you would be willing to pay.

7.19	Suppose you did not have any land certification or legal documentation verifying the land owned by your household, what would be the maximum amount that you would be willing to pay to obtain a document verifying your households lands (for all parcels)? wpnewcert	Amount in Birr (if nothing enter '0')	(Code)
7.20	Suppose you were to lose your land certificate documents, what would be the maximum amount that you would be willing to pay in order to get a replacement? wplostcert	Amount in Birr (if nothing enter '0')	(Code)

7.21	If you were to transfer ownership of one or more parcels to a close family member (inside or outside this household) or to a close friend, how much would you be willing to pay to have your land certification documentation updated to reflect this change? wptrans	<div> <div>Amount in Birr (if nothing enter '0')</div> <div>(Code)</div> </div>
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7.2 Willingness to rent-out land

Enumerator: The following questions refer to the amount that a household would be willing to receive for renting-out each of their parcels for a single year (for example, from Yekatit 2007 to Tir 2008). Assume that this is a fixed rental agreement and is based on cash only (i.e. this hypothetical example does not allow include sharecropping arrangements).

Parcel	<p>What would be the minimum amount of money you are willing to accept in order to rent out this plot of land per year (assume this is a fixed rental arrangement)</p> <p><i>(amount in birr per year)</i></p> <p><i>If would not be willing to rent-out this parcel under any circumstances enter '997'</i></p>
	7.22
	wtrrentout
1	
2	
3	
4	

7.3 Current land rights

Enumerator: The following set of questions asks what types of rights you have for different parcels of land.

Parcel	What type of right do you have on the land under your possession? (check boxes as appropriate)						
	Right to use	Right to contract/ rent/ share-out	Heritable right	Right to sell	Right to use it as collateral to get credit	I do not know my right	Others (specify)
	7.23a	7.23b	7.23c	7.23d	7.23e	7.23f	7.23g
	parcruse	porcrout	parcrher	parcrsel	parcrcol	parcrunk	parcoth
1							
2							
3							
4							
5							

7.4 Future use

Enumerator: The following set of questions asks how you plan to use your land in the future.

Parcel	What would you like to do with the farm land under your possession in the future? (check boxes as appropriate)					
	Continue to use in the same way as in the past (i.e. producing the same crops, using the same methods, etc.)	Make more investment in farming	Rent-out the land	Live in town but continue farming	If allowed I will sell the land	Others (specify)
	7.24a	7.24b	7.24c	7.24d	7.24e	7.24f
	parc_fusea	parc_fuseb	parc_fusec	parc_fused	parc_fusee	parc_fusef
1						
2						
3						
4						
5						
6						
7						

7.5 Perceptions of Ownership of Secure and Full Usufruct Rights

Enumerator: The next set of questions collects information on how secure feel in your rights to use your land. I will read a statement and then ask you whether you: strongly agree, agree, disagree, or strongly disagree with that statement.

7.51	I believe that a redistribution of land is likely to take place in my Kebele in the near future (redist_risk2)	Strongly Believe=1 Believe=2 Do not Believe=3 Strongly do not Believe=4	(Code)
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7.52	I believe that the land that is currently under my, my wife, and my children's possession will remain within my control or that of my wife/husband or that of my children's during the coming FIFTEEN (15) YEARS. (inherit_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)
7.53	I am fully convinced that I will stand to benefit in the future from whatever soil and/or water conservation measures I may undertake on my land at present. (conserv_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)
7.54	I am fully convinced that I will NOT stand to benefit in the future from trees that I may plant on my land at present. (tree_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)
7.55	I feel that renting OUT my land for money or on sharecropping basis EVEN FOR ONE (1) CROPPING SEASON is a risky business that I should avoid unless I have no other options of overcoming my difficulties. (rentin1_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)
7.56	I feel that renting OUT my land for money or on sharecropping basis FOR FIVE (5) CROPPING SEASONS is a risky business that I should avoid unless I have no other options of overcoming my difficulties. (rentin5_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)
7.57	I would not be running any risk whatsoever if I rent IN land for money or on a sharecropping FOR ONE (1) CROPPING SEASON. (rentout1_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)
7.58	I would not be running any risk whatsoever if I rent IN land for money or on a sharecropping FOR FIVE (5) CROPPING SEASONS. (rentout5_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)

Enumerator: The next set of questions collects information on your perceptions of land certificate programs.

7.59	I DO NOT believe that having a Certificate of Possession guarantees security over one's land. (certposs_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)
7.60	I will feel more secure to enter into any sort of business transaction involving credit if it were with a farmer who HAS a Certificate of Possession over his land than that a farmer who does NOT have a Certificate. (certbiz_risk2)	Strongly Agree=1 Agree=2 Disagree=3 Strongly Disagree=4	(Code)

7.61a-d	Do you think a land certificate program will have a positive impact on the following :		
	Tenure security (i.e improve tenure security) (certimp_tsec2)	Yes=1 No=0 I don't know=888	(Code)
	Investment on land (i.e. will increase investment in productivity improving machinery) (certimp_Indinv2)	Yes=1 No=0 I don't know=888	(Code)
	Land renting (i.e. will make renting land easier and more active) (certimp_Indrent2)	Yes=1 No=0 I don't know=888	(Code)
	Access to credit (i.e. will increase access to credit whether through formal means such as banks or informal means such as microfinance) (certimp_credit2)	Yes=1 No=0 I don't know=888	(Code)

7.62a-e	How do you perceive/see the effect of land certification on women? (certpercw)	<i>It will enhance women's bargaining power within the household (certpercw1a)</i> <i>Yes=1, No=0</i>	(Code)
	<i>Enumerator: Read responses, probe and code selecting all that apply.</i>	<i>It could bring economic independence to women (certpercw2a)</i> <i>Yes=1, No=0</i>	(Code)
		<i>Other perceived effects? (certpercw3a)</i> <i>Yes=1, No=0</i>	(Code)
		<i>I do not know about its effect yet (certpercw4a)</i> <i>Yes=1, No=0</i>	(Code)
		<i>It will have no effect on women (certpercw5a)</i> <i>Yes=1, No=0</i>	(Code)
7.63	Do you think there are laws that adequately protect the land rights of women? (llawpw)	<i>Yes there are=1</i> <i>No there are not=2</i> <i>I do not know about this issue=3</i>	(Code)
7.64	Do you think women should have the same rights as men when it comes to making decisions about how land is used? (lpercdecw)	<i>Yes, in all respects =1</i> <i>No =0</i> <i>Yes, but men should have more say in long-term decisions (i.e. long-term investments such as in trees or soil conservation) = 3</i> <i>Yes, but women should have more say in long-term decisions (i.e. long-term investments such as in trees or soil conservation) = 4</i> <i>Yes, but men should have more say in short-term decisions (i.e. renting-out/sharecropping-out land) = 5</i> <i>Yes, but women should have more say in short-term decisions (i.e. renting-out/sharecropping-out land) = 6</i> <i>I choose not to respond = 999</i>	(Code)
7.67	Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? (llawenf2)	<i>Yes there are=1</i> <i>No there are not=0</i> <i>I do not know=888</i>	(Code)

8. Soil and Water Conservation Measures

Enumerator: The next set of questions refers to soil and water conservation measures you have taken on your land (i.e. land that is OWNED by your household – this DOES NOT include land that is rented-IN).

8.01	Does your household have parcels located on sloping lands where soil erosion caused by water is a problem? (water_erosion2)	Yes=1 No=0	(Code)
8.02	Is any of the land owned by your household located in a 'critical watershed'? (critwshed2)	1=Yes 2=No 3=Not sure	(Code)
8.03	Have you ever been required by the woreda/kebele government to implement water conservation measures on any of the land owned by your household? (reqwatercons)	1=Yes 2=No 3=Not sure	(Code)
8.04	What is the length of SOIL BUNDS constructed (in meters) by the household ITSELF (using its own resources) to date on existing land owned by the household? (soilbund_hh2)		(Numeric)
8.05	What is the length of SOIL BUNDS constructed (in meters) by or with the HELP OF OTHERS (GOs, NGOs, CBOs) but maintained/protected by the HH to date and existing on land owned by the household? (soilbnd_othr2)		(Numeric)
8.06	Length of STONE BUNDS constructed (in meters) by the household ITSELF (using its own resources) to date and existing on land owned by the household. (stonebund_hh2)		(Numeric)
8.07	What is the length of STONE BUNDS constructed (in meters) by or with the HELP OF OTHERS (GOs, NGOs, CBOs) but maintained/protected by the HH to date and existing on land owned by the household. (stonbnd_othr2)		(Numeric)
8.08	What is the length of HEDGES constructed (in meters) by the household ITSELF (using its own resources) to date and existing on land owned by the household. (hedges_hh2)		(Numeric)
8.09	What is the length of HEDGES constructed (in meters) by or with the HELP OF OTHERS (GOs, NGOs, CBOs) but maintained/protected by the HH to date and existing on land owned by the household. (hedges_othr2)		(Numeric)
8.10	What is the length of VEGETATION/TRASH LINES constructed (in meters) by the household ITSELF (using its own resources) to date and existing on land owned by the household. (vegline_hh2)		(Numeric)
8.11	What is the length of VEGETATION/TRASH LINES constructed (in meters) by or with the HELP OF OTHERS (GOs, NGOs, CBOs) but maintained/protected by the HH to date and existing on land owned by the household. (vegline_othr2)		(Numeric)
8.12	What is the length of SOIL DITCHES (<i>dichira</i>) constructed (in meters) by the household ITSELF (using its own resources) to date and existing on land owned by the household. (soilditch_hh2)		(Numeric)
8.13	What is the length of SOIL DITCHES (<i>dichira</i>) constructed (in meters) by or with the HELP OF OTHERS (GOs, NGOs, CBOs) but maintained/protected by the HH to date and existing on land owned by the household. (soilditch_othr2)		(Numeric)
8.14	What is the length of SOIL BUNDS STABILIZED by planting grasses, trees or bushes on them (in meters) practiced by the household ITSELF (using its own resources) to date and existing on land owned by the household. (bndgrass_hh2)		(Numeric)
8.15	What is the length of SOIL BUNDS STABILIZED by planting grasses, trees or bushes on them (in meters) practiced by the household WITH THE SUPPORT of GOs, NGOs, CBOs, to date and existing on land owned by the household. (bndgrass_othr2)		(Numeric)
8.16	Does the household use IRRIGATION during dry season for production of annual/perennial crops on land owned by the household? (irrigation2)	Yes=1 No=0	(Code)
8.17	What is the number of ON-FARM WATER RETENTION STRUCTURES (ponds, retention ditches) constructed by the household ITSELF (using its own resources) to date and existing on land owned by the household. (rentent_hh2)		(Integer)

8.18	What is the number of ON-FARM WATER RETENTION STRUCTURES (ponds, retention ditches) constructed with the HELP OF OTHERS (GOs, NGOs, CBOs) but maintained/protected by the HH to date and existing on land owned by the household. (rentent_othr2)	(Integer)
8.19	What is the length of WATER HARVESTING CANALS constructed by the household ITSELF using its own resources to date and existing on land owned by the household. (canals_hh2)	(Numeric)
8.20	What is the length of WATER HARVESTING CANALS constructed with the HELP OF OTHERS (GOs, NGOs, CBOs) but maintained/protected by the HH) to date and existing on land owned by the household. (canals_othr2)	(Numeric)
8.21	What is the number of HAND-DUG SHALLOW WELLS constructed by the household ITSELF (using its own resources) to date and existing on land owned by the household. (wells_hh2)	(Integer)
8.22	What is the number of HAND-DUG SHALLOW WELLS constructed by the HELP OF OTHERS (GOs, NGOs, CBOs) but maintained/protected by the HH to date and existing on land owned by the household. (wells_othr2)	(Integer)

9.2 Investments in Tree Crops

Enumerator: this next set of questions refers to the number of fruit, non-fruit, and indigenous trees planted on parcels owned by your household. I will be asking you about seedlings planted in the LAST 2 YEARS (the time period from Yekatit 2005 to Tir 2007 in the Ethiopian Calendar) – i.e. the source of any seedlings, number of surviving seedlings, and the general placement of those seedlings – in addition to the total number of trees on that parcel.

Parcel	FRUIT TREES						
	During the LAST TWO YEARS (24 MONTHS):					What is the TOTAL number of FRUIT trees on this parcel?	
	Indicate the NUMBER of seedlings of all types of FRUIT trees planted on each parcel that were:			Number of FRUIT trees surviving (i.e., NINE months plus) <i>Skip if (ftrl2rh + ftrl2bh + ftrl2of) = 0</i>	Where on the parcel were most of these FRUIT trees planted? <i>Skip if (ftrl2rh + ftrl2bh + ftrl2of) = 0</i> <i>2 = In crop lands (agro-forestry) 3 = Boundaries of crop lands</i>		
	raised by the household itself	Bought by the household.	Obtained free of charge from others (GOs, NGOs, CBOs).				
	9.07a	9.07b	9.07c	9.08	9.09	9.10	
	ftrl2rh	ftrl2bh	ftrl2of	ftrl2sur	ftrl2w	frt	
1							
2							
3							
4							
5							

[illegible]

10. Animals, Animal Products, Production and Sales

Enumerator: Please tell us the number of animals that you hold (by type), number of animals you sold and bought, as well as the amount of animal products that you produced and sold (by type) during the PAST YEAR (i.e. the period from Yekatit 2006 to Tir 2007 in the Ethiopian Calendar.)

10.1 Livestock and beekeeping production and sales in the past year

	Type of animal	Number currently owned	Number sold during the year <i>if '0' skip to (lsnpur)</i>	Amount of income during the year from the sale of [lsname] <i>(Birr)</i>	Number bought during the year <i>if '0' skip to (lsncons)</i>	Total amount spent during the year <i>(Birr)</i>	Number of slaughtered for home consumption during the year.
	10.1	10.2	10.3	10.4	10.5	10.6	10.7
	lsname	lsnown	lsnsold	lssoldb	lsnpur	lspurb	lsncons
1001	Oxen						
1002	Cows						
1003	Heifers						
1004	Bulls						
1005	Calves						
1006	Sheep						
1007	Goats						
1008	Chicken						
1009	Equines						
1100	Beehives, traditional						
1111	Beehives, modern						

10.2 Production and sales of animal products in the past year

	Type of animal product	Total production during the last year *		Sales during the last year		
		Quantity If none, record 0, and skip to next item.	Unit	Number of units sold	Unit	Price per unit <i>(Birr)</i>
	10.2001	10.2002	10.2003	10.2004	10.2005	10.2006
	prodname	prodpq	prodpu	prodsq	prodsu	pprodsu
2001	Milk					
2002	Butter					
2003	Cheese					
2004	Egg					
2005	Meat					
2006	Honey					
2007	Hides and skin					
2008	Wool					

Unit codes (prodpu, prodsu)

- 1 = Cm
- 2 = Meter
- 3 = Number
- 4 = Pair
- 5 = Box
- 6 = Cup
- 7 = Liter
- 8 = Roll
- 9 = Pack
- 10 = Cubic Centimeter
- 11 = Meter Square
- 12 = Tuba
- 13 = Araba
- 21 = Gram
- 22 = Kilogram (kg)
- 23 = Quintal (=100kg)

11. Production, Stocks, Purchase, Gifts, and Sales of Food and Cash Crops

Please tell us the TYPE of FOOD and CASH crops you produced on your farm and the amount produced as well as sold during last year (i.e. the period from Yekatit 2006 to Tir 2007 in the Ethiopian Calendar.)

11.1 Cereal production and use

Crop	Cereal Name	Did your household produce, use, or have any [Cereal name]? <i>Yes=1 No=0 If 'No' skip to next crop</i>	Amount on hand at the start of Yekatit 2006		How much was produced? (enter '0' if none)		Amount sold and value (enter '0' if none)			Amount given to others** (enter '0' if none)		Amount received from others ** (enter '0' if none)		Amount purchased? (enter '0' if none)		
			Quant.	Units	Quant.	Units	Quant.	Unit	Total income	Quant.	Units	Quant.	Unit	Quant.	Unit	Total cost
						(see codes)			(Birr)		(see codes)		(see codes)		(see codes)	(Birr)
	11.1	11.2	11.3	11.3b	11.4	11.4b	11.5	11.5b	11.6	11.7	11.7b	11.8	11.8b	11.9	11.9b	11.10
	cropname	cropuse	crhanq	crhanu	crophq	crophu	cropsq	cropsu	cropsu	croppgq	croppgu	cropprq	croppru	croppq	croppu	croppb
1	Teff															
2	Maize															
3	Wheat															
4	Barley															
5	Sorghum															
6	Millet (Zenga da)															
7	Oats															
8	Dagussa															
9	Rice															
10	Sinar/Gerima															
11	Others (specify)															

** Given/received from others include: Food aid, credit/loan, gift, gift to church, etc.

Unit codes (crophu, cropsu, croppgu, croppru, croppu)			
1 = Cm	6 = Cup	10 = Cubic	21 = Gram
2 = Meter	7 = Liter	Centimeter	22 = Kilogram (kg)
3 = Number	8 = Roll	11 = Meter Square	23 = Quintal
4 = Pair	9 = Pack	12 = Tuba	(=100kg)
5 = Box		13 = Araba	

11.2 Pulses production and use

Crop	Crop name	Did you produce OR use (i.e., purchase, receive from others, consume) [crop name]? <i>Yes=1 No=0 If 'No' skip to next crop</i>	Amount on hand at the start of Yekatit 2006		How much was produced? (enter '0' if none)		Amount sold and value (enter '0' if none)			Amount given to others (enter '0' if none)		Amount received from others ** (enter '0' if none)		Amount purchased? (enter '0' if none)		
			Quant.	Units	Quant.	Units	Quant.	Unit	Total income	Quant.	Units	Quant.	Unit	Quant.	Unit	Total cost
	11.1	11.2	11.3	11.3b	11.4	11.4b	11.5	11.5b	11.6	11.7	11.7b	11.8	11.8b	11.9	11.9b	11.10
	cropname	cropuse	crhanq	crhanu	crophq	crophu	cropsq	cropsu	cropsu	croppq	croppu	croprq	cropru	croppq	croppu	croppb
21	Bean (Baqela)															
22	Lentils (Mesir)															
23	Chick Pea (Shimbira)															
24	Field Pea (Ater)															
25	Cow Pea (Akuri Ater)															
26	Haricot Beans (Boloke)															
27	Vetch (Guaya)															
28	Adenguare															
29	Fenugreek (Abish)															
210	Others (specify)															

** Given/received from others include: Food aid, credit/loan, gift, gift to church, etc.

Unit codes (crophu, cropsu, croppu, cropru, croppu)	
1 = Cm	10 = Cubic Centimeter
2 = Meter	11 = Meter Square
3 = Number	12 = Tuba
4 = Pair	13 = Araba
5 = Box	
6 = Cup	21 = Gram
7 = Liter	22 = Kilogram (kg)
8 = Roll	23 = Quintal (=100kg)
9 = Pack	

11.3 Oil crop production and use

Crop	Crop name	Did you produce OR use [crop name]? <i>Yes=1 No=0 If 'No' skip to next crop</i>	Amount on hand at the start of Yekatit 2006		How much was produced? (enter '0' if none)		Amount sold and value (enter '0' if none)			Amount given to others (enter '0' if none)		Amount received from others ** (enter '0' if none)		Amount purchased? (enter '0' if none)		
			11.1	11.2	11.3	11.3b	11.4	11.4b	11.5	11.5b	11.6	11.7	11.7b	11.8	11.8b	11.9
	cropname	cropuse	crhanq	crhanu	crophq	crophu	cropsq	cropsu	cropsu	croppgq	croppgu	cropprq	croppru	cropppq	cropppu	cropppb
31	Flax (Telba)															
32	Groundnuts (Lowz)															
33	Sesame (Selit)															
34	Sunflower (Suf)															
35	Nueg															
310	Others (specify)															

** Given/received from others include: Food aid, credit/loan, gift, gift to church, etc.

Unit codes (crophu, cropsu, croppgu, croppru, cropppu)	
1 = Cm	10 = Cubic Centimeter
2 = Meter	11 = Meter Square
3 = Number	12 = Tuba
4 = Pair	13 = Araba
5 = Box	
6 = Cup	21 = Gram
7 = Liter	22 = Kilogram (kg)
8 = Roll	23 = Quintal (=100kg)
9 = Pack	

11.4 Tubers and Roots production and use

Crop	Crop name	Did you produce OR use [crop name]? <i>Yes=1 No=0 If 'No' skip to next crop</i>	Amount on hand at the start of Yekatit 2006		How much was produced? (enter '0' if none)		Amount sold and value (enter '0' if none)			Amount given to others (enter '0' if none)		Amount received from others ** (enter '0' if none)		Amount purchased? (enter '0' if none)		
			Quant	Unit	Quant.	Units (see codes)	Quant.	Unit	Total income (Birr)	Quant.	Units (see codes)	Quant.	Unit (see codes)	Quant.	Unit (see codes)	Total cost (Birr)
	11.1	11.2	11.3	11.3b	11.4	11.4b	11.5	11.5b	11.6	11.7	11.7b	11.8	11.8b	11.9	11.9b	11.10
	cropname	cropuse	crhanq	crhanu	crophq	crophu	cropsq	cropsu	cropsu	croppq	croppu	croprq	cropru	croppq	croppu	croppb
41	Enset (Kocho)															
42	Potato															
43	Sweet Potato (Sekuar Dinich)															
44	Yam															
45	Godere															
410	Others (specify)															

*** Given/received from others include: Food aid, credit/loan, gift, gift to church, etc.

Unit codes (crophu, cropsu, croppu, cropru, croppu)	
1 = Cm	10 = Cubic Centimeter
2 = Meter	11 = Meter Square
3 = Number	12 = Tuba
4 = Pair	13 = Araba
5 = Box	
6 = Cup	21 = Gram
7 = Liter	22 = Kilogram (kg)
8 = Roll	23 = Quintal (=100kg)
9 = Pack	

11.5 Vegetable production and use

Crop	Crop name	Did you produce OR use [crop name]? <i>Yes=1 No=0 If 'No' skip to next crop</i>	Amount on hand at the start of Yekatit 2006		How much was produced? (enter '0' if none)		Amount sold and value (enter '0' if none)			Amount given to others (enter '0' if none)		Amount received from others ** (enter '0' if none)		Amount purchased? (enter '0' if none)		
			Quant	Unit	Quant.	Units (see codes)	Quant.	Unit	Total income (Birr)	Quant.	Units (see codes)	Quant.	Unit (see codes)	Quant.	Unit (see codes)	Total cost (Birr)
	11.1	11.2	11.3	11.3b	11.4	11.4b	11.5	11.5b	11.6	11.7	11.7b	11.8	11.8b	11.9	11.9b	11.10
	cropname	cropuse	crhanq	crhanu	crophq	crophu	cropsq	cropsu	cropsu	croprq	cropru	croppq	croppu	croppq	croppu	croppb
51	Onion (Shinkurt)															
52	Garlic (Nech Shinkurt)															
53	Tomato															
54	Lettuce (Selaxa)															
55	Fosolia															
56	Cabbage															
57	Tikl Gommen															
58	Beet Root															
59	Carrot															
510	Others															

** Given/received from others include: Food aid, credit/loan, gift, gift to church, etc.

Unit codes (crophu, cropsu, cropgu, cropru, croppu)	
1 = Cm	10 = Cubic Centimeter
2 = Meter	11 = Meter Square
3 = Number	12 = Tuba
4 = Pair	13 = Araba
5 = Box	
6 = Cup	21 = Gram
7 = Liter	22 = Kilogram (kg)
8 = Roll	23 = Quintal (=100kg)
9 = Pack	

11.6 Fruit production and use

Crop	Crop name	Did you produce OR use [crop name]? <i>Yes=1 No=0 If 'No' skip to next crop</i>	Amount on hand at the start of Yekatit 2006		How much was produced? (enter '0' if none)		Amount sold and value (enter '0' if none)			Amount given to others (enter '0' if none)		Amount received from others ** (enter '0' if none)		Amount purchased? (enter '0' if none)		
			Quant	Unit	Quant.	Units (see codes)	Quant.	Unit	Total income (Birr)	Quant.	Units (see codes)	Quant.	Unit (see codes)	Quant.	Unit (see codes)	Total cost (Birr)
	11.1	11.2	11.3	11.3b	11.4	11.4b	11.5	11.5b	11.6	11.7	11.7b	11.8	11.8b	11.9	11.9b	11.10
	cropname	cropuse	crhanq	crhanu	crophq	crophu	cropsq	cropsu	cropsu	cropsu	croppq	croppu	croppu	croppq	croppu	croppu
71	Banana															
72	Orange															
73	Lemon															
74	Papaya															
75	Mango															
76	Apple															
77	Avocado															
78	Guava															
79	Gishta															
710	Others (specify)															

** Given/received from others include: Food aid, credit/loan, gift, gift to church, etc.

Unit codes (crophu, cropsu, croppu, croppu, croppu)	
1 = Cm	10 = Cubic Centimeter
2 = Meter	11 = Meter Square
3 = Number	12 = Tuba
4 = Pair	13 = Araba
5 = Box	
6 = Cup	21 = Gram
7 = Liter	22 = Kilogram (kg)
8 = Roll	23 = Quintal (=100kg)
9 = Pack	

11.7 Cash crop production and use

Crop	Crop name	Did you produce OR use [crop name]? <i>Yes=1 No=0 If 'No' skip to next crop</i>	Amount on hand at the start of Yekatit 2006		How much was produced? (enter '0' if none)		Amount sold and value (enter '0' if none)			Amount given to others (enter '0' if none)		Amount received from others ** (enter '0' if none)		Amount purchased? (enter '0' if none)		
			Quant	Unit	Quant.	Units (see codes)	Quant.	Unit	Total income (Birr)	Quant.	Units (see codes)	Quant.	Unit (see codes)	Quant.	Unit (see codes)	Total cost (Birr)
	11.1	11.2	11.3	11.3b	11.4	11.4b	11.5	11.5b	11.6	11.7	11.7b	11.8	11.8b	11.9	11.9b	11.10
	cropname	cropuse	Crhanq	crhanu	crophq	crophu	cropsq	cropsu	cropsu	cropsq	cropsu	cropsq	cropsu	cropsq	cropsu	cropsq
91	Coffee															
92	Chat/Kat															
93	Pepper															
94	Sugarcane															
95	Cotton															
96	Hopes (Gheshe)															
97	Ginger															
910	Others (specify)															

** Given/received from others include: Food aid, credit/loan, gift, gift to church, etc.

Unit codes (crophu, cropsu, cropgu, cropru, croppu)	
1 = Cm	10 = Cubic Centimeter
2 = Meter	11 = Meter Square
3 = Number	12 = Tuba
4 = Pair	13 = Araba
5 = Box	
6 = Cup	21 = Gram
7 = Liter	22 = Kilogram (kg)
8 = Roll	23 = Quintal (=100kg)
9 = Pack	

12. Farm Inputs

Enumerator: I'm going to ask you some questions about the inputs you applied in THE LAST crop year (from Yekatit 2006 to Tir 2007) on land that you OWN or rented-IN during the last crop year. I will be asking input use for up to three (3) crops by parcel. Note, for each parcel list the three most important crops in terms of livelihood benefit.

12.1 Crop 1

Owned Parcel	Is this parcel fully rented out to others; Yes=1 No=0	Crop (see codes)	Quantity produced of crop (in kg)	Did you use sow/ plant IMPROVED seeds/seedlings for this crop? Yes=1 No=0	Crop 1							
					Amount of chemical fertilizer (DAP PLUS Urea) applied to this crop		Amount of organic fertilizer (manure PLUS compost) applied to this crop		Amount of POWDER crop protection chemicals (Pesticides PLUS herbicides) applied to this crop		Amount of LIQUID crop protection chemicals (Pesticides PLUS herbicides) applied to this crop	
					Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit
	12.01	12.02	12.03	12.04	12.05a	12.05b	12.06a	12.06b	12.07a	12.07b	12.08a	12.08b
	filter_12a	picropid_cra	picropkg_cra	impseed_cra	cfertq_cra	cfertu_cra	ofertq_cra	ofertu_cra	pchemq_cra	pchemu_cra	lchemq_cra	lchemu_cra
1												
2												
3												
4												
5												
		12.3.1r	12.3.2r	12.3.3r	12.3.4ar	12.3.4br	12.3.5ar	12.3.5br	12.3.6ar	12.3.6br	12.3.7ar	12.3.7br
Rented-IN Parcel		picropid_ri_cr1	picropkg_ri_cr1	impseed_ri_cr1	cfertq_ri_cr1	cfertu_ri_cr1	ofertq_ri_cr1	ofertu_ri_cr1	pchemq_ri_cr1	pchemu_ri_cr1	lchemq_ri_cr1	lchemu_ri_cr1
101												
102												
103												

Traction power codes (till_type)

Hand tool/hoe = 1
Own oxen = 2
Rented/shared oxen = 3
Rented tractor = 4

Combine 1 and 2 = 5
Combine 1 and 4 = 6
Combine 3, and 4 = 7
Exchange of labour with oxen=8

12.1 Crop 1 (continued)

	Crop 1			
Owned Parcel	What traction power did your use for this crop? See Codes	Amount of CREDIT taken for farming purposes on this parcel for this crop during the past crop year (in Birr)	What is the SOURCE of credit taken? <i>See codes</i>	Amount of credit repaid during the past crop year, namely from [fcredit_srce] (in Birr)
	12.09	12.10	12.11	12.12
	till_type_cra	fcredit_amt_cra	fcredit_srce_cra	fcredit_paid_cra
1				
2				
3				
4				
5				
	12.3.8r	12.3.9r	12.3.10r	12.3.11r
Rented-IN Parcel	till_type_ri_cr1	fcredit_amt_ri_cr1	fcredit_srce_ri_cr1	fcredit_paid_ri_cr1
101				
102				
103				

Source of credit codes (**fcredit_srce**)

<i>Government=1</i>	<i>Saving and Credit Association=5</i>
<i>NGOs=2</i>	<i>Agricultural input supplier or dealer= 6</i>
<i>Private money lenders=3</i>	<i>Others (specify)=97</i>
<i>Relatives/friends=4</i>	

12.2 Crop 2

Owned Parcel	Crop 2										
	Crop (see codes)	Quantity produced of crop (in kg)	Did you use sow/ plant IMPROVED seeds/seedlings for this crop? Yes=1 No=0	Amount of chemical fertilizer (DAP PLUS Urea) applied to this crop		Amount of organic fertilizer (manure PLUS compost) applied to this crop		Amount of POWDER crop protection chemicals (Pesticides PLUS herbicides) applied to this crop		Amount of LIQUID crop protection chemicals (Pesticides PLUS herbicides) applied to this crop	
				Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit
	12.02	12.03	12.04	12.05a	12.05b	12.06a	12.06b	12.07a	12.07b	12.08a	12.08b
	picropid_crb	picropkg_crb	impseed_crb	cfertq_crb	cfertu_crb	ofertq_crb	ofertu_crb	pchemq_crb	pchemu_crb	lchemq_crb	lchemu_crb
1											
2											
3											
4											
5											
	12.3.1r	12.3.2r	12.3.3r	12.3.4ar	12.3.4br	12.3.5ar	12.3.5br	12.3.6ar	12.3.6br	12.3.7ar	12.3.7br
Rented-IN Parcel	picropid_ri_cr2	picropkg_ri_cr2	impseed_ri_cr2	cfertq_ri_cr2	cfertu_ri_cr2	ofertq_ri_cr2	ofertu_ri_cr2	pchemq_ri_cr2	pchemu_ri_cr2	lchemq_ri_cr2	lchemu_ri_cr2
101											
102											
103											

Traction power codes (**till_type**)

Hand tool/hoe = 1
Own oxen = 2
Rented/shared oxen = 3
Rented tractor = 4

Combine 1 and 2 = 5
Combine 1 and 4 = 6
Combine 3, and 4 = 7
Exchange of labour with oxen=8

12.2 Crop 2 (continued)

	Crop 2			
Owned Parcel	What traction power did your use for this crop? See Codes	Amount of CREDIT taken for farming purposes on this parcel for this crop during the past crop year (in Birr)	What is the SOURCE of credit taken? <i>See codes</i>	Amount of credit repaid during the past crop year, namely from [fcredit_srce] (in Birr)
	12.09	12.10	12.11	12.12
	till_type_crb	fcredit_amt_crb	fcredit_srce_crb	fcredit_paid_crb
1				
2				
3				
4				
5				
	12.2.8r	12.2.9r	12.2.10r	12.2.11r
Rented-IN Parcel	till_type_ri_cr2	fcredit_amt_ri_cr2	fcredit_srce_ri_cr2b	fcredit_paid_ri_cr2
101				
102				
103				

Source of credit codes (fcredit_srce)

<i>Government=1</i>	<i>Saving and Credit Association=5</i>
<i>NGOs=2</i>	<i>Agricultural input supplier or dealer= 6</i>
<i>Private money lenders=3</i>	<i>Others (specify)=97</i>
<i>Relatives/friends=4</i>	

[illegible]

12.3 Crop 3 (continued)

	Crop 3			
Owned Parcel	What traction power did your use for this crop?	Amount of CREDIT taken for farming purposes on this parcel for this crop during the past crop year (in Birr)	What is the SOURCE of credit taken? <i>See codes</i>	Amount of credit repaid during the past crop year, namely from [fcredit_srce] (in Birr)
	See Codes			
	12.09	12.10	12.11	12.12
	till_type_crc	fcredit_amt_crc	fcredit_srce_crc	fcredit_paid_crc
1				
2				
3				
4				
5				
	12.3.8r	12.3.9r	12.3.10r	12.3.11r
Rented-IN Parcel	till_type_ri_cr3	fcredit_amt_ri_cr3	fcredit_srce_ri_cr3	fcredit_paid_ri_cr3
101				
102				
103				

Unit codes		
1 = Cm	7 = Liter	12 = Tuba
2 = Meter	8 = Roll	13 = Araba 21 = Gram
3 = Number	9 = Pack	22 = Kilogram (kg)
4 = Pair	10 = Cubic Centimeter	23 = Quintal (=100kg)
5 = Box	11 = Meter Square	
6 = Cup		

Crop codes			
CEREALS 1= Teff 2=Maize 3=Wheat 4=Barley 5=Sorghum 6=Millet 7=Oats 8=Dagussa 9=Rice 10=Sinar/Gerima 110=Other (specify)	PULSES 21=Bean (Baqela) 22=Lentils (Mesir) 23=Chick Pea (Shimbra) 24=Field Pea (Ater) 25= Cow Pea (Akuri Ater) 26=Haricot Beans (Boloke) 27=Vetch (Guaya) 28=Adenguare 29=Fenugreek (Abish) 120= Other (specify)	TUBERS AND ROOTS 41=Enset (Kocho) 42=Potato 43=Sweet Potato (Sekuar) 44=Yam 45=Godere 410=Other (specify)	FRUITS 71=Banana 72=Orange 73=Lemon 74=Papaya 75=Mango 76= Apple 77=Avocado 78= Guava 79=Gishta 170=Others (specify)
	OIL CROPS 31=Flax (Telba) 32=Groundnuts (Lowz) 33=Sesame (Selit) 34=Sunflower (Suf) 35=Nueg 130=Other(specify)	VEGETABLES 51=Onion (Shinkurt) 52=Garlic (Nech Shinkurt) 53=Tomato 54=Lettuce (Selaxa) 55=Fosolia 56=Cabbage 57=Tikl Gommen 58= Beet Root 59= Carrot 150=Other(specify)	OTHER CASH CROPS 91=Coffee 92=Chat/Kat 93=Pepper 94=Sugarcane 95=Cotton 96=Hopes (Gheshe) 97=Ginger 910=Others (specify)

13. Purchased Food and Non-food Consumption Items

Please tell us the amount of non-farm food and non-food consumption items that you have PURCHASED or received through aid/gift (by type). For a typical month please indicate the approximate MONTHLY purchases and receipts/gifts (non-paid) for the following.

Item	Item purchased OR received	Average monthly purchases			Average monthly receipts or gift (not paid for)	
		Quantity	Unit (see codes)	Expenditure (Birr)	Quantity	Unit (see codes)
	13.01	13.02	13.03	13.04	13.05	13.06
	Prodname1	Prodpq	Prodpu	prodpb	prodrq	prodru
3001	Bread					
3002	Pasta (spaghetti)					
3003	Bottle of Coke or other soda					
3004	Beer (bottle of)					
3005	Tej					
3011	Fish					
3012	Oil					
3013	Sugar					
3014	Salt					
3015	Spices					
3016	Tea					
3017	Coffee					
3018	Gas (household fuel)					
3019	Firewood					
3020	Hand soap					
30020	Others, (specify)					

Unit codes (prodpu, prodru)	
3 = Number	10 = Cubic Centimeter
4 = Pair	11 = Meter Square
5 = Box	12 = Tuba
6 = Cup	13 = Araba
7 = Liter	21 = Gram
8 = Roll	22 = Kilogram (kg)
9 = Pack	23 = Quintal (=100kg)

13.11	What is the approximate MONTHLY household expenditure on food purchases (includes processed foods) in Birr? (foodexp)	(Numeric)
13.12	What is the approximate YEARLY household expenditure for non-food items (i.e., hair care and hygiene, clothing, shoes, utensils, medication, etc) in Birr? (nonfoodexp2)	(Numeric)
13.13	What is the total amount in BIRR of household expenditure for regular festivals/holidays, and traditional/cultural events during the past YEAR? (holidayexp2)	(Numeric)

14. Ownership of Modern Possessions as Indicators of Wealth

Enumerator: Please ask if the household possess the item in the list below and add to the list if any.

14.01	Iron-Roofed House (ironroof2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.02	Television Set (tv2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.03	Mobile Phone (mobile2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.04	Tape Recorder (taperec2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.05	Radio Receiver (radio2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.06	Set of Sofa (sofa2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.07	Spring/Sponge-mattresses bed (mattress2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.08	Metal/Plastic Water Barrel (barrel2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.09	Horse/donkey cart (cart2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.10	Bicycle (bicycle2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.11	Motor Bicycle (motorbike2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.12	Steel plow(plow2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.13	Tractor (tractor2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.14	Water pump (hand/ motorized) (pump2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.15	Modern Beehives (beehive2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.16	Jewellery (Silver, Gold, etc) (jewelry2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.17	Kiosk (kiosk2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.18	A house in town (townhouse2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.19	Improved dairy cows (improv_cow2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.20	Fattening enterprise (fat_entprz2)	<i>Yes=1</i>	<i>No=0</i>	(Code)
14.21	Modern milk churning equipment (milkchurn2)	<i>Yes=1</i>	<i>No=0</i>	(Code)

15. Permanent and Seasonal Migration

Enumerator: In this series of questions I will ask you about members of your household who have PERMANENTLY or TEMPORARILY left home in the LAST 2 YEARS (i.e. the time period from Yekatit 2005 to Tir 2007 in the Ethiopian Calendar).

15.01	Has at least one member of your household left home for good (PERMANENTLY) during the LAST 2 YEARS (24 MONTHS)? (perm_migrat2) <div style="float: right; text-align: right;"> <i>Yes=1</i> <i>No=0</i> <i>if 'No' skip to (temp_leave)</i> </div>	(Code)
15.02	If the answer is YES, how many members of your household left home for Good (PERMANENTLY) during the LAST 2 YEARS (24 MONTHS)? (no_migrat2)	(Integer)
15.03a-d	Why did these members of the household leave? When listing the reason, start with the household member who left first, followed by the next, etc. ending with the reason for the member who left most recently. <div style="text-align: center;"> <i>Reason for leaving codes:</i> <i>Schooling=1</i> <i>Looking for job=2</i> <i>To assist relatives= 3</i> <i>Sick/for medication=4</i> <i>Marriage =5</i> <i>Divorce = 6</i> <i>Shortage of land = 7</i> <i>Others(specify)=97</i> </div>	
	Household member 1 (whymiga2)	(Code)
	Household member 2 (whymigb2)	(Code)
	Household member 3 (whymigc2)	(Code)
	Household member 4 (whymigd)	(Code)

15.04	Has at least 1 member of your household ever left home TEMPORARILY (for more than 3 days and nights) in search of work during the LAST 2 YEARS (24 MONTHS)? (temp_leave2)	<i>Yes=1</i> <i>No=0</i> <i>if 'No' skip to 15.08</i>	(Code)
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Enumerator: Please list which household members TEMPORARILY left home in search of work in the LAST 2 YEARS (i.e. the time period from Yekatit 2005 to Tir 2007 in the Ethiopian Calendar)

[illegible]

15.08	<p>Participation in past baseline survey (parbase):</p> <p>for households who participated in ELTAP survey: “In year 2000 of the Ethiopian Calendar (December 2007) your household was selected as part of a household survey. Did you personally take part in that survey?”</p> <p>for households who participated in ELAP survey: “In year 2004 of the Ethiopian Calendar (May 2012) your household was selected as part of a household survey. Did you personally take part in that survey?”</p>	<p><i>Yes = 1</i> <i>No = 0</i> <i>Don't know = 888</i></p>	(Code)
15.09	How much money or money equivalent income did the household earn from all economic activities (both primary and secondary) during the past one year, namely, from Yekatit 2006 to Tir 2007, in Birr? (econinca)		(Numeric)

16. Follow-up contact information

Would you mind being contacted for any follow-up questions?

16.01	Would you mind being contacted for any follow-up questions? (followup)	<i>Yes=1</i> <i>No=0</i>	(Code)
16.02	Do you have a mobile phone number? (mob_own1)	<i>Yes=1</i> <i>No=0</i> <i>if 'No' skip to (mob_cont2)</i>	(Code)
16.03	If yes, is it ok if we contact you via this number? (mob_cont1)	<i>Yes=1</i> <i>No=0</i> <i>if 'No' ->END</i>	(Code)
16.04	If yes, what is the number? (PII)		(Integer)
16.05	Is there a second number from someone from the HH that we could use to contact you? (mob_cont2)	<i>Yes=1</i> <i>No=0</i> <i>if 'No' ->END</i>	(Code)
16.06	If yes, what is the number? (PII)		(Integer)

Codes

Livestock codes (lsid)	Animal products and other food and non-food consumption items (prodid)	
<i>1001 = Oxen</i> <i>1002 = Cows</i> <i>1003 = Heifers</i> <i>1004 = Bulls</i> <i>1005 = Calves</i> <i>1006 = Sheep</i> <i>1007 = Goats</i> <i>1008 = Chicken</i> <i>1009 = Equines</i> <i>1100 = Beehives, traditional</i> <i>1111 = Beehives, modern</i>	ANIMAL PRODUCTS <i>2001 = Milk</i> <i>2002 = Butter</i> <i>2003 = Cheese</i> <i>2004 = Egg</i> <i>2005 = Meat</i> <i>2006 = Honey</i> <i>2007 = Hides and skin</i> <i>2008 = Wool</i> <i>20010 = Other (specify)</i>	PURCHASED FOOD AND NON-FOOD CONSUMPTION ITEMS <i>3001 = Bread</i> <i>3002 = Pasta (spaghetti)</i> <i>3003 = Can of Coke (regular)</i> <i>3011 = Fish</i> <i>3012 = Oil</i> <i>3013 = Sugar</i> <i>3014 = Salt</i> <i>3015 = Spices</i> <i>3016 = Tea</i> <i>3017 = Coffee</i> <i>3018 = Gas (household fuel)</i> <i>3019 = Firewood</i> <i>3020 = Hand soap</i> <i>30020 = Others, (specify)</i>

EIFTRI and Cloudburst Consulting Group
Ethiopia Land Tenure Administration Program (ELTAP) and
Ethiopia Strengthening Land Administration Program (ELAP)
Endline WIFE(S) Survey (ELAPIE14)

S2-1	Questionnaire ID Number (HH ID) (hh_id)	(Integer)
S2-2	Enumerator ID (enumerator_ID)	(Numeric)
S2-3	Region (killil) <i>Tigray = 1 Amhara = 2</i> <i>Oromia = 3 SNNP = 4</i>	(Code)
S2-4	Zone (zone)	(Dynamic)
S2-5	Woreda (woreda)	(Dynamic)
S2-8	Kebele (name of selected kebele) (PII)	(Dynamic)
S2-9	Name of the village (gox) (PII)	(Dynamic)

Informed Consent

Hi, my name is _____. I am a researcher working with the Ethiopian Inclusive Finance Training and Research Institute (EIFTRI), the U.S. Agency for International Development, Cloudburst Group, and Clark University on a study of looking at the impact of land use rights recognition in Ethiopia. Your participation is entirely voluntary. If you agree to participate, our discussion will last for approximately 30 minutes. Please be assured that your answers will remain completely confidential. We will not provide your name and answers to anyone outside of the research team. Do not feel obligated to answer any question that you are not comfortable with and do not hesitate to ask me for a clarification if you think that a question is a bit difficult or unclear. You may stop participating at any time. Your responses will be summed together with those of roughly 4500 other households in Ethiopia and general averages from analysis will be reported. If you have questions about this survey, you may contact the Research Manager in Addis Ababa, Ethiopia, Dr. Wolday Amaha. His contact information is 0911+21+4005. This study has been approved by the Clark Committee for the Rights of Human Participants in Research and Training Programs (IRB). Any questions about human rights issues should be directed to the IRB Chair, Dr. James P. Elliott +1 (508) 793\7152. This research is not affiliated with the Government of Ethiopia and will not be used for tax purposes. We would be very thankful for your participation.

S2-6.	Do you consent to participate in this survey? (w1_consent)	<i>Yes=1</i> <i>No=2 -> STOP</i>	(Code)
S2-6	Do you consent to participate in this survey? (w2_consent)	<i>Yes=1</i> <i>No=0 -> STOP</i>	(Code)

Roster wives respondents

Enumerator: record the name and following information for each woman married to the household head.

Resp. ID	Name <i>Make a complete list of all the wives taking part in the wives questionnaire.</i>	How old are you? <i>Number of years</i>	For how many years have you been married? <i>Number of years</i>	What is the highest level of education you have received? <i>Illiterate=1 Read only=2 Read & write=3 Grade 4 complete =4 Grade 8 complete = 5 Grade 10-12 complete = 6 Above grade 12= 7</i>
wifeid	P11	A.2	A.3	A.4
1	(w1_wifenm)	(w1_wifeage)	(w1_wifenyrmr)	(w1_wifeedu)
2	(w2_wifenm)	(w2_wifeage)	(w2_wifenyrmr)	(w2_wifeedu)

Enumerator: Please ask the FIRST wife the following questions (if the household is POLYGAMOUS, i.e. more than one wife exists in a household, you also ask next the second wife).

Enumerator Note: in this questionnaire “during the last 24 months” refers to the time period from Yekatit 2005 to Tir 2007 in the Ethiopian Calendar and ‘during last year’ refers to the period from Yekatit 2006 to Tir 2007 in the Ethiopian Calendar.

Wife #1

SECTION 1: Land holdings within the household

Enumerator: Now I would like to ask you about each plot of land you possess, either only in your name or with other people in your household

1.2	1.3	1.4	1.5	1.6	1.7
Do you possess parcel [parcelid]? No = 0 Yes =1 If 'No' Skip to next parcel.	Does [parcelid] have any type of land certificate? No = 0 Yes =1 If 'No' Skip to next parcel.	What type of certification has been issued for [parcelid]?* First level=1 Second level=2 Both first level and second level = 3 I don't know=888	To whom was the certificate for [parcelid] issued? Certificate issued jointly with spouse (husband) =1 The certificate is issued in my name only=2 Certificate issued to the household = 3 certificate issued to husband only = 4 I do not know =888	What names are on the certificate for [parcelid]? Both spouses' names =1 Only the name of both spouses stated on the certificate = 2 Certificate issued to the household and spouse name included only in the name list of the household= 3 I do not know = 888	Whose photos are associated with the certificate for [parcelid]? Both spouse photos are on the certificate = 1 Only my photo is on the certificate = 2 Only my husband's photo is on the certificate = 3 No photo = 4 Husband photo on 1st level, no photo on second = 5 Wife photo on 1st level, no photo on second = 6 Other family member = 7 I do not know = 888 Not applicable = -997
parcw1own	parcw1cer	parcw1t	parcw1sit	parcw1name	parcw1pic

Enumerator: Ensure the parcel ID's and the text description for each parcel matches the household roster for land possession.

*Enumerator: use photo or digital image to show examples of: i) 1st level certificate/book of holding; and ii) 2nd level certificate/book of holding.

SECTION 2

Enumerator: Now, I am going to ask you some questions about how land is dealt with in different family situations

2.0	In this kebele, in the event of divorce, how is land shared between the husband and spouse? (w1_lldiv2) Enumerator: Probe and code, select appropriate answer choice.	Both spouses share the land equally despite who contributed land to the marriage =1 The husband retains all the land under the HH possession =2 Each spouse takes only the plot they contributed to the marriage = 3 The wife will retain all the plots under the HH possession = 4 I do not know/have no experience about it = 5	(Code)
2.1	In this kebele, in the event of the death of a husband, how is land divided among family members? (w1lddeathh2) Enumerator: Probe and code, select appropriate answer choice.	The wife and children will inherit the land =1 The wife will inherit all the land =2 All the children will share the land equally =3 Only male children inherit the land = 4 The relatives (not wife or children) of the diseased inherit the land = 5 Others (specify)=7 I do not know =6	(Code)
2.2	In this kebele, do women bring dowry to marriage? (w1dowry2) {NOTE: provide enumerators with appropriate definitions} If 2 or 3 skip to (w1dow)	Yes=1 No=0 In the past yes, but not now=3 I don't know = 4	(Code)
2.3	If yes do they bring the following as a forms of dowry to the marriage?	Land= w1dowryta Cash= w1dowrytb Animal (ox, cow, goats or sheep)= w1dowrytc Other (specify)= w1dowrytd Household Goods= w1dowryte Crops = w1dowrytf	(Code)
2.4	Did you bring a dowry to your marriage? (w1dow)	Yes=1 No=0	
2.5	Did you bring the following as a form of dowry to your marriage?	Land= w1dowtt Cash= w1dowtt_b Animal (ox, cow, goats or sheep)= w1dowtt_c Other (specify)= w1dowtt_d	(Code)

Now, I would like to ask you some questions about land certification and women.

2.6	Did you know about the process of land registration and title certification that took place in your kebele? (w1klcert2)	Yes = 1 No= 0 I have no idea about this = 3	(Code)
2.7	If yes, when did the process of land registration and title	year in EC	(Numeric)

	certification take place in your kebele? (w1_wiklcertyr)		
2.8	Did you participate in the kebele meetings that discussed the process of land certification in your kebele? (w1lcertm2)	<i>Yes=1 No= 0 I have no idea about this = 3</i>	(Code)
2.9	If yes, when did you participate in the kebele meetings that discussed the process of land certification in your kebele? (w1lcertmyr)	<i>year in EC</i>	(Numeric)
2.10	Have you ever been elected and served in the kebele land administration committee? (w1elect2)	<i>Yes = 1 No= 0 I have no idea about this = 3 if '2' or '3' skip to w1survpres</i>	(Code)
2.11	If yes, when were you elected to serve on the kebele land administration committee? (w1electyr)	<i>year in EC</i>	(Numeric)
2.12	Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? (w1survpres2)	<i>Yes, I was present and consulted = 1 Yes, I was present but not consulted = 2 No, I was not there= 3 Land not measured yet = 4 if 4, skip to next segment</i>	(Code)
2.13	When did the surveyors come to measure your (also household's) land? (w1survpresyr)	<i>year in EC</i>	(Numeric)

SECTION 3: Land-related disagreements

Enumerator: Now I am going to ask you about disagreements related to land.

Type ID	Type of disagreement	How common are [distypnm] for women in your kebele? Very common= 1 Somewhat common= 2 Not common=3 I don't know =4
distypid		
1	Conflicting land claim following divorce (w1_distypnma2)	(w1_disttypcoma2)
2	Conflicting land claim following inheritance (w1_distypnmb2)	(w1_disttypcomb2)
3	Boundary encroachment (w1_distypnmc2)	(w1_disttypcomc2)
4	Share-cropping and rental matters (w1_distypnmd2)	(w1_disttypcomd2)
5	Others (specify) (w1_distypnme2)	(w1_disttypcome2)

3.6	If a woman has a disagreement over her land, where can she go for help resolving this disagreement? <i>Enumerator: Probe and code, select all that apply.</i>	Arbitration by elders=1 (w1_disphelpa2) Yes=1 No=0	(Check box)
		Social court=2 (w1_disphelpb2) Yes=1 No=0	(Check box)
		Kebele/ woreda administration=3 (w1_disphelpc2) Yes=1 No=0	(Check box)
		Arbitration by relatives and parents of spouses=4 (w1_disphelpd2) Yes=1 No=0	(Check box)
		Women affairs organizations=5 (w1_disphelpf2) Yes=1 No=0	(Check box)
		Other, please specify=6 (w1_disphelpf) Yes=1 No=0	(Check box)
		(Text)	
3.7	Have you been involved in any kind of land disagreement in the past two years? (w1_displ2y2)	Yes=1 No=0	(Code)

3.8	Did you lose land as a result of any land-related disagreements in the past two years (24 MONTHS)? (w1_displ2ylose2)	Yes=1 No=0	(Code)
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Enumerator: Now I would like to ask you about any land disagreements on land OWNED by your household that you were involved in over the past two years (24 MONTHS).

During the last two years (24 MONTHS), were you involved in any land related disagreements on {parcel ID}?	What type of land related disagreement ? <i>(probe and code, see codes)</i>	How serious was the disagreement? <i>(code)</i>	Was it resolved? Yes =1 No = 2 If No, skip to w1dispref	How was this dispute finally resolved? Ask if w1dispres=1 <i>(code)</i>	How long did it take to resolve the dispute? (in months) Ask if w1dispres=1	Where was the dispute referred to? Ask if w1dispres=2 <i>(code)</i>	For how long has this dispute been under deliberation? (in months) Ask if w1dispres=2
w1disp	w1distyp	w1disps	w1dispres	w1dispresm	w1dispt	w1dispref	w1dispd

Type of disagreement codes (w1distyp)	Degree of seriousness codes (w1disps)	Disagreement resolution method codes (w1dispresm, w1dispref)
1= Yegebagnal, i.e., conflicting land claims by non-family members 2= Yegebagnal, i.e., conflicting land claims following divorce 3= Yegebagnal, i.e., conflicting land claims related to inheritance 4= Boundary / encroachment matters 5= Conflict that arise from exchange of parcels of land 6= Conflict that arise in relation to access to road 7= Conflict that arise in relation to water (flood) transfer 8= Sharecropping and rental matters 9= Others (specify)	1= Very serious 2= Serious 3= Somewhat serious 4= Not serious	1= Formal court 2= Shimagele, i.e., Elders council 3= Family's, relatives' or kin-group's internal mechanism 4= kebele/woreda administration 5= Others (specify)

SECTION 4: Perceptions related to land and land certificates.

Enumerator: Finally, I would like to ask you about your opinions on issues related to land and land certificates.

4.1	If you have land in your name and you have/or will get certificate of possession for it, do you think that the certificate will encourage you more to rent -OUT your plot of land? (w1_rentcert2)	<i>Yes=1</i> <i>No=0</i> <i>I have no land in my name=3</i> <i>I do not know about the future=4</i>	(Code)
4.2	If you have land in your name and you have/or will get certificate of possession for it, would/do you feel confident that you will get your land back if you rent it OUT to a relative? (w1_croutfam)	<i>Yes=1</i> <i>No=0</i> <i>I have no land in my name=3</i> <i>I do not know about the future=4</i>	(Code)
4.3	If you have land in your name and you have/or will get certificate of possession for it, would/do you feel confident that you will get your land back if you rent it OUT to a non-relative (i.e. neighbor, someone from another kebele, etc.)? (w1_croutnfam)	<i>Yes=1</i> <i>No=0</i> <i>I have no land in my name=3</i> <i>I do not know about the future=4</i>	(Code)
4.4	Will /has the land certification have any impact on your ability to negotiate whether or not you participate in land rental market (i.e. over the rental rate, length of contract, who land is lent to, etc)? (w1_rentcpart2)	<i>Yes, it will improve my negotiation power=1</i> <i>No impact at all=2</i> <i>I do not know about it wait and see=3</i>	(Code)
4.5	How do you perceive/see the effect of land certification on women? (w1_certperc)		
	<p>Enumerator: Read responses, probe and code selecting all that apply.</p>	<i>It will enhance women's bargaining power within the household (w1_certperca2)</i> <i>Yes=1, No=0</i>	(Code)
		<i>It could bring economic independence to women (w1_certpercc2)</i> <i>Yes=1, No=0</i>	(Code)
		<i>Other perceived effects? (w1_certperce2)</i> <i>Yes=1, No=0</i>	(Code)
		<i>If Yes, specify</i>	(Text)
		<i>I do not know about its effect yet (w1_certpercd2)</i>	(Code)

		<i>Yes=1, No=0</i>	
		<i>It will have no effect on women (w1_certpercb2)</i> <i>Yes=1, No=0</i>	(Code)
4.6	How confident are you that, in the event of your husband's death, you will be able to inherit your husband's land without facing challenges from others? (m2s2_3q6e)	<i>Very confident=1</i> <i>Confident=2</i> <i>Somewhat confident=3</i> <i>Not at all confident=4</i>	
4.7	Do you think there are laws that adequately protect the land rights of women? (w1_llawpw2)	<i>Yes there are=1</i> <i>No there are not=2</i> <i>I do not know about this issue=3</i>	(Code)
4.8	Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? (w1_llawenf2)	<i>Yes there are=1</i> <i>No there are not=2</i> <i>I do not know=3</i>	(Code)

Enumerator: please ask the SECOND wife the following questions if the household is a POLYGAMY one (if more than one wife exists in a household).

Wife #2

SECTION 1: Land holdings within the household

Enumerator: Now I would like to ask you about each plot of land you possess, either only in your name or with other people in your household

1.2	1.3	1.4	1.5	1.6	1.7
Do you possess parcel [parcelid] ? <i>No= 0</i> <i>Yes =1</i> <i>If 'No' Skip to next parcel.</i>	Does [parcelid] have any type of land certificate? <i>No= 0</i> <i>Yes =1</i> <i>If 'No' Skip to next parcel.</i>	What type of certification has been issued for [parcelid] ?* <i>First level=1</i> <i>Second level=2</i> <i>Both first level and second level = 3</i> <i>I don't know = 888</i>	To whom was the certificate for [parcelid] issued? <i>Certificate issued jointly with spouse (husband) =1</i> <i>The certificate is issued in my name only=2</i> <i>Certificate issued to the household = 3</i> <i>certificate issued to husband only = 4</i> <i>I do not know =888</i>	What names are on the certificate for [parcelid] ? <i>Both spouses' names =1</i> <i>Only the name of both spouses stated on the certificate = 2</i> <i>Certificate issued to the household and spouse name included only in the name list of the household= 3</i> <i>I do not know =888</i>	Whose photos are associated with the certificate for [parcelid] ? <i>Both spouse photos are on the certificate = 1</i> <i>Only my photo is on the certificate = 2</i> <i>Only my husband's photo is on the certificate = 3</i> <i>No photo = 4</i> <i>Husband photo on 1st level, no photo on second=5</i> <i>Wife photo on 1st level, no photo on second=5</i> <i>I do not know = 888</i> <i>Not applicable = -997</i>
w2_parcw1own	w2_parcw1cer	w2_parcw1t	w2_parcw1sit	w2_parcw1name	w2_parcw1pic

Enumerator: Ensure the parcel ID's and the text description for each parcel matches the household roster for land possession.

*Enumerator: use photo or digital image to show examples of: i) 1st level certificate/book of holding; and ii) 2nd level certificate/book of holding.

For parcels that are **solely OR jointly** owned by the respondent (i.e. where parcw1own = 1):

[illegible]

SECTION2

Enumerator: Now, I am going to ask you some questions about how land is dealt with in different family situations

2.0	In this kebele, in the event of divorce, how is land shared between the husband and spouse? (w2_ldiv2) Enumerator: Probe and code, select appropriate answer choice.	Both spouses share the land equally despite who contributed land to the marriage =1 The husband retains all the land under the HH possession =2 Each spouse takes only the plot they contributed to the marriage = 3 The wife will retain all the plots under the HH possession = 4 I do not know/have no experience about it = 5	(Code)
2.1	In this kebele, in the event of the death of a husband, how is land divided among family members? (w2lddeathh2) Enumerator: Probe and code, select appropriate answer choice.	The wife and children will inherit the land =1 The wife will inherit all the land =2 All the children will share the land equally =3 Only male children inherit the land = 4 The relatives (not wife or children) of the diseased inherit the land = 5 Others (specify)=7 I do not know =6	(Code)
2.2	In this kebele, do women bring dowry to marriage? (w2dowry2) w2dowryta w2dowrytb w2dowrytc w2dowrytd	Yes=1 No=0 In the past yes, but not now=3 I don't know = 4	(Code)
2.3	If yes do they bring the following as a form of dowry to the marriage?	Land= w2dowryta Cash= w2dowrytb Animal (ox, cow, goats or sheep)= w1dowrytc Other (specify)= w2dowrytd Household Goods= w2dowryte	(Code)
2.4	Did you bring a dowry to your marriage? (w2_w1dow)	Yes=1 No=0 I don't know=3	(Code)
2.5	If yes, Did you bring the following as a form of dowry to your marriage?	Land= w2_w1dowtt Cash= w2_w1dowtt_b Animal (ox, cow, goats or sheep)= w2_w1dowtt_c Other (specify)= w2_w1dowtt_d	(Code)

Now, I would like to ask you some questions about land certification and women.

2.6	Did you know about the process of land registration and title certification that took place in your kebele? (w2klcert2)	Yes = 1 No= 0 I have no idea about this = 3	(Code)
2.7	If yes, when did the process of land registration and title	year in EC	(Numeric)

	certification take place in your kebele? (w2_wiklcertyr)		
2.8	Did you participate in the kebele meetings that discussed the process of land certification in your kebele? (w2lcertm2)	<i>Yes=1 No= 0 I have no idea about this = 3</i>	(Code)
2.9	If yes, when did you participate in the kebele meetings that discussed the process of land certification in your kebele? (w2_w1lcertmyr)	<i>year in EC</i>	(Numeric)
2.10	Have you ever been elected and served in the kebele land administration committee? (w2elect2)	<i>Yes = 1 No= 0 I have no idea about this = 3 if '2' or '3' skip to w1survpres</i>	(Code)
2.11	If yes, when were you elected to serve on the kebele land administration committee? (w2_w1electyr)	<i>year in EC</i>	(Numeric)
2.12	Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? (w2survpres2)	<i>Yes, I was present and consulted = 1 Yes, I was present but not consulted = 2 No, I was not there= 3 Land not measured yet = 4 if 4, skip to next segment</i>	(Code)
2.13	When did the surveyors come to measure your (also household's) land? (w2_w1survpresyr)	<i>year in EC</i>	(Numeric)

SECTION 3: Land-related disagreements

Enumerator: Now I am going to ask you about disagreements related to land.

Type ID	Type of disagreement	How common are [distypnm] for women in your kebele? Very common= 1 Somewhat common= 2 Not common=3 I don't know =4
distypid	distypnm	disttypcom
1	Conflicting land claim following divorce (w2_distypnma2)	(w2_disttypcoma2)
2	Conflicting land claim following inheritance (w2_distypnmb2)	(w2_disttypcomb2)
3	Boundary encroachment (w2_distypnmc2)	(w2_disttypcomc2)
4	Share-cropping and rental matters (w2_distypnmd2)	(w2_disttypcomd2)
5	Others (specify) (w2_distypnme2)	(w2_disttypcome2)

3.6	If a woman has a disagreement over her land, where can she go for help resolving this disagreement? <i>Enumerator: Probe and code, select all that apply.</i>	Arbitration by elders=1 (w2_disphelpa2) Yes=1 No=0	(Check box)
		Social court=2 (w2_disphelpb2) Yes=1 No=0	(Check box)
		Kebele/ woreda administration=3 (w2_disphelpc2) Yes=1 No=0	(Check box)
		Arbitration by relatives and parents of spouses=4 (w2_disphelpd2) Yes=1 No=0	(Check box)
		Women affairs organizations=5 (w2_disphelpf2) Yes=1 No=0	(Check box)
		Other, please specify=6 (w2_disphelpf) Yes=1 No=0	(Check box)
		<div style="border: 1px solid black; padding: 5px;">(Text)</div>	

3.7	Have you been involved in any kind of land disagreement in the past two years? (w2_displ2y2)	Yes=1 No=0	(Code)
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3.8	Did you lose land as a result of any land-related disagreements in the past two years (24 MONTHS)? (w2_displ2ylose2)	Yes=1 No=0	(Code)
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Enumerator: Now I would like to ask you about any land disagreements on land OWNED by your household that you were involved in over the past two years (24 MONTHS).

During the last two years (24 MONTHS), were you involved in any land related disagreements on {parcel ID}?	What type of land related disagreement ? <i>(probe and code, see codes)</i>	How serious was the disagreement? <i>(code)</i>	Was it resolved? Yes =1 No = 2 <i>If No, skip to w1dispref</i>	How was this dispute finally resolved? <i>Ask if w1dispres=1</i> <i>(code)</i>	How long did it take to resolve the dispute? (in months) <i>Ask if w1dispres=1</i>	Where was the dispute referred to? <i>Ask if w1dispres=2</i> <i>(code)</i>	For how long has this dispute been under deliberation? (in months) <i>Ask if w1dispres=2</i>
w2_disp	w2_distyp	w2_disps	w2_dispres	w2_dispresm	w2_dispt	w2_dispref	w2_dispd

Type of disagreement codes (w2_distyp)	Degree of seriousness codes (w2_disps)	Disagreement resolution method codes (w2_dispresm, w2_dispref)
1= Yegebagnal, i.e., conflicting land claims by non-family members 2= Yegebagnal, i.e., conflicting land claims following divorce 3= Yegebagnal, i.e., conflicting land claims related to inheritance 4= Boundary / encroachment matters 5= Conflict that arise from exchange of parcels of land 6= Conflict that arise in relation to access to road 7= Conflict that arise in relation to water (flood) transfer 8= Sharecropping and rental matters 9= Others (specify)	1= Very serious 2= Serious 3= Somewhat serious 4= Not serious	1= Formal court 2= Shimagele, i.e., Elders council 3= Family's, relatives' or kin-group's internal mechanism 4= kebele/woreda administration 5= Others (specify)

SECTION 4: Perceptions related to land and land certificates.

Enumerator: Finally, I would like to ask you about your opinions on issues related to land and land certificates.

4.1	If you have land in your name and you have/or will get certificate of possession for it, do you think that the certificate will encourage you more to rent -OUT your plot of land? (w2_rentcert2)	<i>Yes=1</i> <i>No=0</i> <i>I have no land in my name=3</i> <i>I do not know about the future=4</i>	(Code)
4.2	If you have land in your name and you have/or will get certificate of possession for it, would/do you feel confident that you will get your land back if you rent it OUT to a relative? (w2_croufam)	<i>Yes=1</i> <i>No=0</i> <i>I have no land in my name=3</i> <i>I do not know about the future=4</i>	(Code)
4.3	If you have land in your name and you have/or will get certificate of possession for it, would/do you feel confident that you will get your land back if you rent it OUT to a non-relative (i.e. neighbor, someone from another kebele, etc.)? (w2_croutnfam)	<i>Yes=1</i> <i>No=0</i> <i>I have no land in my name=3</i> <i>I do not know about the future=4</i>	(Code)
4.4	Will /has the land certification have any impact on your ability to negotiate whether or not you participate in land rental market (i.e. over the rental rate, length of contract, who land is lent to, etc)? (w2_rentcpart2)	<i>Yes, it will improve my negotiation power=1</i> <i>No impact at all=2</i> <i>I do not know about it wait and see=3</i>	(Code)
4.5	How do you perceive/see the effect of land certification on women? (w2_certperc)		
	Enumerator: Read responses, probe and code selecting all that apply.	<i>It will enhance women's bargaining power within the household (w2_certperca2)</i> <i>Yes=1, No=0</i>	(Code)
		<i>It could bring economic independence to women (w2_certpercc2)</i> <i>Yes=1, No=0</i>	(Code)
		<i>Other perceived effects? (w2_certperce2)</i> <i>Yes=1, No=0</i>	(Code)
		<i>If Yes, specify</i>	(Text)
		<i>I do not know about its effect yet (w1_certpercd2)</i> <i>Yes=1, No=0</i>	(Code)
		<i>It will have no effect on women (w2_certpercb2)</i> <i>Yes=1, No=0</i>	(Code)
4.6	How confident are you that, in the event of your husband's death, you will be able to inherit your husband's land without facing challenges from others? (w2_m2s2_3q6e)	<i>Very confident=1</i> <i>Confident=2</i> <i>Somewhat confident=3</i> <i>Not at all confident=4</i>	
4.7	Do you think there are laws that adequately protect the land rights of women? (w2_llawpw2)	<i>Yes there are=1</i> <i>No there are not=2</i> <i>I do not know about this issue=3</i>	(Code)

4.8	Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? (w2_llawenf2)	<i>Yes there are=1</i> <i>No there are not=2</i> <i>I do not know=3</i>	(Code)
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**Ethiopia Land Tenure Administration Program (ELTAP) and
Ethiopia Strengthening Land Administration Program (ELAP)
Endline Community Survey (ELAPIE14)**

SECTION A:

A1.	Unique Kebele ID (kebeleID)	(Numeric)
A2.	Enumerator ID (enumerator_ID)	(Numeric)
A3.	Zone (czone)	(Dynamic)
A4.	Region (ckillil) <i>Tigray = 1 Amhara = 2</i> <i>Oromia = 3 SNNP = 4</i>	(Code)
A7.	Woreda (cworeda) PII	(Dynamic)
A8.	Kebele (name of selected kebele) PII	(Dynamic)
A9.	Name of the village (gox) PII	(Dynamic)
A10.	Location coordinates: Latitude PII	(numeric)
A11.	Location coordinates: Longitude PII	(numeric)

Informed Consent

Hi, my name is _____. I am a researcher working with Ethiopian Inclusive Finance Training and Research Institute (EIFTRI), the U.S. Agency for International Development, Cloudburst Group, and Clark University on a study of looking at the impact of second level land certification in Ethiopia. I would like to ask you some questions to better understand your village. Your participation is entirely voluntary. If you agree to participate, our discussion will last for around 60 minutes. Please be assured that your answers will remain completely confidential. We will not provide your name and answers to anyone outside of the research team. Do not feel obligated to answer any question that you are not comfortable with and do not hesitate to ask me for a clarification if you think that a question is a bit difficult or unclear. You may stop participating at any time. Your responses will be summed together with those of roughly 300 other key informants in Ethiopia and general averages from analysis will be reported. If you have questions about this survey, you may contact the Research Manager in Addis Ababa, Ethiopia, Dr. Wolday Amaha His contact information is 0911+21+4005. This study has been approved by the Clark Committee for the Rights of Human Participants in Research and Training Programs (IRB). Any questions about human rights issues should be directed to the IRB Chair, Dr. James P. Elliott (508) 793\7152. We would be very thankful for your participation.

A12	Do you consent to participate in this survey? (consent) <i>variable dropped after removing non-consenting</i>	<i>Yes=1</i> <i>No=0 -> STOP</i>	(Code)
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SECTION B: ROSTER OF RESPONDENTS

ID	Respondent Name Allow 2 to 3 respondents. <i>Make a complete list of individuals serving as key informants for the completion of this questionnaire.</i>	Gender <i>1 = male 2 = female 3 = prefer not to respond</i>	How old are you? <i>number of years</i>	What position do you currently hold in this kebele? Allow 2 to 3 respondents. <i>1 = Chairman/woman 2 = Representative (Women, Youth, Etc.) 3 = Elder 4 = School Headmaster 5 = School Teacher 6 = Agricultural Extension Development Officer 7 = Health Worker 8 = Business Man/Woman 9 = Religious Leader 10 = Police 11 = Kebele manager 12 = Other (Specify) 13 = Vice Chair person 14 = Land Administration Committee 15 = Security Officer 16 = Head of Organization 17 = Representative of Saving and Credit 18 = Former Chairperson 19 = Spokesperson 20 = Community Facilitator 21 = Secretary 22 = Head of finance</i>		What is the highest level of education you have received? <i>1 = Never Attended 2 = Some Primary 3 = Complete Primary 4 = Some Secondary 5 = Complete Secondary 6 = Religious school 7 = IVET (Technical training) 8 = Adult education 9 = Diploma 10 = Degree 11 = Masters</i>	For how many years have you lived in this kebele? <i>number of years</i>
id	(PII)	crsex	crage	crpos1	crpos2	credu	cryrcom
B1	B2	B3	B4	B5	B6	B7	B8
1	PII	crsex1	crag1	crpos11	crpos21	credu1	cryrcom1
2	PII	crsex2	crag2	crpos12	crpos22	credu2	cryrcom2
3	PII	crsex3	crag3	crpos13	crpos23	credu3	cryrcom3

SECTION C: BASIC INFORMATION AND ACCESSIBILITY

Enumerator: I would like to start by asking you some basic information about your kebele.

C1	In the last five years, have there been more people who moved into the kebele or more people who moved away from the kebele? (cmig)	<i>1=More moved in</i> <i>2=More moved out</i> <i>3=About the same of both</i> <i>4=Neither arrivals nor departures</i>	(Code)
C2	Approximately how many households are there in this kebele? (cnhh)		(Integer)
C3	What is the approximate population of this kebele? (cpop)		(Integer)
C4	What percentage of the households in this kebele are polygamous? (cpolyg)	<i>1 = 0%</i> <i>2 = 1-24%</i> <i>3 = 25-49%</i> <i>4 = 50-74%</i> <i>5 = 75-99%</i> <i>6 = 100%</i>	(Code)
C5	What is the most common use of land in this kebele? (cluse)	<i>1=Pasture</i> <i>2=Farming</i> <i>3=Planned Housing</i>	(Code)
C6	What is the topography of the land most like? (ctopo)	<i>1=Flat</i> <i>2=Slightly sloping</i> <i>3=Moderately sloping</i> <i>4=Steeply sloping</i> <i>5=Both flat and hilly</i>	(Code)
C7	What percentage of the land in your kebele is in bush (i.e., land that is not farmed, or was farmed years ago, but is now used only for pasture)? (cbushl)	<i>1= 0%</i> <i>2= 1-24%</i> <i>3= 25-49%</i> <i>4=50-74%</i> <i>5=75-99%</i> <i>6=100%</i>	(Numeric)
C8	What percentage of the agricultural land in your kebele is in large scale farms? (cagl)	<i>1=0%</i> <i>2=1-24%</i> <i>3=25-49%</i> <i>4=50-74%</i> <i>5=75-99%</i> <i>6=100%</i>	(Code)
C9	What percentage of the land in your kebele is in forest, and not used for agriculture? (cforl)	<i>1=0%</i> <i>2=1-24%</i> <i>3=25-49%</i> <i>4=50-74%</i> <i>5=75-99%</i> <i>6=100%</i>	(Code)

C10	Have there been any major events in the past 5 years that have NEGATIVELY affected the wellbeing of people in this kebele ? (Examples: crop failure, price fluctuations, etc.) (cmajore)		1=Yes 2=No If 'No' skip to cmajore1		(Code)																																			
Event id	Which of the following events have occurred in the past 5 years NEGATIVELY affecting the kebele? (*Choose up to four major events that have had NEGATIVE effect on members of the kebele. Codes may be duplicated if the event type occurred more than once.)		In what season and year did the event occur?		What percentage of households in the kebele were affected? 1=0% 2=1-24% 3=25-49% 4=50-74% 5=75-99% 6=100%																																			
	<p style="text-align: center;">Event Code</p> <table border="0"> <tr> <td>1=Drought</td> <td>8=Loss of key social services</td> <td>16=Improved transportation services</td> <td>25=Plant destruction</td> </tr> <tr> <td>2=Flood</td> <td>9=Massive job lay-offs</td> <td>17=Improved electricity</td> <td>26=Crop damage by animals</td> </tr> <tr> <td>3=Crop disease/pests</td> <td>10=Power outage(s)</td> <td>18=PSNP</td> <td>27=Taxation</td> </tr> <tr> <td>4=Livestock disease</td> <td>11=Development projects</td> <td>19=Frost</td> <td>28=Town expansion</td> </tr> <tr> <td>5=Human epidemic disease</td> <td>12=New employment opportunity</td> <td>20=Hailstorm</td> <td>29=Poor mobile phone service</td> </tr> <tr> <td>6=Displacement-related development activities</td> <td>13=New health facility</td> <td>21=Early Rain</td> <td></td> </tr> <tr> <td>7=Sharp change in prices</td> <td>14=New road</td> <td>22=Heavy/too much rain</td> <td></td> </tr> <tr> <td></td> <td>15=New school</td> <td>23=Factory chemicals</td> <td></td> </tr> <tr> <td></td> <td></td> <td>24=Shortage of clean water</td> <td></td> </tr> </table>		1=Drought	8=Loss of key social services		16=Improved transportation services	25=Plant destruction	2=Flood	9=Massive job lay-offs	17=Improved electricity	26=Crop damage by animals	3=Crop disease/pests	10=Power outage(s)	18=PSNP	27=Taxation	4=Livestock disease	11=Development projects	19=Frost	28=Town expansion	5=Human epidemic disease	12=New employment opportunity	20=Hailstorm	29=Poor mobile phone service	6=Displacement-related development activities	13=New health facility	21=Early Rain		7=Sharp change in prices	14=New road	22=Heavy/too much rain			15=New school	23=Factory chemicals				24=Shortage of clean water		Season (See codes below)
1=Drought	8=Loss of key social services	16=Improved transportation services	25=Plant destruction																																					
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C11 Cmewid	C12 Cmewcode		C14 Cmewsc	C15 Cmewyr	C16 Cmewper																																			
1	cmewcode_1		cmewsc_1	cmewyr_1	cmewper_1																																			
2	cmewcode_2		cmewsc_2	cmewyr_2	cmewper_2																																			
3	cmewcode_3		cmewsc_3	cmewyr_3	cmewper_3																																			
4	cmewcode_4		cmewsc_4	cmewyr_4	cmewper_4																																			

Season codes (cmewsc, cmebsc)

1=Kiremt or Meher (Summer) - June, July and August are the summer season. Heavy rain falls in these three months.

2=Tseday (Spring) - September, October and November are the spring season sometime known as the harvest season.

3=Bega (Winter) - December, January and February are the dry season with frost in morning especially in January.

4=Belg (Autumn) - March, April and May are the autumn season with occasional showers. May is the hottest month in Ethiopia. 5=All

C17	Have there been any major events in the past 5 years that have POSITIVELY affected the wellbeing of people in this kebele? (Examples: new schools or medical facilities, price fluctuations, etc.) (cmajore1)	1=Yes 2=No If 'No' skip to cmajore1		(Code)																																											
	Which of the following events have occurred in the past 5 years POSITVLY affecting the kebele? (*Choose up to four major events that have had a POSITVE effect on members of the kebele. Codes may be duplicated if the event type occurred more than once.)	In what season and year did the event occur?		What percentage of households in the kebele were affected?																																											
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1=Drought	10=Power outage(s)	21=Early rain	32=Improved clean/																																												
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3	cmewcodep_3	cmewscp_3	cmewyrp_3	cmewperp_3																																											
4	cmewcodep_4	cmewscp_4	cmewyrp_4	cmewperp_4																																											

SECTION D: ACCESS TO BASIC SERVICES

D1	How far is it to the nearest tar/asphalt road in KILOMETERS from the kebele center? Write '0' if there is a tar/asphalt road in the kebele. <i>If not sure enter -99. (cdistpr)</i>	(Numeric)
D2	Can vehicles pass on the main road in this kebele throughout the whole year (i.e. even in the rainy season)? (crstype) <i>If Yes, Skip to question D.5</i>	<div> <div><i>1=Yes</i></div> <div><i>0=No</i></div> </div> <div>(Code)</div>
D3	During the past 12 months, how many months was the main road NOT passable with small cars and trucks? If passable in all months enter '0'. (crpmcar)	(Numeric)
D4	During the past 12 months, how many months was the main road NOT passable by a lorry? If passable in all months enter '0'. (crpmlor)	(Numeric)
D5	How far is it to the nearest bus station in KILOMETERS from the kebele center? (write '0' if there is a bus station in the kebele)? (cbsdist)	(Numeric)
D6	Typically, how many times per WEEK can you expect a bus or mini-bus to stop in this kebele, or at the nearest bus station? (ctpwbus)	(Numeric)
D7	What is the total cost in BIRR to go from this kebele to the woreda capital via public transportation? (cptcwor)	(Numeric)
D8	What is the nearest major urban center – zonal or regional capital? (PII)	(Text)
D9	How far is it via roads to the nearest major urban center in KILOMETERS from the kebele center? (cnurbdist)	(Numeric)
D10	What is the total cost in BIRR to go from this kebele to that major urban center via public transportation? (ccosturb)	(Numeric)
D11	Is there a large weekly market in this kebele? (cwmark) <i>1=Yes</i> <i>2=No</i> <i>If 'Yes' skip to (ccell)</i>	<div>(Code)</div>
D12	What is the distance via road in KILOMETERS to the nearest large weekly market from the kebele center? (cwmdist)	(Numeric)
D13	Is there cellular/mobile phone coverage in this kebele? (ccell) <i>1=Yes</i> <i>2=No</i>	<div>(Code)</div>
D14	What is the distance via road IN KILOMETERS from the kebele center to the nearest place where a person can buy a cell phone? Enter '0' if there is a place in this kebele that sells cellular/mobile phones. (ccelldist)	(Numeric)
D15	Is there a place in this kebele where a person can pay to make a telephone call? (e.g., a payphone, a phone bureau, a tele-center offering phone services)? (cphone) <i>0=No</i> <i>1=Yes</i> <i>2=Not sure</i> <i>if 'No' skip to (cnchurch)</i>	<div>(Code)</div>
D16	What is the WALKING distance IN KILOMETERS from the kebele center to the nearest place where a person can pay to use a phone? <i>If not sure enter 888. (cphonedist)</i>	(Numeric)
D17	How many churches (congregations) are in this kebele? (cnchurch)	(Numeric)
D18	How many mosques are in this kebele? (cnmosq)	(Numeric)
D19	What is the WALKING distance IN KILOMETERS from the kebele center to the nearest	(Numeric)

	government primary school serving this kebele? <i>If not sure enter 888. (cgpsdist)</i>	
D20	What is the WALKING distance IN KILOMETERS from the kebele center to the nearest government secondary school serving this kebele? <i>If not sure enter 888. (cgssdist)</i>	(Numeric)
D21	Is there a commercial bank in this kebele? (cbank) <i>1=Yes</i> <i>0=No</i> <i>if 'Yes' skip to (cmic)</i>	(Code)
D22	What is the distance IN KILOMETERS from the kebele center to the nearest commercial bank? <i>If not sure enter -99. (cbankdist)</i>	(Numeric)
D23	Is there a micro-finance institution in this kebele? (cmic) <i>1=Yes</i> <i>0=No</i> <i>if 'Yes' skip to SECTION E</i>	(Code)
D24	What is the distance via roads in KILOMETERS from the kebele center to the nearest micro-finance institution? <i>If not sure enter 888. (cmicdist)</i>	(Numeric)

SECTION E: ECONOMIC ACTIVITIES

Activity id	What are the three most important sources of employment for individuals in this kebele?	Approximately, what percentage of the households in this kebele are engaged in this activity? <i>1=0%</i> <i>2=1-24%</i> <i>3=25-49%</i> <i>4=50-74%</i> <i>5=75-99%</i> <i>6=100%</i>
	Activity code (see below)	
Cempid	Cemp	Cempphh
E1	E2	E4
1	cemp_1	cempphh_1
2	cemp_2	cempphh_2
3	cemp_3	cempphh_3

Employment Activity code (cemp, countemp1, countemp2)	
1=Farming	7=Transport
2=Fishing	8=Large-scale commercial industry
3=Firewood/charcoal selling	9=Professional occupations
4=Small-scale trade & service provision	10=Civil service
5=Beer brewing, kachasu	11= Sand and stone sales
6=Handicraft production, small-scale industry	12=Gold mining
	13=PSNP
	14=Construction
	15=Day labor/maid/casual worker

Enumerator: Now I am going to ask you some questions on temporary out-migration.

E5	Do people in this kebele leave temporarily during certain times of the year to look for work elsewhere? (coutemp)	<i>1=Yes</i> <i>0=No</i> <i>If 'No' skip to (cinemp)</i>	(Code)
E6	What percentage of the households in the kebele have members who leave temporarily to look for work elsewhere?(Enter code for percentage between 0-100) (coutempp)	<i>1=0%</i> <i>2=1-24%</i> <i>3=25-49%</i> <i>4=50-74%</i> <i>5=75-99%</i> <i>6=100%</i>	(Code)
E7	Where do most of them go? (coutempw)	<i>1=Rural areas</i> <i>2=Urban centers</i> <i>3=Outside Ethiopia</i>	(Code)
What are the two most common types of work that these individuals seek? See employment activity codes:			
E8 Most common (coutemp1)		(Code)	
E9 Second most common (coutemp2)		(Code)	

Enumerator: Now I am going to ask you some questions on temporary in-migration.

E10	Do people come to this kebele during certain times of the year to look for work? (cinemp)	<i>1=Yes</i> <i>0=No</i> <i>If 'No' skip to SECTION F</i>	(Code)
E11	Where do most of them come from? (cinempw)	<i>1=Rural areas</i> <i>2=Urban centers</i> <i>3=Outside Ethiopia</i>	(Code)
What are the two most common types of work that these individuals seek?			
E12 Most common (cinemp1)		(Code)	
E13 Second most common (cinemp2)		(Code)	

SECTION F: AGRICULTURAL ACTIVITIES

ENUMERATOR: NOW, I AM GOING TO ASK YOU ABOUT THE MAJOR AGRICULTURAL CROPS IN THIS KEBELE.

What three crops have the largest PLANTED AREA in your kebele?		
Crop area rank ID	Name of Crop <i>Refer to crop codes below</i>	Approximately, what percentage of cultivated land was planted to this crop in the past season? 1=0% 2=1-24% 3=25-49% 4=50-74% 5=75-99% 6=100%
F1	F2	F3
cmareaid	cmcropaid	cmcropaper
cmareaid_1	cmcropaid_1	cmcropaper_1
cmareaid_2	cmcropaid_2	cmcropaper_2
cmareaid_3	cmcropaid_3	cmcropaper_3
What are the three main crops grown and sold to end users OUTSIDE this kebele?		
Crop value rank ID	Name of Crop	Approximately, what percentage of farm income is derived from the sale of this crop to persons outside the kebele? 1=0% 2=1-24% 3=25-49% 4=50-74% 5=75-99% 6=100%
F4	F5	F6
cmvalid	cmcropvid	cmcropvper
cmvalid_1	cmcropvid_1	cmcropvper_1
cmvalid_2	cmcropvid_2	cmcropvper_2
cmvalid_3	cmcropvid_3	cmcropvper_3

Enumerator: Now, I am going to ask you some questions about the timing of the rains and input use in this kebele.

F7	For growing major crops in the last season, the rains began ...? (Refer to the last meher season) (crains)	1=Too soon 2=At the right time 3=Too late 4= Not sure	(Code)
F8	For growing major crops in the last season, the rains ended...? (Refer to the last meher season) (craine)	1=Too soon 2=At the right time 3=Too late 4= Not sure	(Code)
F9	Is there an irrigation scheme in this kebele? (cirr)	1=Yes 0=No if 'No' skip to (cfertsr)	(Code)
F10	How many farmers from the kebele are part of this irrigation scheme? (cirrnf)	(Numeric)	
F11	Who is the major source of fertilizer in this kebele? (cfertsr)	1=Government 2=Private	(Code)

		3=Union 4=Cooperative	
F12	Who is the major source of pesticides/herbicides in this kebele? (cphebsrc)	1=Government 2=Private 3=Union 4=Cooperative	(Code)
F13	Who is the major source of hybrid seeds in this kebele? (chybsrc)	1=Government 2=Private 3=Union 4=Cooperative	(Code)

SECTION G: LAND ADMINISTRATION

NOTE: include definitions/details and pictures to discern between first and second level

First level: first stage book of holding/certificate, green/blue books, photos, no surveying

Second level: second stage book of holding/certificate, detailed mapping/surveying of parcels

Enumerator: Now I am going to ask you some questions about land and land administration in your kebele.

G1	In what year did the last OFFICIAL land redistribution take place in this kebele? (Ethiopian calendar year) (colredyr)		(Numeric)
	<i>Enumerator: the last OFFICIAL land redistribution should have taken no later than year 1989 in EC</i>		
G2	Has there been any UNOFFICIAL land redistribution in this kebele since 1989 in EC? (cuolred)	0=No 1=Yes 2=Not sure if 'No' skip to (cconsreq)	(Code)
G3	In what year did the most recent UNOFFICIAL land redistribution take place? (Ethiopian calendar year) (cuolredyr) Enter 888 if Don't know.		(Integer)
G4	Does the woreda administration regulate watershed management in any parts of this kebele? (cconsreq)	0=No 1=Yes 2=Not sure	(Code)
G5	Are any members of your kebele required by the woreda administration to implement water conservation measures on their own property? (propreq)	0=No 1=Yes 2=Not sure	(Code)
G6	Do you think that demarcation of public and kebele land will reduce the problem of encroachment on common property resources? (commench)	0=No 1=Yes 2=Not sure	(Code)
G7	Do you think that demarcation of public and kebele land will increase the possibility of your kebele receiving compensation in case the land is taken? (commcomp)	0=No 1=Yes 2=Not sure	(Code)
G8	Where is the nearest land administration/land registry office located? PII		(text)
G9	How far is the nearest land administration office from this		(numeric)

	kebele in KILOMETERS when using [clofftrmode] as the mode of transportation? Enter '0' if is located in this kebele (cloffdist)		
G10	What mode of transportation is typically used for kebele residents when traveling to the nearest land administration office? (clofftrmode) <i>1= on foot</i> <i>2= bicycle</i> <i>3= motorcycle</i> <i>4=tricycle (bajaj)</i> <i>5= car</i> <i>6= horse or mule</i> <i>7= cart (horse/mule/donkey)</i> <i>8= public transport/bus</i>		(code)
G11	How long does it take to travel to the nearest land administration office ONE WAY when using [clofftrmode] as the mode of transportation? (number of hours) (clofftrtime)		(numeric)
G12	What is the typical cost in BIRR of public transportation for someone to travel from this kebele to the nearest land administration office? (cloffptrcst) <i>Enter 888 if Don't know.</i>		(numeric)
G13	Do residents of this kebele tend to formally record/report to the nearest land administration office when there is a change in land ownership (i.e. divorce, inheritance, etc.)? (cloffchown) <i>0=No</i> <i>1=Yes</i> <i>2=Not sure</i>		(Code)
G14	Do residents of this kebele tend to formally record/report to the nearest land administration office when temporarily permitting someone else to use their land, such as in the case of sharecropping or renting out? (cloffchrent) <i>0=No</i> <i>1=Yes</i> <i>2=Not sure</i>		(Code)
G15	Approximately, what is the fee for registering a PERMANENT change in land ownership at the land administration office in Birr? enter '888' if not known (cloffownfee)		(numeric)
G16	Approximately, what is the fee for registering a TEMPORARY change in land use at the land administration office in Birr? enter '888' if not known (clofftempfee)		(numeric)
G17	Has the farmland in this kebele been covered by any land certification activities? (clcert) <i>0=No</i> <i>1=Yes</i> <i>2=Not sure</i> <i>If 'No' Skip to (cconf)</i>		(Code)
G18	Has FIRST LEVEL land certification taken place in your kebele? (clcertf) <i>ENUMERATOR: Please explain using example of first-level land certificate.</i> <i>0=No</i> <i>1=Yes</i> <i>2=Not sure</i> <i>If 'No' Skip to (clcerts)</i>		(Code)
G19	In what year did activities towards FIRST LEVEL land certification start in this kebele? (Ethiopian calendar year) (clcertfsyr)		(Integer)
G20	In what year were FIRST LEVEL certificates issued in this kebele? (Ethiopian calendar year) (clcertfyr)		(Integer)
G21	Have any SECOND LEVEL land certification activities taken place in your kebele? (clcerts) <i>ENUMERATOR: Please explain using example of second-level land certificate.</i> <i>0=No</i> <i>1=Yes</i> <i>2=Not sure</i> <i>If no Skip to (cconf)</i>		(Code)
G22	When did the SECOND LEVEL land registration and certification program start in		(Integer)

	your kebele? (Ethiopian calendar year) (clcertsst)	
G23	Were public information meetings regarding second level land registration and certification held in the 6 months PRIOR to the program launch? (clcertinfopre) <i>0=No 1=Yes 2=Not sure</i>	(Code)
G24	In what year was the SURVEYING and REGISTRATION for SECOND LEVEL certification conducted? (Ethiopian calendar year) (clcertssyr)	(Numeric)
G25	Were public information meetings regarding second level land registration and certification held in the 6 months AFTER the program launch? (clcertinfopost) <i>0=No 1=Yes 2=Not sure</i>	(Code)
G26	Have second level certificates been issued in this kebele? (clcertsci) <i>0=No 1=Yes 2=Not sure</i> <i>If no Skip to (cconf)</i>	(Code)
G27	In what YEAR were SECOND LEVEL land certificates ISSUED in this kebele? (Ethiopian calendar year) (clcertsciyr)	(Numeric)
G28	Compared to 5 years ago, how has the number of land-related disagreements in your kebele changed? (cconf) <i>1=Increased 2=Decreased 3=Remained the same</i>	(Code)

Section H: Supplemental Questions:

H1	Since the first level land certificates were first issued in this kebele, have there been efforts to systematically UPDATE and VERIFY the information on land holdings (i.e. parcels owned, size of parcels, spatial reference information, etc.) and revise households first level land certification documents? (clcertfrev) <i>0=No 1=Yes 2=Not sure</i>	
H2	In what year did this start? (clcertrevsyr) (year in EC)	
H3	In what year was this completed or expected to be completed? (clcertfrevfyr) (year in EC)	

H4	Within this kebele, Is there an official or office which is responsible for acting as an INTERMEDIARY between households and the woreda land administration office? For example, if a household is updating, revising, or otherwise registering changes related to their land holdings, is there someone in the kebele that would collect the necessary information and documents and who would then take this to the woreda land administration office for formal processing? (clkebloffice) <i>1=Yes 0=No</i>	
----	---	--

SECTION I: PRICE INFORMATION

I1	What is the date of the price data collection? P11	(Numeric)
I2	From what type of location are these items/prices? (cptypeoloc) <i>1=Marketplace</i> <i>2=Shops/stalls</i> <i>3=Agriculture office</i> <i>4=Kebele</i>	(Code)
I3	What is the name of the location from where these items/prices are? P11	(Text)
I4	Location coordinates: Latitude P11	(Numeric)
I5	Location coordinates: Longitude P11	(Numeric)

Enumerators: When collecting price information data should reflect current LOCAL market conditions and actual activity. The respondents should report based on a *typical* transaction and report the amount (i.e. bag, bundle, sack, kilogram, quintal, etc.) and the price per unit.

Item	Unit (see unit code)	Weight, volume, or number of units	Price (Birr)
CEREALS			
I7	I8	I9	I10
itemname	unitid	unitn	itempr
Teff			
Maize			
Wheat			
Barley			
Sorghum			
Millet			
Oats			
Dagussa			
Rice			
Sinar/Gerima			
PULSES			
itemname	unitid	unitn	itempr
Bean (Baqela)			
Lentils (Mesir)			
Chick Pea (Shimbra)			
Field Pea (Ater)			
Cow Pea (Akuri Ater)			
Haricot Beans (Boloke)			
Vetch (Guaya)			
Adenguare			
Fenugreek (Abish)			
OIL CROPS			
itemname	unitid	unitn	itempr

itemname	unitid	unitn	itempr
Flax (Telba)			
Groundnuts (Lowz)			
Sesame (Selit)			
Sunflower (Suf)			
Nueg			
TUBERS AND ROOTS			
itemname	unitid	unitn	itempr
Enset (Kocho)			
Potato			
Sweet Potato (Sekuar Dinich)			
Yam			
Godere			
Others (specify)			
VEGETABLES			
itemname	unitid	unitn	itempr
Onion (Shinkurt)			
Garlic (Nech Shinkurt)			
Tomato			
Lettuce (Selaxa)			
Fosolia			
Cabbage			
Tikl Gomme			
Beet Root			
Carrot			
FRUITS			
itemname	unitid	unitn	itempr
Banana			
Orange			
Lemon			
Papaya			
Mango			
Apple			
Avocado			
Guava			
Gishta			
OTHER CASH CROPS			
itemname	unitid	unitn	itempr
Coffee			
Chat/Kat			
Pepper			
Sugarcane			
Cotton			
Hops (Ghesho)			
Ginger			
Livestock and other			

itemname	unitid	unitn	itempr
Oxen			
Cows			
Heifers			
Bulls			
Calves			
Sheep			
Goats			
Chicken			
Equines			
Beehives, traditional			
Beehives, modern			
ANIMAL PRODUCTS			
itemname	unitid	unitn	itempr
Milk			
Butter			
Cheese			
Egg			
Meat			
Honey			
Hides and skin			
Wool			
Purchased Food and Non-food Consumption Items			
itemname	unitid	unitn	itempr
Bread			
Pasta (spaghetti)			
Can of soda (regular)			
Fish			
Oil			
Sugar			
Salt			
Spices			
Tea			
Coffee			
Gas (household fuel)			
Firewood			
Hand soap			
Others, (specify)			

Unit codes (unitid)		
Area	Weight	Other
1 = Timad	21 = Gram	81 = Number
2 = Qert	22 = Kilogram (kg)	82 = Frequency
3 = Gemed	23 = Quintal (1Qt = 100kg)	83 = Pair
4 = Square meter		84 = Box
5 = Gezm	Length	85 = Visit
6 = Kelad	41 = Centimeter (cm)	86 = Tablet
7 = Keda	42 = Meter	87 = Roll
8 = Goro	43 = Kilometer	88 = Pack
9 = Segnii		89 = Trip
10 = Frechassa	Volume	90 = Ticket
11 = Gibir	61 = Cubic centimeter (cm ³)	91 = Service
12 = Tilm	62 = Spoon	92 = Set
13 = Hectare	63 = Cup	93 = Bundle
	64 = Liter	
	65 = Sack	
	66 = Pail	
	67 = Can/bottle (0.35 liter)	
	68 = Can/bottle (0.5 liter)	

Enumerator: PLEASE answer the following question based on your observation.

111	What type of surface does that main road in this kebele have? (crstype1)	1 = Tar/asphalt 2 = Graded gravel 3 = Dirt road (maintained) 4 = Dirt track	(Code)
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SECTION J. WAGES

Activity ID	Typical daily wage rates by type of agricultural activity for adults and children			
	Name of activity	Daily wage rate (Birr/day)		
		Adult male	Adult female	Children
agactid	agactname	agwagem	agwagef	agwagec
J1	J2	J3	J4	J5
1	Land preparation			
2	Planting			
3	Weeding and maintenance			
4	Harvesting			
5	Livestock herding/watering			

Thank you for taking the time to complete this survey.

**Ethiopia Land Tenure Administration Program (ELTAP) and
Ethiopia Strengthening Land Administration Program (ELAP)
Woreda Land Administration Questionnaire (ELAPIE14)**

Section A: Background

A1.	Enumerator ID (enumerator_ID)	(Integer)	
A2.	Date Western:	(PII)	
A3.	Field Supervisor's Name:	(PII)	
A4.	Woreda ID Number (wor_id)	(Integer)	
A5.	Region (wkillil)	Tigray =1 Amhara =2 Oromia = 3 SNNP = 4	(Code)
A6.	Zone	(PII)	
A7.	Location coordinates: Latitude	(PII)	
A8.	Location coordinates: Longitude	(PII)	

Informed Consent

Hi, my name is _____. I am a researcher working with Ethiopian Inclusive Finance Research and Training Institute (EIFTRI), the U.S. Agency for International Development, Cloudburst Group, and Clark University on a study of looking at the impact of second level land certification in Ethiopia. I would like to ask you some questions to better understand land administration in your woreda. Your participation is entirely voluntary. If you agree to participate, our discussion will last for around 30 minutes. The information supplied here will be associated with the land administration office in this particular woreda. Any personally identifiable information, such as your name, will not be made public and will be kept confidential. If you have questions about this survey, you may contact the Research Manager in Addis Ababa, Ethiopia, Dr. Wolday Amaha. His contact information is 0911+21+4005. This study has been approved by the Clark Committee for the Rights of Human Participants in Research and Training Programs (IRB). Any questions about human rights issues should be directed to the IRB Chair, Dr. James P. Elliott (508) 793\7152.

A9.	Do you consent to participate in this survey? (consent)	Yes=1 No=2 -> STOP	(Code)
A10.	Primary interviewee's full name (PII)		

Section B: Respondent Information

Name	Gender	For how many years have you worked in this office? number of years	What is your position in this office? 1=management 2= administrator 3= clerk 97= Other (Specify)	What is the highest level of education you have received? 1 = Never Attended 2 = Some Primary 3 = Complete Primary 4 = Some Secondary 5 = Complete Secondary Post-secondary education: 61 = Diploma 62 = Degree 63 = Masters or above 97= Other (Specify)
B2.	B3.	B4.	B5.	B6.
<i>Make a list of the individuals working at the land administration office responding to this questionnaire.</i>	<i>1 = male 2=female</i>			
P11	wrsex1	cryrcom1	wrpos1	wredu1
P11	wrsex2	cryrcom2	wrpos2	wredu2
P11	wrsex3	cryrcom3	wrpos3	wredu3

Section C: Land registration and certification

Enumerator: Please record the total out-of-pocket administrative fee associated with the following types of transactions. Here administrative fee includes all those payments made to the land administration office associated with the indicated activity.

Type of activity or service provided by the woreda land administration office	What is the total administrative fee associated with [wlaactnm]? <i>If nothing enter '0', if not applicable enter '-997' and skip to next service (amount in Birr)</i>	On average, how many trips to this office are required in order to complete the requirements associated with [wlaactnm]? <i>(number)</i>	On the average trip, how many hours does a person spend waiting at the office to complete the requirements associated with [wlaactnm]? <i>(number)</i>	In a typical week, approximately how many requests does this land administration office receive associated with [wlaactnm]? <i>(number)</i>
C2.1-9	C3.1-9	C4.1-9	C5.1-9	C6.1-9
wlaactnm	wlaofee	wlaotrip	wlaow	wlonreq
Obtaining a new land certificate (for land which was not previously registered) (wlaactnm1)	wlaofee1	wlaotrip1	wlaow1	wlonreq1
Replacing a lost land certificate (for land which was previously registered) (wlaactnm2)	wlaofee2	wlaotrip2	wlaow2	wlonreq2
Registering land obtained from someone due to DIVORCE settlement (wlaactnm3)	wlaofee3	wlaotrip3	wlaow3	wlonreq3
Registering INHERITED LAND from someone OUTSIDE the household (wlaactnm4)	wlaofee4	wlaotrip4	wlaow4	wlonreq4
Registering INHERITED LAND from someone INSIDE the household (wlaactnm5)	wlaofee5	wlaotrip5	wlaow5	wlonreq5
Registering a GIFT of land (wlaactnm6)	wlaofee6	wlaotrip6	wlaow6	wlonreq6
Sharecropping (wlaactnm7)	wlaofee7	wlaotrip7	wlaow7	wlonreq7
Renting-OUT a parcel on the basis of monetary rent payment (wlaactnm8)	wlaofee8	wlaotrip8	wlaow8	wlonreq8
UNSPECIFIED long term arrangements (lease, mortgage / woled-aghed, etc.) (wlaactnm9)	wlaofee9	wlaotrip9	wlaow9	wlonreq9

Section D: Land certification activities*

*Enumerator: As necessary, use photo or digital image to show examples of: i) 1st level certificate/book of holding; and ii) 2nd level certificate/book of holding.

D1	Has FIRST LEVEL land certification taken place in your woreda? 1=Yes (wlcertf) 0=No If 'No' Skip to (wlcerts)	(Code)
D2	In what year were FIRST LEVEL certificates issued in this woreda? Year in EC (wlcertyr)	(Integer)
D3	How is joint FIRST LEVEL certification between a husband and wife confirmed? (wlcertfwh) 1 = Pictures of both spouses attached 2 = Names and signatures of both entered as certificate holders 3 = Names of both entered as certificate holders 4= Name of wife entered as one of the household members 97 = Other (specify)	(Code)
D4	Since the first level land certificates were originally issued in this woreda, have there been efforts to systematically update and revise household information on land holdings (i.e. parcels owned, size of parcels, spatial reference information, etc.) and record this in their (first level land certification) booklet of land holdings? (wlcertfrev) Enumerator: Enter 'yes' to this question if there has been an effort to systematically update first level land certification documentation for most or all households within one or more kebeles in this woreda. Note that this does not include routine updates that target a small number of households	1=Yes 0=No If 'No' Skip to (wlcerts)
D5	In what year did this start? (wlcertfrevys)	(year in EC)
D6	In what year was this completed or expected to be completed? (wlcertfrevye)	(year in EC)
D7	Are there any SECOND LEVEL land certification activities that have taken place in this woreda? (wlcerts) Enumerator note: All woredas should have some kebeles which have had second level land certification activity to date. However, the second level certification process may not have been completed (i.e. issuance of second level certificates to land owners) in some or all kebeles where the process was initiated.)	1=Yes 0=No If 'No' then STOP (Code)
D8	How is joint SECOND LEVEL certification between a husband and wife confirmed? (wlcertswh) 1 = Pictures of both spouses attached 2 = Names and signatures of both entered as certificate holders 3 = Names of both entered as certificate holders 4= Name of wife entered as one of the household members 5 = Other (specify)	(Code)

Enumerator: The roster below refers to ONLY those kebeles in this woreda where some second level land certification activities have occurred. List all kebeles in this woreda where at least some second level land certification activities have taken place.

Kebele ID (numeric)	In what year did SURVEYING parcels in this kebele start? (year in EC)	What program was this associated with?*	Issuance of second level certificates.	
			Were second level certificates issued to households in this kebele? Yes =1 No = 0	If yes, in what year were these issued. (year in EC)
D10	D11	D12	D13	D14
w2lknm1-23	w2lksuryr1-23	w2lkprog1-23	w2lkcert1-23	w2klcertyr1-23

* Ethiopia Land Tenure Administration Program (ELTAP) and Ethiopia Land Administration Program (ELAP) supported by USAID.

Thank you for taking the time to complete this survey. Your input is extremely important and we very much appreciate your assistance.

ANNEX V—DISCLOSURE OF CONFLICTS OF INTEREST

This impact evaluation and all subsequent work did not yield any conflicts of interest. However, it is important to note that the *baselines* were collected under a subcontract to the implementer and therefore do not represent third-party, independent design and data collection efforts. The *endline* data collection and analysis conducted by ERC are in compliance with USAID Evaluation Policy requirements for an independent and external impact evaluation.

ANNEX VI—BASELINE REPORTS

Annex 6 consists of two baseline reports. The first, for ELTAP, is titled “Establishment of a Qualitative and Quantitative Base Line to Assess Land Tenure Security Perceptions and to Establish Starting Points for Measuring Socio Economic Impacts of the ELTAP Land Certification Program – Phase I” and starts on page 236. The second baseline report, ELAP, is titled “A Final Baseline Survey Report on Ethiopia: Strengthening Land Administration Program (ELAP)” and starts on page 282.

**Establishment of a Qualitative and Quantitative Base Line to Assess
Land Tenure Security Perceptions and to Establish Starting Points
for Measuring Socio Economic Impacts of the ELTAP Land
Certification Program – Phase I**

Report Prepared for

Ethiopia–Strengthening Land Tenure and Administration Program
(ELTAP), ARD Inc. Addis Ababa.

By

Ethiopian Economics Association / Ethiopian Policy Research
Institute, Addis Ababa.

June 2008

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Acknowledgment

Ethiopian Economics Association / Ethiopian Policy Research Institute and its Research Team that implemented this baseline survey project would like to appreciate and value the contributions of all organizations and individuals towards the accomplishment of this important task. Our utmost appreciation goes to ARD Inc. Addis Ababa branch lead by DR. Solomon Bekure, for the continuous support, encouragement, and valuable scientific technical and administration inputs in the course of implementation of this project. The follow-up and communication with research team of Mr. Shimelis Kebede, staff of ARD Inc. is also well acknowledged. Similarly, the inputs of Dr. Michel Roth, international staff associated with ELTAP has been very useful particularly in the initial design phase and during the development of the survey instruments. The staff of the regional bureaus of agriculture in Tigray, Amahra, Oromia, and SNNP and other stakeholders have made valuable contributions during the regional consultation workshops. We would like to extend our thanks to them, too. We would also like to thank the Wereda level experts and administrators in the ELTAP Focus woredas for their support during the field survey work for data collection. The EEA/EEPRI field survey workers have done a tremendous job in undertaking this demanding task. They, too, deserve appreciation. The logistic and administrative support of all EEA/EEPRI staff has been very useful for the accomplishment of the project. Special thanks to Mr. Daniel Aklilu for his very good job in preparation of the database. Finally, our great thanks are due to the farmers (men and women) who were willing to take their precious time in responding to the interview questions, participated in the key informants interview and focus group discussions, and shared their wisdom and experience. We hope that this kind of effort will help in improving their rights to land and welfare of their households in the future.

1. Introduction

1.1 Background of the Project

This report is prepared by the Ethiopian Economics Association / Ethiopian Policy Research Institute for The ARD Inc, Addis Ababa. EEA/EEPRI was selected to undertake a baseline survey of **Land Tenure and Administration in Ethiopian (ELTAP)**. ELTAP is a program implemented by the Federal Ministry of Agriculture and Rural Development in collaboration with the regional states of Amhara, Oromia, SNNPR, and Tigray. The program intends to support the government in establishing the Land Administration System. ARD INC. (Ethiopia Branch) provides technical assistance to ELTAP under contract with the USAID.

The motivation of the ELTAP is that land being an important asset for the majority of Ethiopian as their livelihood and employment secure access to and productive use of land and other natural resources is essential. Further justification of such intervention is also the fact that secure property rights and control of the benefit associated with its use are important basis for farmer motivation. Secure land rights can also improve land management and access to credit. Clearly defined and enforceable property rights are important both for the landholder and for the society. According to Deininger et. al (2003), it is helpful in the fight against poverty as land is a key asset of the poor and helps for effective use of family labor. Land value usually increases with secure right, which reduces risks and increase investments. Vague rights undermine investment incentives including human capital and makes functioning of markets difficult.

The Land Tenure and Administration Program (ELTAP) of the government of Ethiopia defines secure land tenure as a 'combination of perceived and actual benefits resulting from improvements in the legal framework, land management and land administration wherein individuals and families are more confident in their access, possession and investment in land.' Security of tenure is the certainty that a person's rights to land will be recognized by others and protected in cases of specific challenges. People with insecure tenure face the risk that their rights to land will be threatened by competing claims, and even lost because of eviction. Without security of tenure, households are significantly impaired in their ability to secure sufficient food and to enjoy sustainable rural livelihoods.

In many countries of the developing world, insecure land tenure prevents large parts of the population from realizing the economic and non-economic benefits such as greater investment incentives, transferability of land, and improved credit market access, more sustainable management of resources, and independence from discretionary interference by bureaucrats, that are normally associated with secure property rights to land.

Land certification should be carried out to establish or install a formal property rights on the land a person or community own/uses. The value of property rights (and the functioning of land markets) depends on formal mechanisms for defining and enforcing those rights, including the court system, police, the legal profession, land surveys, record keeping systems and titling agencies (Clarissa, 2005) as well as on social norms or religious customs.

The purpose of this baseline survey project was to establish a baseline data for impact monitoring of the on-going land administration, registration and title certification program launched by ELTAP/ARD in the four regional states- Tigray Amhara, Oromia and SNNP. This report documents issues of the process of the baseline survey project and results obtained.

1.2. Objectives of the Survey

The general objective of the project was to implement a baseline survey in twenty-four focus woredas and establish a baseline data on beneficiaries of the ELTAP-supported land certification program. The specific objectives were to:

- Undertake a baseline survey using semi-structured interview in selected ELTAP and non-ELTAP-supported Weredas and kebeles of the 4 Regions
- Conduct qualitative assessment of the perceived tenure security and actual benefits of the land registration program
- Develop on the results of the above, a database that will serve as benchmark for measuring future changes,
- Analyze and report the baseline data, stratified by region, gender, and other disaggregation criteria, as found necessary,

2. Methodology

2.1. Issues and indicators: conceptualization and operationalisation of variables

Establishment of key impact indicators

One of the important steps in the baseline survey project was the establishment of key impact indicators. Indicators were identified and measured in ways that conform to the project management plan (PMP) of ELTAP. The indicators and measurements were developed to assess actual and potential impact of the land certification and administration program. The survey was carefully designed to enable ELTAP to measure its strategic result, improved land tenure security in Ethiopia. The development of the indicators passed through some stages:

- The TOR provided by ARD Inc/ELTAP initially provided some key indicators upon which further development was made.

- The proposed indicators were refined and new ones were added, and adopted through subsequent discussion with ARD Inc.
- In addition, the regional consultation workshops that were held in the project regions helped to get feedback from the stakeholders who made thorough discussion on the indicators and survey instruments.
- The developed indicators served as the basis for developing the survey instruments.

The indicators are shown in Table 1 below.

Table 1: Selected Indicators and Performance Measures for the baseline survey

No.	Indicator variable	Indicator	Survey instrument
1	Level of soil conservation	<ul style="list-style-type: none"> ● Length of soil and stone bunds, and strips of hedges constructed by self, measured in linear meters ● Length of soil and stone bunds, and strips of hedges constructed by others (public, NGO, etc) but maintained/protected by self measured in linear meters 	<ul style="list-style-type: none"> ● Household questionnaire ● Household questionnaire
2	Level of water conservation	<ul style="list-style-type: none"> ● Number of water retention structures such as ponds and ditches constructed by self ● Number of water retention structures such as ponds and ditches constructed by others ((public, NGO, etc) but maintained by self 	<ul style="list-style-type: none"> ● Household questionnaire ● Household questionnaire
3	Investment in tree crops	<ul style="list-style-type: none"> ● Number of surviving (i.e. 3 months plus) non-fruit trees planted during the last 24 calendar months ● Number of surviving (i.e. 3 months plus) fruit trees planted during the last 24 calendar months ● Seedlings of all types bought or self-produced as a percentage of total seedlings planted ● Number of surviving perennial crops (e.g. coffee, enset, hops, t'chat, etc.) planted during the last 24 calendar months 	<ul style="list-style-type: none"> ● Household questionnaire ● Household questionnaire ● Household questionnaire ● Household questionnaire
4	Engagement in land transactions	<ul style="list-style-type: none"> ● If holding is involved in land transactions (renting-out or sharecropping-out) ● If involvement in land transactions is long-term (long-term transaction is any transaction, renting-out or sharecropping-out, leasing-out, that operates for more than a single harvest season) 	<ul style="list-style-type: none"> ● Household questionnaire ● Household questionnaire
5	Level of utilization of improved short-term farm inputs	<ul style="list-style-type: none"> ● Amount of chemical fertilizer applied per hectare of cultivated land per crop season ● Amount of organic fertilizer applied per hectare of cultivated land per crop season ● Amount of chemical fertilizer applied per hectare of cultivated land per crop season ● Amount of improved seed used on the farm as a percentage of total seed used ● Amount of farm credit taken 	<ul style="list-style-type: none"> ● Household questionnaire
6	Household and	<ul style="list-style-type: none"> ● Mean annual per capita calorie consumption (amount of 	<ul style="list-style-type: none"> ● Household

	per capita consumption of food grains	cereals and pulses consumed by the household, divided by the size of household, multiplied by calorific values)	questionnaire
7	Household and per capita farm income	• Mean annual household level and per capita farm income realized from farming activities	• Household questionnaire
8	Fencing or enclosing farm	• If holing (any of the plots) is fenced with live/dead materials	• Household questionnaire
9	Land related disputes experienced*	• Number of land related disputes and conflicts reported	• Household questionnaire
10	Perception of ownership of secure and full usufruct rights in land	<ul style="list-style-type: none"> • Perceived security/insecurity of rights based on own rating of factors security as measured on a Likert scale containing the following items: <ol style="list-style-type: none"> 1. expectation of eminent land redistribution in the foreseeable future of losing land due to redistribution 2. expectation to benefit from investing in long-term soil and water conservation measures 3. Attitude/ plan towards renting-out of land to others 4. Attitude/ plan towards sharecropping-out land to others 	• Household questionnaire
11	General condition of farm	• Observation of farm layout and appearance	• Photo record of farm layout, fence, type of house (qualitative)
12	Description of the sense of land tenure security	• Description of feelings about land tenure security	• Depth interview recorded on tape
13	Amount of wealth created	• Livestock ownership (different types of animals)	• Household questionnaire
14	Farm Size	• Impact on fragmentation and consolidation of farms	•
15	Investment	<ul style="list-style-type: none"> • level of capital attraction/investment to the rural areas through lease, rent, and own investment • 	•
16	Labor movement	• Impact on free labor movement (Rural-urban)	•
17	Governance	• Impact on perception of Land administration institutions	•

* **Note:** One of the expected indicators is “land related conflicts”. However, the outcome of this effect could be difficult to know. Land related disputes arising from undelineated boundaries decrease following certification. However, as the value of landholding increases as an effect of certification, other types of disputes, particularly those related to inheritance, lease claims, and the like, are very likely to be more prevalent. Note that land related disputes with serious consequences particularly among members of the same extended family were rampant in the pre-revolution Ethiopia in areas where land was privately owned.

Table 1 provides the key indicators identified for this baseline survey. Security of tenure cannot be measured directly and, to a large extent, it is what people perceive it to be. The attributes of tenure security may change from context to context. For example, a person may have a right to use a parcel of land for a 6 month growing season, and if that person is safe from eviction during the season, the tenure is secure. By extension, tenure security can relate to the length of tenure, in the context of the time needed to recover the cost of investment. Thus, the person with use rights for 6 months may not plant trees, or invest in irrigation works or take measures

to prevent soil erosion as the time is too short to benefit from the investments. In other words, the tenure can be insecure for long-term investments even if it is secure for short-term ones. The indicators provided above relate to the expected impacts of the land registration program launched in the four program regions and beneficiary farm households in selected program woredas. Impacts are expected in soil and water conservation, household investments in tree crops production, engagement in land transfers, food security and income, household wealth creation, land related conflicts and disputes, perception and behavior about property rights, knowledge of land laws, generation of investment capital, etc.

The baseline survey made use of methodologies and approaches that capture attitudinal perceptions of tenure security at two points in time – at some reference point in the past based on recall and currently. Regarding indicators of perception of land tenure security a composite variable was developed based on attitude measured by and Likert scale. In this case the household survey interviewee cases were asked to respond to 10 different questions that are related to security and responses to the enquires were summed up to give an indication of the level of security of individual landholders. In addition, changes in the indicative indicators are anticipated and ELTAP Strategic results on perceptions of impact, e.g. the inclination to invest, or inclination to engage in land market transactions were measured.

2.2. Methods of the Study

2.2.1. Approaches

2.2.1.1. Household survey

As the monitoring and evaluation must include both quantitative and qualitative approaches per the general guidelines provided, the baseline survey developed appropriate methodology that includes both statistical and non-statistical approaches to measurement and assessment of changes in tenure security and welfare impacts due to the land registration and certification program supported by ELTAP. The non-statistical approaches and methodologies help to reveal important information which can't be surfaced using a standard statistical approach. These approaches use a combination of different methods including key-informant interviews, case study and focus group discussions and research observations.

2.2.1.2. Household survey

The objective of the household survey is to collect data relevant for the baseline for monitoring and evaluation: among others, land and natural resources management, consumption and food security, farm and household income, farm investment and technology use, and engagement in land markets were covered. Other relevant information includes:

- Knowledge about the land policy, laws and regulations, land certification program;

- Perceived and actual tenure-insecurity including risk of land takings, appropriation;
- Land-related disputes and conflicts: type, number and origin of conflicts;
- etc.

To allow a gender-disaggregated analysis, data collection was made accordingly. The household survey instrument was designed in a way that it captures gender concerns and issues in relation to tenure security and impacts of the on-going land registration program. The survey instrument was meant to assess the men and women's perceptions and the actual benefits resulting from improvements in the legal framework, land management, and land administration.

2.2.1.3. Key informants interview

The key informants' interview consist of 2 elderly farmers (who were adults in 1975), 1 member of the village/ kebele land administration committee, 3 adults of active age (1 male farmer, 1 woman from female-headed, 1 from male-headed households). The interview was sought to capture the overall picture of the land tenure security, the process of land registration program and the realized benefits and expectations of the land users in the study areas.

Considering the workload of the survey supervisors and the physical and logistic demands to organize and conduct the discussion, the focus group discussions were made only in 6 kebeles out of the 11 sample kebeles served during the field work for data collection.

2.2.1.4. Focus group discussion

Through focus group discussions, detail qualitative information on land tenure security, effects and benefits of land registration program were gathered. The target groups for focus group discussion in the study kebeles were 2 women groups (from female-headed and male-headed households); 1 men-group (including elders, active adults, youth and landless) and; kebele land administration committee members (3). Some 13 to 15 people were involve in the FGD per study kebele. In the course of the discussion, triangulation was emphasized where the different groups were requested to give their opinion on similar issues.

Focus group discussions with women from female - headed households and females from male headed households were held separately to openly discuss their perceptions and attitudes on the tenure legislation, legal frameworks and its implementation process, land tenure security, the perceptions and actual benefits of the land title registration. The rationale of women groups for FGD is to provide an opportunity for self-expression of women who can be shy or otherwise resistant to opening up in front of others. The interviewers were to ensure the privacy of the respondents to get reliable and honest answers without being intimidated by the presence of others.

Considering the workload of the survey supervisors and the physical and logistic demands to organize and conduct the discussion, the focus group discussions were made only in 6 kebeles out of the 11 sample kebeles served during the field work for data collection.

2.2.1.5. The Gender Component

Information is important to gender mainstreaming at all levels from the formulation of policy and legislation to planning and monitoring of specific interventions. Hence, the gender related data collection and analysis for this baseline survey was found to be useful:

- To understand the present status of men and women in tenure security, the different needs of men and women to attain tenure security, and the decision making process in regard to land certification and tenure security.
- To analyze gender aspects of policies and legislation on land tenure administration.
- To develop gender indicators and checklist to monitor the impact of land tenure administration on men and women.

The baseline survey captured the gender-disaggregated data on land tenure security and land registration process. For this purpose, husband and wife, male-headed households and female-headed households were involved in household interviews, key informants and focus group discussions. In addition, wives in the polygamy households were also interviewed to see the effects of polygamy on the land rights of the affected women.

2.2.2. Instruments

The EEA/EEPRI research team has made a thorough preparation to develop the basic survey instruments. The development of the survey instruments also benefited from valuable comments and inputs of the ARD Inc staff in Addis Ababa, and the international experts associated with the ELTAP project.

Five types of instruments were developed and used for the baseline survey:

- A semi-structured questionnaire for household survey (for male and female HH heads),
- A semi-structured questionnaire for wives (including the polygamy cases) ,
- A Checklist for key informants interview (see Annex),
- A Checklist for focus group discussions (see annex),
- A checklist to guide observations and the taking of still pictures to capture current layouts appearance of farms houses, barns, fences, etc. (see part 23 of the household questionnaire)

The household survey questionnaire was prepared in three languages: Amharic (for use in Amhara and SNNPR regions), Afaan Oromo for Oromia, and Tigrigna in Tigray regions. The Survey instruments were pre-tested

and improved upon the feedback obtained from the one-day field practice held during training of the survey workers.

2.3. Regional Consultations and Finalization of Survey Instruments

As per the project design Regional Consultation Workshops were held in the four project regions namely, in Addis Ababa, Awassa, Bahr-Dar and Mekele, for Oromia, SNNPR, Amhara, and Tigray Regions, respectively. The objectives of the regional consultation were: i) To review and discuss the survey methodology; ii) To get feedback and final comments on the methodology and developed instruments from the regional EPLAUA experts and other relevant stakeholders.

Accordingly the Regional Consultation workshop for Oromia State was conducted on May 22, 2007 at the Global Hotel in Addis Ababa. Similarly, a workshop was held in Awassa town, *Yamare* Hotel, on May 25, 2007 for the SNNPR and workshop for Tigray region was held on June 4, 2007 at *Aksum* Hotel in Mekele town. Consultation for Amhara region was held on in August 2007 at the Papyrus Hotel in Bahir Dar.

At the workshops sufficient number of participants from Regional EPLAUAs, departments of land administration and natural resources of the BOARD, legal departments, Women Affairs, media and others were present. The workshops discussed the project design and survey instruments. Useful discussions and debates were held and valuable comments and suggestions that helped to augment the survey questionnaire were obtained. Following the discussions and feedback the household survey questionnaire was improved and completed before the final version was submitted to ARD Inc.

2.4. Study Areas and Sampling Design/ Methodology

A multi-stage sampling procedure was followed in the selection of the sample kebeles and households covered in the survey work.

Selection of **Regions**: the four regions were given by the client (ELTAP/ARD) where the program of land registration and tile certification has been currently taking place. These are Tigray, Amahra, Oromia and SNNPR.

Selection of **Woredas**: the survey woredas were also chosen by the client as its program woredas in the respective regions. Six woredas were selected from each of the regions. Names of the woredas and the size of the population of the respective woredas is provided in annex.

Selection of **kebeles**: the ELTAP program covers 15 rural kebeles in each of the program woredas of the regions. However, only 8 program kebeles were selected randomly selected for baseline survey. In addition to the program kebeles, 3 other non-ELTAP program rural kebeles were selected to be used as a control group for the survey. These kebeles were randomly selected from the available list of non-program kebeles in the selected program woredas. Considering the size of kebeles and logistic requirements in terms of travel and access the kebeles were spatially selected in the following manner:

- 3 program and 1 non-program kebeles were selected from among those that were far way from wereda capitals and/or main roads,
- 3 program and 1 non-program kebeles were selected from among those that were in a medium range distance form from wereda capitals and/or from main roads,
- 2 program and 1 non-program kebeles that were close to (5 km) wereda capitals and/or main roads.

There was a strong argument and debate at the regional consultation workshops that finding control kebeles where there is no/will not be land registration and title certification will be difficult, as the land administration programs of the regional governments are planned to cover all rural kebeles in the coming years. The participants argued that, for the farmers, it may not matter much whether certificates are obtained through ELTAP-supported process or the regional governments' procedures. Furthermore as the issue of land registration and certification has been publicly promoted over the last few years, rural land holders are thought to be largely aware of it i.e. there is already a 'contamination' of the control group it is difficult to find the right control. Hence, this issue was brought to the attention of ELTAP/ARD Inc. even before the survey was undertaken.

Selection of **Gotts/Qushets/Villages**: 25% of the gotts/qushets/villages in selected kebeles were sampled following the same distance criteria employed in the kebele sampling explained above.

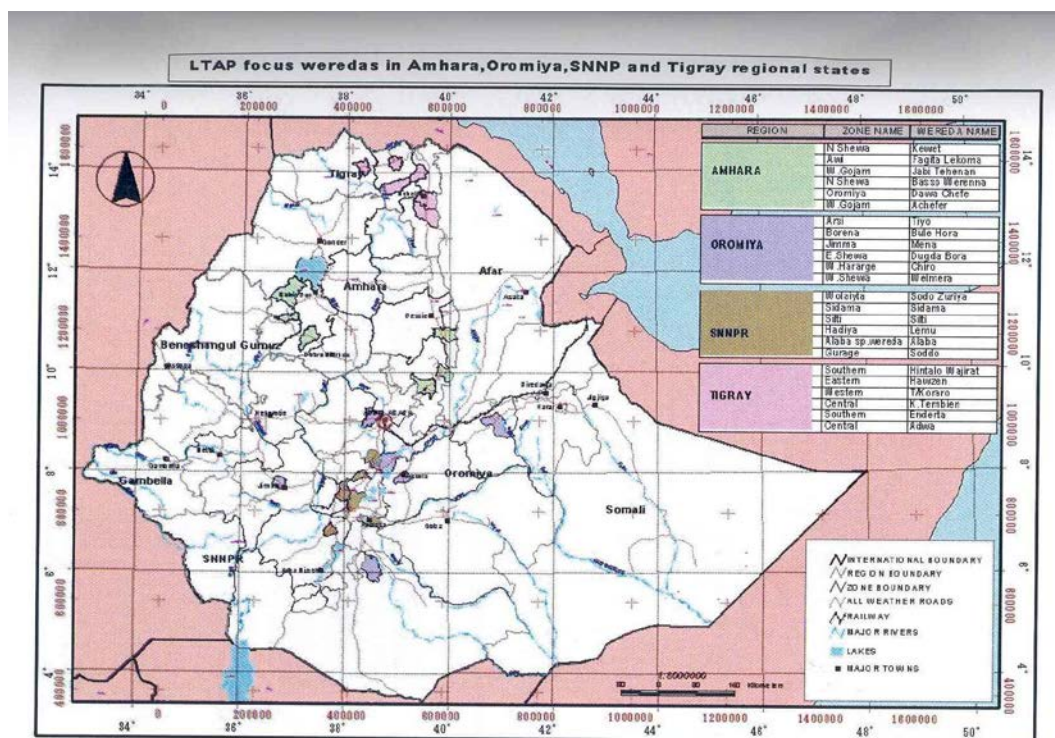
Selection of **households**: from each of the selected 8 rural kebeles in each of the 6 woredas of the regions, 15 households were randomly selected for interview. In addition, 10 households were randomly selected from each of the 3 non-program kebeles selected as a control. Taking the total number of landholder rural households in the 11 kebeles (8 program and 3 non-program) the percentage share of the sample 150 households in this total number of households in a selected wereda was computed. This % age (as above) of the households were randomly selected from a gott/qushets/village.

Survey supervisors made sure that women-headed households were included in the sample. The number of woredas, kebeles and households selected for survey are shown in Table 2.

Table 2: **Sample size and distribution in the study regions and woredas**

Sample groups	Program Regions				Total (No)
	Amhara	Tigray	Oromia	SNNP	
Samples from households with land certificates	Woredas = 6	Woredas = 6	Woredas = 6	Woredas = 6	Woredas = 24
	Kebeles = 8	Kebeles = 8	Kebeles = 8	Kebeles = 8	Kebeles = 192
	Households per kebele = 15	Households per kebele = 15	Households per kebele = 15	Households per kebele = 15	Total HH = 2880
Samples from households WITHOUT land certificates	Woredas = 6	Woredas = 6	Woredas = 6	Woredas = 6	Woredas = 24
	Kebeles = 3	Kebeles = 3	Kebeles = 3	Kebeles = 3	Kebeles = 72
	Households per kebele = 10	Households per kebele = 10	Households per kebele = 10	Households per kebele = 10	Total HH = 720
Total household	900	900	900	900	3600

Figure 1: Locations of ELTAP project Woredas in the Four Regions



Households were randomly selected from the available registry of households in the sample kebeles. The sample households selected from kebeles are composed of male and female-headed households. Wives were also interviewed. The total sample size was 3600 households.

These are 2880 from the program kebele and 720 from the non-program kebele households selected as a control group. i.e,

- 4 Regions X 6 Weredas X 8 Program Kebeles X 15 HH = 2880 Intervention HHs
- 4 Regions X 6 Weredas X 3 Non-Program Kebeles X 10 HH = 720 Control HHs

2.5. Actual field work/ data collection

2.5.1. Survey enumerators: selection, training and data collection

Qualified and well-experienced survey workers were employed and trained to conduct the baseline survey in selected woredas and Kebeles. The survey workers include supervisors/chief enumerators and enumerators. All the survey workers were required to speak local languages in respective study regions. The supervisors have previous experience in survey works and supervision of data collection in relevant surveys in agriculture and rural development. Their task was to organize the field level works, communicate with wereda and local authorities, to sample the study kebeles, villages and households following the guidelines provided to them, guide and supervise the interviews and conduct the focus group discussions and key informant interview.

The recruitment and training of survey workers took place in the following manner:

- 11 experienced field supervisors conversant in Amharic, Affaan Oromo and Tigrigna languages were recruited
- They were given a 2-days class room training and a 1-day field exercise (during which the instruments were pre-tested)
- A supervisor each was assigned to work in 2 woredas (in 3 woredas in Amhara region)
- Upon arrival in 1st woreda, the supervisors recruited groups of enumerators that included at least 2 women and gave them a 3-days training

Enumerators were working under a close supervision of chief enumerators/ survey supervisors. A supervisor was coordinating the works of a team of 6 enumerators in respective woredas of assignment. In each team there were at least two women field workers (enumerators). Enumerators were recruited by supervisors and subsequently trained (2 days of class room training and 1 day of field exercise). The field survey (data collection) work took 28 to 35 days including travel within the different regions (it took 35 days in cases where a survey team covered 3 Weredas in Amhara region).

2.5.2. Field supervision by the Research Team

The EEA/EEPRI research team made field visits to 8 Weredas during the field work and data collection. The field supervision had the objective of qualitative control, communication and discussion with the local authorities in program woredas and soliciting the facilitation of field work for data collection. In addition, the team observed some of the field level challenges and sought solutions on spot.

2.5.3. Problems and challenges faced during the field work

The ELTAP baseline survey was designed to be undertaken in 15 ELTAP focus kebeles and 3 other non-program kebeles. Hence, ELTAP/ARD has a list of focus kebeles, which was provided by the respective administrative regions. After the survey is undertaken this list is found to be outdated, specifically in some regions and woredas. The research team detected this when it found out that the list of surveyed kebeles is different from the list of kebeles provided by the wereda experts as program kebeles of ELTAP/ARD. For instance in *Dugda* woreda of Oromia region, the regional government decided to split the wereda in to two administrative districts. This resulted in different lists of kebeles than the originally designated ones. In the cases of *Dugda* wereda, out of 8 kebeles surveyed as ELTAP focus kebeles, only **three** are found to be program kebeles, the remaining 5 being not in the program. Out of 3 kebeles surveyed as control, 1 of them is program wereda, while the other two are not in the program, hence, can be considered as **control**.

Similarly, in *Bule Hora* woreda of Borana zone in Oromia, out of 8 kebeles surveyed as program kebeles, only 6 are program kebeles while the remaining 2 are out of that category. Hence, should be considered as controls; and out of 3 kebeles considered as control kebeles only 1 is a control while the other 2 are in fact program kebeles. In the case of *Dawa Chaffaa* woreda of Amhara region, the wereda experts did not exactly know which kebeles are included in the program which ones are not.

Some other problems and challenges of the fieldwork include:

1. Lack of clearly delineated intervention and control kebeles
2. Absence of /difficulty in accessing non-program (control) Kebeles in two Weredas (Kewet and Achefer in Amhara), requiring replacements from Tarmaber and Dangla woredas, respectively.
3. By the time of the field survey work, in some woredas the ELTAP program had not started operating in 8 kebeles and this necessitated the inclusion of non-program woredas above what had been stipulated (i.e., more than 3 per wereda).
4. Lack of transportation and difficulties and the consequent wastage of time.

5. Lack of cooperation in the case of some Kebele Administrators and local Development Agents in issuing work permits in the kebele and providing information necessary for sampling.
6. In the case of one Woreda, Wendo-Genet, Kebeles in which conflict (due to the land claim conflicts between the Sidama and Guji communities) was raging were wrongly identified for the survey, and had to be changed after wasting a number of days.
7. In Chiro wereda of Oromia enumerators abandoned the work after being trained claiming that the pay they were getting was low, despite the fact that all field workers across the study regions were paid similar payments for the field work.

2.6. Data Processing and Database Preparation

A professional and well-experienced statistician and computer programmer has prepared the data entry format using a software called Foxpro, one of the softwares suitable for the database preparation.

The following steps of data processing and database preparation were involved:

- Data editing, coding and recoding (took more than 3 weeks)
- The baseline database consisting of 350 variables and 3600 cases was entered, checked and verified (took over a period of 23 days).
- The software, Fox-pro, was used to prepare a data bases; and eventually transformed to SPSS format.
- The qualitative information from FGDs and key informant interviews were documented in word format.
- Photos of selected survey households were taken and stored in both hard copy and electronic format

2.7. Data Analysis

The survey data is analyzed using appropriate methods and instruments. Primarily, descriptive statistics like mean, frequency distribution, various kinds of graphs and charts, cross-tabulations are used. Discrete analysis like ANOVA, various relevant tests Chi-square are employed to establish the existence of statistically verifiable (significant) differences among different groups (for instance, between ELTAP and non-ELTAP Kebeles and farm households, between male and female headed households, etc.

3. Output and Summary of the Major Findings

This chapter provides a report on the size, nature and content of the database and the major findings from the data analysis. As this baseline survey project aims at establishing the database that provides a benchmark for future impact evaluation of the ELTAP intervention programs, major emphasis is given to the development of impact indicators, their measurement and the process and procedures of data collection. Detailed investigation of the socio-economic background and analysis of the farm households production input and output is not as such focused on.

3.1. The Database

One of the major outputs of the baseline study is the database. The database consists of four major components: the household survey data, the women (wives) survey data, the FGD and key informants interview report, and the photo documentation.

The major part of the database is data obtained from the household. It consists of the major survey data of households and wives (including polygamy wives). The household survey data consists of **349 variables** collected from **3603 farm households**, and **39 variables** on women and land right issues collected from **2754 wives (out of which 111 are the polygamy wives)**. The database has the following components (the main household data):

Part 2: Identification

Part 3: Demographic and Socio-economic Issues

Part 4: Land Possession and Land Use

Part 5: Perception of Land Rights

Part 6: Land Registration

Part 7: Engagement in Land Rental/Sharecropping Activities

Part 8: Land Related Disputes

Part 9: Knowledge of Land Laws and Governance

Part 10: Description of Feelings about Land Tenure and Tenure Security

Part 11: Perception of Ownership of Secure and Full Usufruct Rights

Part 12: Level of Soil Conservation Measures

Part 13: Water Harvesting and Conservation Measures

Part 14: Farm Closure/Fencing

Part 15: Investment in Tree Crops

Part 16: Investment in Perennial Crops

Part 17: Animals, Animal Products, Production and Sales

Part 18: Production and Sales of Food and Cash Crops

Part 19: Farm Inputs

Part 20: Non-Farm/Purchased Food and Non-food Consumption Items

Part 21: Ownership of Modern Possessions as Indicators of Wealth

Part 22: Permanent and Seasonal Migration

Part 23: General Condition of the Farm

3.2. Summary of the Major Findings

The motivation for data analysis and presentation here is to provide analysis of the existing situation of the land tenure security perception, performance of land and natural resource management, and welfare of the land users in the ELTAP focus woredas. Data is disaggregated by considering the major program regions, sex of households heads, intervention and control groups, etc. In fact as expected at this stage of the of the project intervention, the data does not show a significant difference between the program intervention and control households. Two reasons can be cited for this. First, although the ELTAP program has been initiated in a more systematic and organized way in establishing the land administration system focusing on selected rural kebeles in program woredas, as the idea of land administration (land registration and title certification) has been there in many rural kebeles of the country the last few years, other land users in the other non-program kebeles have had already access to the information and some practices undertaken buy the government programs. Second, it is too early for the ELTAP to bring about a significant difference on the program intervention households compared to the non-intervention households.

Hence, this report does not consider the disaggregation of data analysis by intervention and control group. Rather disaggregation by region and gender of interviewee cases (household) is mainly emphasized. In the remaining sections of this report, major parts of the data and issues drawn from the data are summarized in tables and graphs. Detail information including some statistical tests are provide in the Annex.

3.2.1. Household Demographic Characteristics

In the total sample surveyed, about 20% are women headed households while the make headed are about 80%. The share of women is rather higher in SNNPR (31%) and Oromia (24%). The aveate family size is in the order of 5.4, 6, 6.7 and 6.9 in Amhara, Tigray, SNNPR and Oromia, respectively (Table 3). Average age of the interviewed persons is more than 45 years in all regions.

Table 3: Some Demographic Aspects of the Sample Hsueholds by Region

Regional State		N	Minimu m	Maximu m	Mean	Std. Deviation
Tigray	Age of interviewee	899	20	83	46.94	11.732
	Family Size	899	1	12	6.03	2.216
	Male HH Heads (%)	703			78.2	
	Female HH heads (%)	196			21.8	
Amhara	Age of interviewee	897	20	89	46.23	13.517
	Family Size	899	1	13	5.40	2.256
	Male HH Heads (%)	685			76.2	
	Female HH heads (%)	214			23.8	
Oromia	Age of interviewee	902	20	100	47.46	15.022

	Family Size	902	1	24	6.87	3.089
	Male HH Heads (%)	768			85.1	
	Female HH heads (%)	134			14.9	
SNNP	Age of interviewee	900	18	98	45.92	13.635
	Family Size	902	1	31	6.69	2.698
	Male HH Heads (%)	748			82.9	
	Female HH heads (%)	154			17.1	

As shown in Table 4, majority of the interviewee were married while 12 % to 17% were widower/ed. Unmarried ones account for 1.8 % In SNNPR and higher at 6.8% in Tigray. Divorcee cases are 8.1% in Amhara, 7.1% in Tigray, 2.5% in Oromia and 1.3% in SNNPR.

Table 4: Marital Status of Interviewee (HH Hedas)

Regional State		Number	Percent	Valid Percent	Cumulative Percent
Tigray	unmarried	61	6.8	6.8	6.8
	Married	664	73.9	73.9	80.6
	Divorcee	64	7.1	7.1	87.8
	widower/ed	108	12.0	12.0	99.8
	Other	2	.2	.2	100.0
	Total	899	100.0	100.0	
Amhara	unmarried	46	5.1	5.1	5.1
	Married	619	68.9	68.9	74.0
	Divorcee	73	8.1	8.1	82.1
	widower/ed	161	17.9	17.9	100.0
	Total	899	100.0	100.0	
Oromia	unmarried	38	4.2	4.2	4.2
	Married	719	79.6	79.6	83.8
	Divorcee	23	2.5	2.5	86.4
	widower/ed	123	13.6	13.6	100.0
	Total	903	100.0	100.0	
SNNP	unmarried	16	1.8	1.8	1.8
	Married	722	80.0	80.0	81.8
	Divorcee	12	1.3	1.3	83.1
	widower/ed	152	16.9	16.9	100.0
	Total	902	100.0	100.0	

Analysis of the education status of household cases shows that illiteracy is one of the major development challenges in rural Ethiopia. As shown in Table 5, from the interviewed household heads 48.4%, 63%, 47.3% and 45.1% in Tigray, Amhara, Oromia and SNNP, respectively, are illiterate. Only 5.7% in Tigray, 3.6% in Amhara, 12% in Oromia and 17.6% in SNNPR have reported to have completed formal school.

Table 5 : Educational Status of Household Head by Region

Regional State		No. of cases	Percent	Cumulative Percent
Tigray	Illiterate	435	48.4	48.9
	Read only	84	9.3	58.4
	Read & write only	144	16.0	74.6
	Grade 4 complete	172	19.1	93.9
	Grade 8 complete	40	4.4	98.4
	Grade 10-12 complete	10	1.1	99.6
	above grade 12	4	.4	100.0
	Sub-Total	889	98.9	
	Missing cases	10	1.1	
	Total	899	100.0	
Amhara	Illiterate	563	62.6	63.0
	Read only	44	4.9	67.9
	Read & write only	203	22.6	90.6
	Grade 4 complete	52	5.8	96.4
	Grade 8 complete	26	2.9	99.3
	Grade 10-12 complete	6	.7	100.0
	Sub-Total	894	99.4	
	Missing cases	5	.6	
	Total	899	100.0	
Oromia	Illiterate	427	47.3	47.6
	Read only	66	7.3	55.0
	Read & write only	111	12.3	67.3
	Grade 4 complete	186	20.6	88.1
	Grade 8 complete	77	8.5	96.7
	Grade 10-12 complete	27	3.0	99.7
	above grade 12	3	.3	100.0
	Sub-Total	897	99.3	
	Missing cases	6	.7	
	Toatl	903	100.0	
SNNP	Illiterate	407	45.1	45.4
	Read only	27	3.0	48.4
	Read & write only	144	16.0	64.4
	Grade 4 complete	161	17.8	82.4
	Grade 8 complete	99	11.0	93.4
	Grade 10-12 complete	51	5.7	99.1
	above grade 12	8	.9	100.0
	Sub-Total	897	99.4	
	Mising cases	5	.6	
	Toatl	902	100.0	

Table 6: Educational Status of the (Primary) Spouse

Regional State		No of cases	Percent	Cumulative Percent
Tigray	Illiterate	574	63.8	79.3
	Read only	43	4.8	85.2
	Read & write only	28	3.1	89.1
	Grade 4 complete	59	6.6	97.2
	Grade 8 complete	17	1.9	99.6
	Grade 10-12 complete	2	.2	99.9
	above grade 12	1	.1	100.0
	Sub-Total	724	80.5	
	Mising cases	175	19.5	
	Toatl	899	100.0	
Amhara	Illiterate	559	62.2	83.8
	Read only	25	2.8	87.6
	Read & write only	42	4.7	93.9
	Grade 4 complete	26	2.9	97.8
	Grade 8 complete	14	1.6	99.9
	Grade 10-12 complete	1	.1	100.0
	Sub-Total	667	74.2	
	Mising cases	232	25.8	
	Total	899	100.0	
Oromia	Illiterate	585	64.8	73.8
	Read only	45	5.0	79.4
	Read & write only	40	4.4	84.5
	Grade 4 complete	89	9.9	95.7
	Grade 8 complete	28	3.1	99.2
	Grade 10-12 complete	6	.7	100.0
	Sub-Total	793	87.8	
	Mising cases	110	12.2	
	Total	903	100.0	
SNNP	Illiterate	579	64.2	75.9
	Read only	31	3.4	79.9
	Read & write only	31	3.4	84.0
	Grade 4 complete	70	7.8	93.2
	Grade 8 complete	38	4.2	98.2
	Grade 10-12 complete	14	1.6	100.0
	Sub-Total	763	84.6	
	Mising cases	139	15.4	
	Total	902	100.0	

Table 6 shows that primary spouse (manly women) are more illiterate than the men/husbands. More than 60% of the primary spouses are illiterate. Although the adult literacy camping in held Ethiopia during 1970s and 1980s seems to have served both men and women, the data shows that there has been still and gender biases where more women are disadvantaged than men.

3.2.2. Household Resource Basis

Household labour force, land, and livestock are the major productive resource of the farm households. The data shows that there is slight variation of the adult labour in the households across regions (Table 7). An average number of adult labour force is 3.19 in Tigray while it is slightly higher in SNNPR at 3.6. Mean total land holding is around 1 hectare in SNNPR but 1.5 hectares in Oromia. In Tigray and Amhara the average is around 1.3 hectares. The average livestock holding is about similar in the four regions. Out of the list of more than 20 items designated as modern possession, an average household does not have more than 4 of them. It shows that the rural economy is not yet well monetized i.e much less market integrated (Table 8). Further more female have lower than the men. The possession of modern assets does not show significant difference among the four regions.

Table 7 : Resources Basis of Farm Household by Region

Region	No. of Cases	Number of Working Adults (No)	Mean Livestock holding (TLU)	Mean Total Land holding (ha)	Mean Rented-OUT Land (ha)	Rented Out land as % of Holding
Tigray	734	3.19	4.55	1.27	0.10	9%
Amhara	889	3.18	4.31	1.29	0.20	16%
Oromia	775	3.52	5.47	1.51	0.11	9%
SNNP	898	3.59	4.27	1.06	0.03	3%
Total						9%

Table 8: Index of Modern Possessions * Region * Sex

Region	Sex of Housheold Heads	Number of Cases	Mean Modern Possession
Tigray	Male	702	3.5
	Femle	196	2.8
Amhara	Male	685	3.4
	Fem ale	214	2.1
Oromia	Male	758	3.0
	Female	134	2.5
SNNP	Male	748	3.3
	Female	154	2.5

3.2.3. Household Food Production and Cash Flow

Table 9 shows the average level of food grain and milk production by the sample households. For the SNNPR where *enset* is an important staple food, *esnet* production is converted to grain equivalent¹. During the year that proceeded the survey year (i.e. the 2006/7 cropping season) an average household has reported to have produced 11.5 qt, 20.3 qt, 16 qt and 13 qt of grain in Tigray, Amhara, Oromia and SNNPR, respectively. In Tigray and Amhara, female headed households produced about 50% of that of men-headed while in Oromia and SNNPR they produced slightly lower than men. The data shows that for an average 6.25 household members for all regions and 13.2 qt grain production, the per capita grain supply (gross) is lower than the recommended amount of 225 kg at 211 kg.

Milk production during the reference year was lower i.e ranging between 137 liters fro Tigray to 229 liters in SNNPR.

Table 9: Food Production and Cash Income by Region Sex of Household Head

Region	Sex	Food Production		Household Income (Birr)		Household Cash Cash Flow (Birr)			
		Grain (qt)	Milk (liters)	Gross Fram income	Gross HH income	Farm Cash	Non-farm Income (Birr)	Cash Outflow (Birr)	Cash Balance (Birr)
Tigray	Male	11.5	137.9	5919	6930	1733.2	506.0	932.4	1306.8
	Femle	6.6	60.7	3043	3825	849.0	390.9	773.7	466.3
	Total	10.4	121.0	5292	6253	1540.2	480.9	897.8	1123.4
Amhara	Male	20.3	175.5	9677	9844	3397.5	83.7	1319.6	2161.5
	Femle	12.1	109.7	5714	5891	1662.7	88.6	946.9	804.4
	Total	18.3	159.8	8733	8903	2984.5	84.9	1230.9	1838.5
Oromia	Male	15.9	166.8	12987	13694	3043.0	358.2	2341.7	1059.4
	Fem	11.2	83.5	5415	5631	1403.7	108.4	1951.4	-439.3
	Total	15.2	154.3	11859	12493	2796.7	320.7	2283.1	834.3
SNNP	Male	12.9	228.8	12547	13149	3098.1	302.1	2251.3	1148.9
	Fem	11.8	184.2	13908	14115	2437.0	103.6	1901.9	638.7
	Total	12.7	221.2	12780	13314	2985.3	268.2	2191.6	1061.8

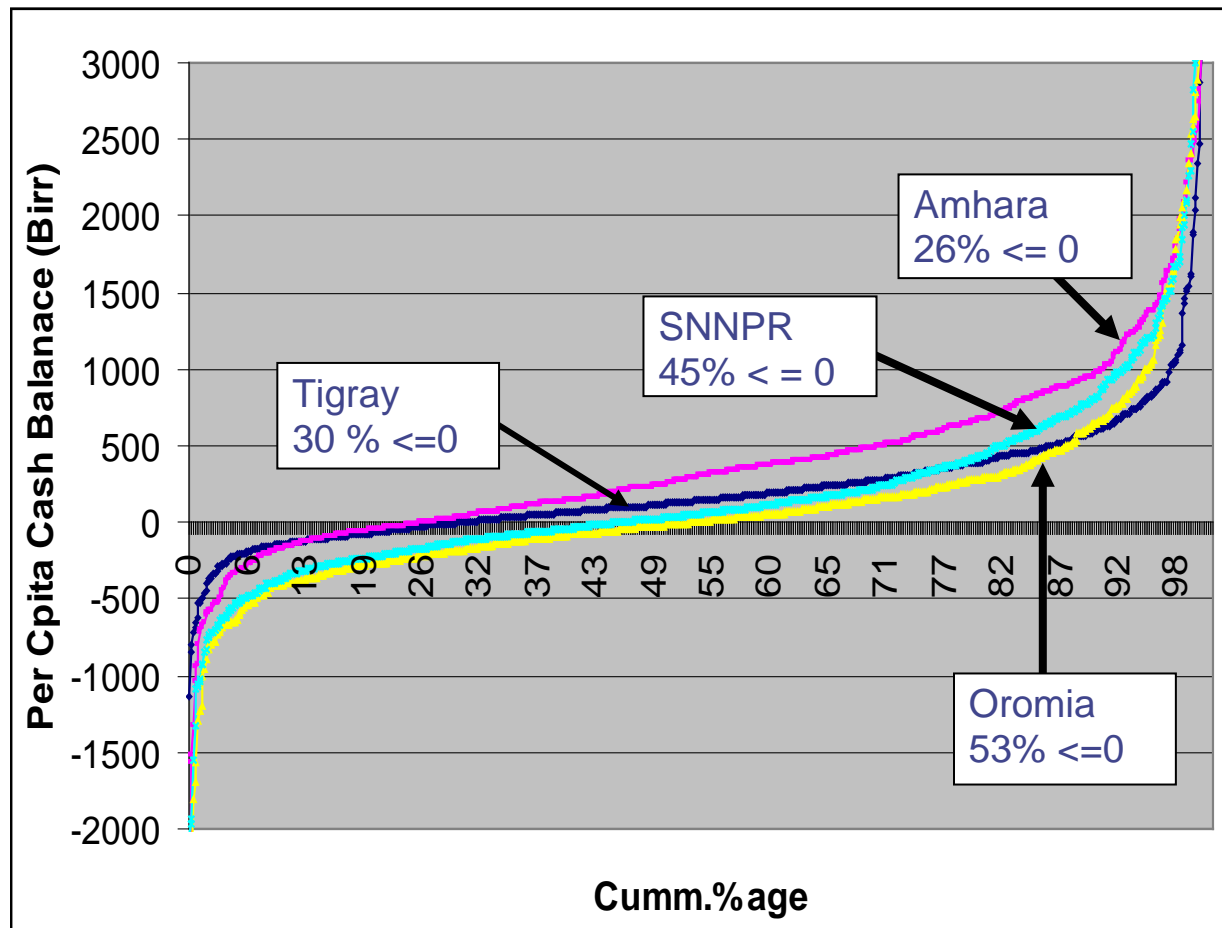
Gross farm income is computed by multiplying the quantity of farm products by average regional; prices for farm and livestock products. For livestock in addition to valuation of the products, value of livestock

¹ Using a factor of 0.54 (referred to from a literature) *enset* the quantity of *enset* production is changed to grain equivalent.

sales is considered (the value add between sales and purchase.). The data shows that average gross farm income for female headed households was highest at 13908 birr for SNNPR and lowest for Tigray at 3043 birr. For male headed households highest average is 12987 birr in Oromia and the lowest is 5919 Birr for Tigray. A gross household income is obtained by adding the non-farm income to the gross farm income.

A household cash flow is an important indicator of should performance. Cash income and cash outflow (expenditure) of the sample, households for the year that preceded the survey year was considered to compute the household cash balance. On average, households had positive cash balance during that year, except for the female headed households in Oromia. As the mean figures of cash balance may not show a true picture, frequency distribution is provided as shown in Figure 2. The distribution of a per capita cash balance shows that quite a large number of the households, 30%, 26%, 45% and 53% in Tigray, Amhara, SNNPR and Oromia, respectively, had zero or negative cash balances during the year. This may mean that households have either consumed from their previous savings, or might have borrowed fro cash spending, or might have also made more cash purchases (e.g. livestock) than they have made sales of asset.

Figure 2: **Regional Per Capita Cash Balance (Birr)**



3.2.4. Perception of Land Rights, Feelings of Tenure Security and Knowledge of Land Laws

Interviewee household heads were requested about the type of land rights they have. All rights except selling land is the most common perception of the right one has on the land under his possession. This is true for both male and female headed households across all regions (Table 10). The right to use is the next more prevalent right perceived. For women, the **Rights to use, and to contract /rent/share-out** is also very important.

Table 10: Perceived Land Rights * Region * Sex

Sex	Type of Right One Has on the Land Under One's Possession	Regional State				Total
		Tigray	Amhara	Oromia	SNNP	
Male	Right to use	27.3%	11.9%	59.9%	26.7%	32.4%
	Right to contract/rent/share-out	2.6%	1.4%	1.7%	4.2%	2.5%
	Right to bequeath	1.0%	3.2%	1.2%	3.3%	2.2%
	Right to sell	2.0%	3.7%	.8%	13.4%	4.9%
	Rights to use, and to contract/rent/share-out	27.3%	22.1%	12.7%	23.9%	21.3%
	All Rights except to sell	39.3%	55.4%	23.2%	28.5%	36.0%
	Total	697	655	766	719	2837
Female	Right to use	37.8%	11.4%	66.4%	29.6%	33.8%
	Right to contract/rent/share-out	6.2%	1.5%	1.5%	2.6%	3.1%
	Right to bequeath	1.0%	4.0%	.7%	5.9%	2.9%
	Right to sell	4.1%	3.0%	.7%	13.8%	5.3%
	Rights to use, and to contract/rent/share-out	19.7%	28.7%	10.4%	21.1%	20.9%
	All Rights except to sell	29.0%	46.5%	17.2%	24.3%	30.8%
	Total	193	202	134	152	681

Several questions (10) were asked in relation to the feeling of tenure security. The responses were rated in such a way that a respondent who agrees and disagrees to a statement scores between 1 to 4, the score 1 being lowest security and 4 the highest security. The total of the 10 questions sum up to the lowest score of 10 and highest score of 40 points. The total scores are grouped into very low, low, high and very high. Accordingly, about two-third of the respondents in Tigray and four-fifth in Amhara said they feel to have high tenure security. Similarly, about 60% in Oromia, and about 75% in SNNPR have high tenure security feelings (Table 11). This level of feeling is almost similar for female and males.

On the other hand about 40% of the sample cases in Oromia, 30% in Tigray, about 20% in SNNPR and more than 10% in Amhara feel that they have low land tenure security.

Table 11: Feeling of Tenure Security (Categorized Total Likert Score) * Sex of interviewee Crosstabulation

Regional State	Feeling of Tenure Security		Sex of interviewee		Total
			Male	Female	
Tigray	Very Low	Count	3	1	4
		% within Sex of interviewee	.4%	.6%	.5%
	Low	Count	193	53	246
		% within Sex of interviewee	28.9%	29.4%	29.0%
	High	Count	440	121	561
		% within Sex of interviewee	66.0%	67.2%	66.2%
	Very High	Count	31	5	36
		% within Sex of interviewee	4.6%	2.8%	4.3%
Amhara	Total	Count	667	180	847
		% within Sex of interviewee	100.0%	100.0%	100.0%
	Very Low	Count	1	0	1
		% within Sex of interviewee	.2%	.0%	.1%
	Low	Count	67	36	103
		% within Sex of interviewee	10.7%	18.5%	12.6%
	High	Count	526	155	681
		% within Sex of interviewee	84.2%	79.5%	83.0%
Oromia	Very High	Count	31	4	35
		% within Sex of interviewee	5.0%	2.1%	4.3%
	Total	Count	625	195	820
		% within Sex of interviewee	100.0%	100.0%	100.0%
	Low	Count	263	44	307
		% within Sex of interviewee	42.6%	38.3%	41.9%
	High	Count	349	69	418
		% within Sex of interviewee	56.5%	60.0%	57.0%
SNNP	Very High	Count	6	2	8
		% within Sex of interviewee	1.0%	1.7%	1.1%
	Total	Count	618	115	733
		% within Sex of interviewee	100.0%	100.0%	100.0%
	Low	Count	129	35	164
		% within Sex of interviewee	19.2%	24.6%	20.1%
	High	Count	519	105	624
		% within Sex of interviewee	77.1%	73.9%	76.6%
SNNP	Very High	Count	25	2	27
		% within Sex of interviewee	3.7%	1.4%	3.3%
	Total	Count	673	142	815
		% within Sex of interviewee	100.0%	100.0%	100.0%

Majority of the interview are aware of the existence of administrative /judiciary institutions /arrangements that are capable of enforcing existing crucial land laws. For male interviewees this account for 85.4% in Tigray, 73.2% in Amhara, 74% in Oromia, and 94% in SNNPR. Similarly, majority of the women have such a belief although at a lower percentage share compared to men (Table 12). For men between 4.7% in SNNPR and 12.3% Amhara believe that such institutions do not exist. For women, while there are no who believe that way in SNNPR, 11.5% in Tigray, 8.4% in Amhara and 4.5% in Oromia who think that

there are no such institutions or arrangements. There are some cases who do not know about this. For the men category they account for 6.7% in Tigray, 14.5% in Amhara, 12% in Oromia, and 1.3% in SNNPR. For the female these are 11% in Tigray, 35% in Amhara, 36% in Oromai, 9.2% in SNNPR. The data shows that more than a third of the interviewed women in Amhara and Oromia have no any information/ knowledge of the existence of administrative /judiciary institutions /arrangements that are capable of enforcing existing crucial land laws.

Table 12: Belief in Existence of Administrative / Judiciary Institutions /Arrangements That are CAPABLE of Enforcing Existing Crucial Land Laws

Regional State				Sex of interviewee		Total
				Male	Female	
Tigray	Belief	They exist	Count	595	149	744
			% within Sex of interviewee	85.4%	77.6%	83.7%
		They don't exist	Count	55	22	77
			% within Sex of interviewee	7.9%	11.5%	8.7%
		Don't know	Count	47	21	68
			% within Sex of interviewee	6.7%	10.9%	7.6%
	Total		Count	697	192	889
			% within Sex of interviewee	100.0%	100.0%	100.0%
Amhara	Belief	They exist	Count	478	114	592
			% within Sex of interviewee	73.2%	56.4%	69.2%
		They don't exist	Count	80	17	97
			% within Sex of interviewee	12.3%	8.4%	11.3%
		Don't know	Count	95	71	166
			% within Sex of interviewee	14.5%	35.1%	19.4%
	Total		Count	653	202	855
			% within Sex of interviewee	100.0%	100.0%	100.0%
Oromia	Belief	They exist	Count	566	79	645
			% within Sex of interviewee	73.9%	59.4%	71.7%
		They don't exist	Count	92	6	98
			% within Sex of interviewee	12.0%	4.5%	10.9%
		Don't know	Count	108	48	156
			% within Sex of interviewee	14.1%	36.1%	17.4%
	Total		Count	766	133	899
			% within Sex of interviewee	100.0%	100.0%	100.0%
SNNP	Belief	They exist	Count	674	139	813
			% within Sex of interviewee	94.0%	90.8%	93.4%
		They don't exist	Count	34	0	34
			% within Sex of interviewee	4.7%	.0%	3.9%
		Don't know	Count	9	14	23
			% within Sex of interviewee	1.3%	9.2%	2.6%
	Total		Count	717	153	870
			% within Sex of interviewee	100.0%	100.0%	100.0%

Majority of the interview are aware of the existence of administrative / judiciary institutions /arrangements that are FAIRE ENOUGH to enforce existing crucial land laws. However, 35% of women and 14% of men interviewed in Oromia, and 35.1% of women and 14.4% of men in Amhara do not have knowledge about this issue. For male interviewees 8% in Tigray, 13% in Amhara, 13.3% in Oromia, and 7.4% in SNNPR believe that there are no such institutions or arrangements (Table 13).

Table 13: Belief in Existence of Administrative / Judiciary Institutions /Arrangements That are FAIRE ENOUGH to Enforce Existing Crucial Land Laws * Sex of interviewee

Regional State				Sex of interviewee	Total	
				Male	Female	
Tigray	Belief , FAIRE institutions	They exist	Count	588	151	739
			% within Sex of interviewee	84.4%	78.6%	83.1%
		They don't exist	Count	56	18	74
			% within Sex of interviewee	8.0%	9.4%	8.3%
		Don't know	Count	53	23	76
			% within Sex of interviewee	7.6%	12.0%	8.5%
		Total	Count	697	192	889
			% within Sex of interviewee	100.0%	100.0%	100.0%
Amhara	Belief , FAIRE institutions	They exist	Count	477	116	593
			% within Sex of interviewee	72.9%	57.4%	69.3%
		They don't exist	Count	83	15	98
			% within Sex of interviewee	12.7%	7.4%	11.4%
		Don't know	Count	94	71	165
			% within Sex of interviewee	14.4%	35.1%	19.3%
		Total	Count	654	202	856
			% within Sex of interviewee	100.0%	100.0%	100.0%
Oromia	Belief , FAIRE institutions	They exist	Count	559	79	638
			% within Sex of interviewee	72.8%	59.0%	70.7%
		They don't exist	Count	102	8	110
			% within Sex of interviewee	13.3%	6.0%	12.2%
		Don't know	Count	107	47	154
			% within Sex of interviewee	13.9%	35.1%	17.1%
		Total	Count	768	134	902
			% within Sex of interviewee	100.0%	100.0%	100.0%
SNNP	Belief , FAIRE institutions	They exist	Count	674	136	810
			% within Sex of interviewee	94.0%	88.9%	93.1%
		They don't exist	Count	34	2	36
			% within Sex of interviewee	4.7%	1.3%	4.1%
		Don't know	Count	9	15	24
			% within Sex of interviewee	1.3%	9.8%	2.8%
		Total	Count	717	153	870
			% within Sex of interviewee	100.0%	100.0%	100.0%

A large majority of male and female interviewee in Tigray, Oromia and SNNPR and close to two- third of them in Amhara say that they have high confidence in the government that it will protect their right as land user. For male interviewee, those who have less confidence are 5.3% in Tigray, 7.5% in Amhara, 3% in Oromia and 2.9% SNNP (Table 14). Except in Tigray, slightly more women than men are less confident in government in protection of the rights of land user.

Table 14: If Confident That the Government Will Protect One's Right as Land User * Sex of interviewee

Region				Sex of interviewee		Total
				Male	Female	
Tigray	Confidence, Government Will Protect One's Right as Land User	Very confident	Count	562	161	723
			% within Sex of interviewee	80.9%	84.7%	81.7%
		Confident	Count	92	19	111
			% within Sex of interviewee	13.2%	10.0%	12.5%
		Less confident	Count	37	9	46
			% within Sex of interviewee	5.3%	4.7%	5.2%
		Not at all confident	Count	4	1	5
			% within Sex of interviewee	.6%	.5%	.6%
	Total		Count	695	190	885
Amhara	Confidence, Government Will Protect One's Right as Land User		% within Sex of interviewee	100.0%	100.0%	100.0%
		Very confident	Count	423	113	536
			% within Sex of interviewee	64.7%	55.7%	62.5%
		Confident	Count	175	65	240
			% within Sex of interviewee	26.8%	32.0%	28.0%
		Less confident	Count	49	24	73
			% within Sex of interviewee	7.5%	11.8%	8.5%
		Not at all confident	Count	7	1	8
			% within Sex of interviewee	1.1%	.5%	.9%
	Total		Count	654	203	857
Oromia	Confidence, Government Will Protect One's Right as Land User		% within Sex of interviewee	100.0%	100.0%	100.0%
		Very confident	Count	666	98	764
			% within Sex of interviewee	87.1%	73.7%	85.1%
		Confident	Count	67	16	83
			% within Sex of interviewee	8.8%	12.0%	9.2%
		Less confident	Count	22	13	35
			% within Sex of interviewee	2.9%	9.8%	3.9%
		Not at all confident	Count	10	6	16
			% within Sex of interviewee	1.3%	4.5%	1.8%
	Total		Count	765	133	898
SNNP	Confidence, Government Will Protect One's Right as Land User		% within Sex of interviewee	100.0%	100.0%	100.0%
		Very confident	Count	596	122	718
			% within Sex of interviewee	83.6%	79.7%	82.9%
		Confident	Count	94	26	120
			% within Sex of interviewee	13.2%	17.0%	13.9%
		Less confident	Count	23	5	28
			% within Sex of interviewee	3.2%	3.3%	3.2%
	Total		Count	713	153	866

	% within Sex of interviewee	100.0%	100.0%	100.0%
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A large share of the interviewee believe that there are land laws that protect their land rights. Comparing male and female, about 9% and 7% in Tigray, 4% and 2.5% in Amhara, 4% and 2.2% in Oromia and 2% and 2.6% in SNNPR, respectively for men and women, do not think that there exist such laws. There are some who say they do not know about the existing laws and have no idea at all (Table 15).

Table 15: Belief if the Existing Land Laws Adequately Protect One's Rights As Possessor of Land * Sex of interviewee

Interviewee				Sex of interviewee		Total
Region				Male	Female	
Tigray	Belief if the Existing Land Laws Adequately Protect One's Rights As Possessor of Land	Yes, I think so	Count	597	164	761
			% within Sex of interviewee	86.3%	85.4%	86.1%
		No, I don't think so	Count	62	13	75
			% within Sex of interviewee	9.0%	6.8%	8.5%
		I don't know the existing laws	Count	18	9	27
			% within Sex of interviewee	2.6%	4.7%	3.1%
		I have no idea about it	Count	15	6	21
			% within Sex of interviewee	2.2%	3.1%	2.4%
	Total		Count	692	192	884
		% within Sex of interviewee	100.0%	100.0%	100.0%	
Amhara	Belief if the Existing Land Laws Adequately Protect One's Rights As Possessor of Land	Yes, I think so	Count	536	145	681
			% within Sex of interviewee	81.8%	71.8%	79.5%
		No, I don't think so	Count	27	5	32
			% within Sex of interviewee	4.1%	2.5%	3.7%
		I don't know the existing laws	Count	18	13	31
			% within Sex of interviewee	2.7%	6.4%	3.6%
		I have no idea about it	Count	72	39	111
			% within Sex of interviewee	11.0%	19.3%	13.0%
	Other	Count	2	0	2	
	% within Sex of interviewee	.3%	.0%	.2%		
Total		Count	655	202	857	
		% within Sex of interviewee	100.0%	100.0%	100.0%	
Oromia	Belief if the Existing Land Laws Adequately Protect One's Rights As Possessor of Land	Yes, I think so	Count	671	98	769
			% within Sex of interviewee	87.4%	73.1%	85.3%
		No, I don't think so	Count	30	3	33
			% within Sex of interviewee	3.9%	2.2%	3.7%
		I don't know the existing laws	Count	24	13	37
			% within Sex of interviewee	3.1%	9.7%	4.1%
		I have no idea about it	Count	43	20	63
			% within Sex of interviewee	5.6%	14.9%	7.0%
	Total		Count	768	134	902
		% within Sex of interviewee	100.0%	100.0%	100.0%	
SNNP	Belief if the Existing Land Laws Adequately Protect One's	Yes, I think so	Count	692	144	836
			% within Sex of interviewee	96.5%	94.1%	96.1%
		No, I don't think so	Count	14	4	18

	Rights As Possessor of Land		% within Sex of interviewee	2.0%	2.6%	2.1%
		I don't know the existing laws	Count	7	2	9
			% within Sex of interviewee	1.0%	1.3%	1.0%
		I have no idea about it	Count	4	3	7
			% within Sex of interviewee	.6%	2.0%	.8%
	Total		Count	717	153	870
			% within Sex of interviewee	100.0%	100.0%	100.0%

3.2.5. Land Related Conflicts/Disputes

Whether they have certificate for the land they possess or not a large majority of the interview in all regions did not have any land related dispute during the last two years. Land related disputes have been prevalent in all regions. The data shows that 16% of the cases in Tigray, 31% in Amhara, 27% in Oromia, and 24% in SNNPR had land related disputes during the last two years (Table 16). There are some households who entered in to some land related disputes even having land certificates. Cases who reported land disputes while they have certificates are 9.1% in Tigray, 18% in Amhara, 13.3% in Oromia and 10.5% in SNNPR. Similarly, those who do not have certificate in land are also engaged in some land related disputes. They account for 7.1% in Tigray, 13.6% in Amhara, 13.6% in Oromia, 13.5% in SNNPR.

One of the major causes for land dispute has to do with boundary conflicts. This is also confirmed in the focus group discussions and key informant interviews made in the study kebeles in all regions.

Table 16: If Household Has Ever Been Involved in Any Land Related Dispute During the Last Two Years? * If Household Possess Certificate for the Land it Makes Use of Crosstabulation

Regional State	Involvement in Dispute?		If Household Possess Certificate for the Land it Makes Use of			Total
			Yes	No	land was not registered	
Tigray	Yes	Count	26	42		68
		% within If Household Possess Certificate for the Land it Makes Use of	9.1%	7.1%		7.8%
	No	Count	259	549		808
		% within If Household Possess Certificate for the Land it Makes Use of	90.9%	92.9%		92.2%
	Total	Count	285	591		876
		% within If Household Possess Certificate for the Land it Makes Use of	100.0%	100.0%		100.0%
Amhara	Yes	Count	99	45		144
		% within If Household Possess Certificate for the Land it Makes Use of	17.7%	13.5%		16.1%
	No	Count	460	289		749
		% within If Household Possess Certificate for the Land it Makes Use of	82.3%	86.5%		83.9%
	Total	Count	559	334		893

		% within If Household Possess Certificate for the Land it Makes Use of	100.0%	100.0%		100.0%
Oromia	Yes	Count	47	72		119
		% within If Household Possess Certificate for the Land it Makes Use of	13.3%	13.6%		13.5%
	No	Count	307	457	1	765
		% within If Household Possess Certificate for the Land it Makes Use of	86.7%	86.4%	100.0%	86.5%
	Total	Count	354	529	1	884
		% within If Household Possess Certificate for the Land it Makes Use of	100.0%	100.0%	100.0%	100.0%
SNNP	Yes	Count	50	54	4	108
		% within If Household Possess Certificate for the Land it Makes Use of	10.5%	13.5%	22.2%	12.1%
	No	Count	428	345	14	787
		% within If Household Possess Certificate for the Land it Makes Use of	89.5%	86.5%	77.8%	87.9%
	Total	Count	478	399	18	895
		% within If Household Possess Certificate for the Land it Makes Use of	100.0%	100.0%	100.0%	100.0%

3.2.6. Soil and Water Conservation and Management Practices

Rural households in the study areas have been practicing various soil and water conservation measures. Investment in such measures comes either from the households' own resources or from support from others like governmental organizations or non-government organizations. The two common physical soil conservation measures are soil and stone bunds. On average the length of soil and stone bunds (constructed both by the households themselves and with the help of others) is more in Tigray than other regions. It was learnt from the discussion at regional consultation workshop that soil and water conservation practices have been underway in Tigray over the last 25 or more years. Marked difference, of the average length of stone and soil bunds constructed, exists between male and female-headed households in the case of Amhara, Oromia and SNNPR. On the contrary, both types of households made similar efforts in soil conservation in Tigray (Table 17).

Table 17: Table: Mean Lengths of Bunds Constructed by Region Sex of Household Heads

Regiona l State	Sex of HH Head		Soil bunds constructed by the household itself (meters)	Stone bunds constructed by the household itself (meters)	Soil bunds constructed by or with the help of others (meters) *	Stone bunds constructed by or with the help of others (meters)*
Tigray	Male	Mean	35.82	51.57	45.05	43.63
		N	703	703	703	703
	Female	Mean	32.18	37.72	27.05	27.79

		N	196	196	196	196
	Total	Mean	35.02	48.55	41.13	40.18
		N	899	899	899	899
Amhara	Male	Mean	18.65	16.96	4.51	3.87
		N	685	685	685	685
	Female	Mean	7.12	7.95	3.83	2.72
		N	214	214	214	214
	Total	Mean	15.90	14.81	4.35	3.60
		N	899	899	899	899
Oromia	Male	Mean	26.35	13.35	2.01	1.95
		N	768	768	768	768
	Female	Mean	6.06	3.17	.00	.00
		N	134	134	134	134
	Total	Mean	23.34	11.84	1.72	1.66
		N	902	902	902	902
SNNP	Male	Mean	19.93	8.78	12.10	6.28
		N	748	748	748	748
	Female	Mean	13.44	7.27	11.35	7.34
		N	154	154	154	154
	Total	Mean	18.83	8.52	11.98	6.46
		N	902	902	902	902

* Length of Soil or Stone bunds constructed by or with the help of others but maintained/protected by the HH (GOs, NGOs, CBOs) to date and existing, in meters.

3.2.7. Investment in Perennial Crops

Households were asked about the number and types of tree crops that they have planted during the last two years before the survey. They reported about the fruit, non-fruit and indigenous tree that were planted and the number that survived (nine months and above) (Table 18). In all regions, more commonly planted trees are non-fruit trees while the indigenous trees are also common in Tigray and Amahra, but less in Oromia and SNNPR. This may mean that as deforestation of indigenous trees have been intense in the two regions in the past, effort is being made in some rehabilitation of the indigenous tree specious.

Compared to male headed, female headed households plant less number of non-fruit trees. On the other hand, interestingly, women- headed households planted by far more number of fruit trees than the male headed households. This may imply that garden crops like fruit trees are important for the household economy of women headed households.

Table 18: Number of surviving (i.e., NINE months plus) trees planted during the last 24 calendar months by Sex of Household Heads

Regional State	Sex of interviewee		Number of NON-FRUIT trees (No)	FRUIT trees (No)	INDEGENO US trees (no)
Tigray	Male	Mean	22.19	5.79	23.18
		N	703.00	703.00	703.00
		Std. Deviation	63.73	17.08	101.10
	Female	Mean	12.32	8.72	26.38
		N	196.00	196.00	196.00
		Std. Deviation	31.48	35.16	93.22
	Total	Mean	20.04	6.43	23.88
		N	899.00	899.00	899.00
		Std. Deviation	58.37	22.32	99.39
Amhara	Male	Mean	89.28	7.21	28.04
		N	685.00	685.00	685.00
		Std. Deviation	409.63	42.25	228.36
	Female	Mean	28.95	15.42	6.07
		N	214.00	214.00	214.00
		Std. Deviation	183.01	165.49	56.38
	Total	Mean	74.92	9.16	22.81
		N	899.00	899.00	899.00
		Std. Deviation	369.35	88.70	201.40
Oromia	Male	Mean	176.28	8.24	13.15
		N	768.00	768.00	768.00
		Std. Deviation	1315.07	44.58	184.38
	Female	Mean	23.19	2.89	6.93
		N	134.00	134.00	134.00
		Std. Deviation	124.57	13.83	69.58
	Total	Mean	153.54	7.45	12.22
		N	902.00	902.00	902.00
		Std. Deviation	1215.51	41.52	172.22
SNNP	Male	Mean	81.10	10.70	6.24
		N	748.00	748.00	748.00
		Std. Deviation	334.45	40.61	42.01
	Female	Mean	27.86	8.05	2.70
		N	154.00	154.00	154.00
		Std. Deviation	61.57	24.35	9.04
	Total	Mean	72.01	10.25	5.64
		N	902.00	902.00	902.00
		Std. Deviation	306.24	38.32	38.45

Cultivation of Coffee, Chat and Enset crops is important for the farm households. These crops are very common in Oromia and SNNPR while they are very much limited in Tigray due to ecological conditions. There are some coffee, chat and esnet crops in Amhara region (Table 19). Cultivation of these cash crops shows a marked

difference between female and male households as seen from the average number of planted crops. The number is higher for male headed- than female headed households.

Table 19: Number of Coffee, Chat and Enset plants planted during the last 24 calendar months by Sex of Household Heads

Regional State	Sex of HH Heads		Number of coffee plants planted during the last 24 calendar months	Number of chat plant planted during the last 24 calendar months	Number of enset plants planted during the last 24 calendar months
Tigray	Male	Mean	.47	.69	.01
		N	703	703	703
		Std. Deviation	3.680	11.647	.141
	Female	Mean	.14	.56	.00
		N	196	196	196
		Std. Deviation	.728	5.806	.000
	Total	Mean	.40	.67	.01
		N	899	899	899
		Std. Deviation	3.274	10.647	.125
Amhara	Male	Mean	15.17	42.49	.29
		N	685	685	685
		Std. Deviation	116.193	298.562	2.660
	Female	Mean	3.77	.81	.08
		N	214	214	214
		Std. Deviation	28.902	7.160	1.034
	Total	Mean	12.46	32.57	.24
		N	899	899	899
		Std. Deviation	102.495	261.198	2.377
Oromia	Male	Mean	249.89	137.32	165.49
		N	768	768	768
		Std. Deviation	749.265	765.583	688.322
	Female	Mean	33.46	22.55	13.06
		N	134	134	134
		Std. Deviation	102.741	163.434	38.975
	Total	Mean	217.74	120.27	142.84
		N	902	902	902
		Std. Deviation	696.703	710.323	637.566
SNNP	Male	Mean	22.53	206.84	176.01
		N	748	748	748
		Std. Deviation	72.179	768.688	458.625
	Female	Mean	12.08	164.86	115.79
		N	154	154	154
		Std. Deviation	20.461	622.878	230.394
	Total	Mean	20.75	199.67	165.73
		N	902	902	902
		Std. Deviation	66.377	745.667	428.852

3.2.8. Mobility of Labour

Enquiry was made whether household members have left home permanently or temporarily during the last two years. The response shows that household members have left home on both temporary and permanent basis. The degree of mobility varies from region to region (Table 20). More households in Amhara than Tigray have experienced permanent mobility of household members. Similarly, the SNNPR has more household whose members have left home permanently than Oromia. The data shows that 7% of Households interviewed in Tigray, 17% in Amhara, 10% in Oromia and 14% in SNNPR had some members of their household permanently left home. Analysis of this household behavior in relation to the current land holding does not show a clear relation of permanent mobility with size of holding. Some other reasons of livelihood motivation must have been behind permanent migration of household members.

Table 20: If Any Household Member Has Left Home for Good (PERMANENTLY) During the Last 24 Calendar Months

Regional State			Frequency	Percent
Tigray	Valid	Yes	65	7.2
		No	830	92.3
		Total	895	99.6
	Missing	System	4	.4
	Total		899	100.0
Amhara	Valid	Yes	155	17.2
		No	741	82.4
		Total	896	99.7
	Missing	System	3	.3
	Total		899	100.0
Oromia	Valid	Yes	89	9.9
		No	812	89.9
		Total	901	99.8
	Missing	System	2	.2
	Total		903	100.0
SNNP	Valid	Yes	129	14.3
		No	771	85.5
		Total	900	99.8
	Missing	System	2	.2
	Total		902	100.0

On the other hand, temporarily migration of household members to other places out of home is less prevalent compared to leaving home for good . Only 3% , 7%, 2% and 4% of the households in Tigary, Amhara, Oromia and SNNPR have reported to have experience of temporary migration of their members (Table 21). There is no clear relationship between the size of current land holding owned and temporary migration of household members.

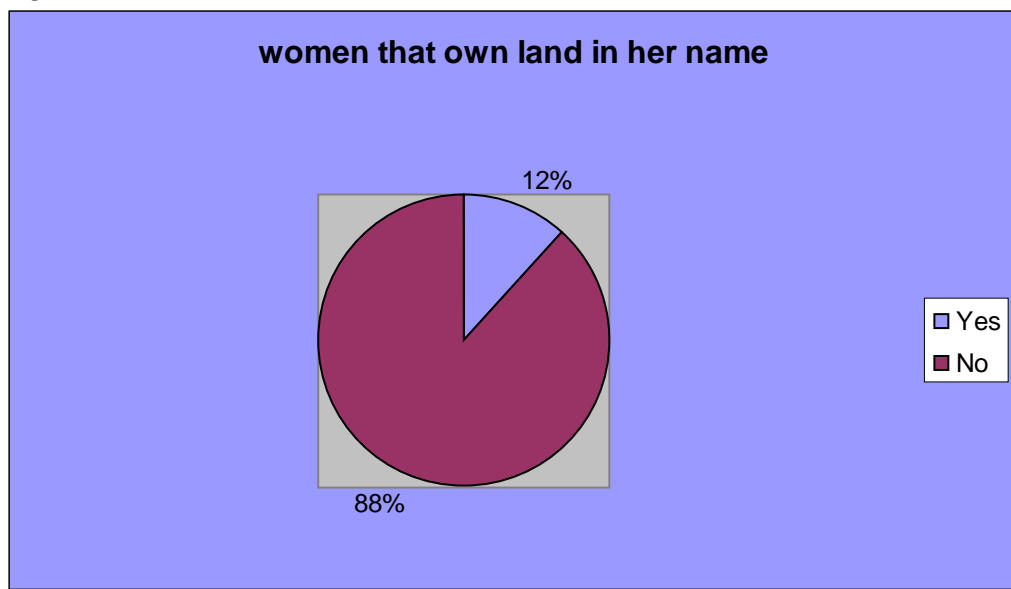
Table 21: If Any Household Member Has Ever Left Home TEMPORARILY (for more than 3 days and nights) in Search of Work During the Last 24 Calendar Months

Regional State			Frequency	Percent
Tigray	Valid	Yes	23	2.6
		No	854	95.0
		Total	877	97.6
	Missing	System	22	2.4
	Total		899	100.0
Amhara	Valid	Yes	64	7.1
		No	820	91.2
		Total	884	98.3
	Missing	System	15	1.7
	Total		899	100.0
Oromia	Valid	Yes	19	2.1
		No	870	96.3
		Total	889	98.4
	Missing	System	14	1.6
	Total		903	100.0
SNNP	Valid	Yes	32	3.5
		No	859	95.2
		Total	891	98.8
	Missing	System	11	1.2
	Total		902	100.0

3.3. Gender Component

3.3.1. Women land Possession Right and land certification

Figure 3: The number of women that own land in their name



Over all women who possess land in her name accounts for 12% in all regions. However detail analysis of women personal land holding status in the different regions shows that more women in Amhara and Tigray region hold their own personal land. The below table shows women personal land holding status in the four regions disaggregated by wife number 1 and 2

Table 22: Wife Possesses Land in Her Name disaggregated by wife No. 1 and 2 and Region

Region	Wife #1 Percent	Wife #2 Percent
Amhara	24.8	0
Oromia	5.1	6.1
SNNPR	1.7	9.8
Tigray	16.4	0

As stated in the above table about 25% of interviewed wife number 1 in Amhara and 16% in Tigray claimed to possess land in their name. Out of this 50.4% holds certificate of title for the plot of land she says she possess in her name , and 9.2 % has a certificate for the household , 3.1 % is expecting to receive certificate of her own while 37.2 % have no certificate yet.

Out of Interviewed Wife # 2, 6.1 % in Oromia region and 9.8% in SNNPR region claimed to possess Land in Her Name of which 14.% in Oromia and 20% in SNNPR holds a certificate of title for the plot they possess. Another 40% in SNNPR is expecting to receive their certificate

Table 23: percentage of polygamous family per region

Region	Percent
Amhara	1.2
Oromia	15.6
SNNPR	8.1
Tigray	0.2

With regard to the land possession and certification status in the Polygamous family, the overall the survey result indicates that about 5.7 % of interviewed HH are polygamous family. However further analysis of the finding by the region shows that polygamous family is more prevalent in Oromia followed by SNNPR. The survey has tried to find out further how the land certification process was handled in the polygamous and monogamous family as elaborated in the below table.

Table 24: How certificate was issued to family

Type of certificate	Wife#1	Wife#2
Certificate issued jointly to both spouses	63 .1	25
Each spouse possess separate certificate for different plots	24.8	50
I do not know the form in which it is issued	4.1	25
Others	8.1	

As we can see from the table the majority of families had registered their land under joint titling, though in the polygamous families the majority of the spouse have possess separate certificate for different plots. On the other hand significant number of women in polygamous family does not know how the certificate was issued.

Table 25: How the Joint Nature of Certificate of Title is confirmed

Modality	Wife#1	Wife#2
Both spouse name and pictures are on the certificate	37.5	50
only the name of both spouse stated on the certificate	14.8	7.1
certificate issued to the HH and spouse name included ...	7.8	14. 3
Only husband's name is there	39.9	28.6

3.3.2. Women decision making power on land use

On the previous chapter we have tried to see the existing experience on women access to land and how this access to land right has been confirmed. This unit presents the gender aspect of land control.

Table 26: **Who Decides on What Crops to grow on the Land**

Decision made by	Percent
I myself	3.9
My husband	24.9
I and my husband decide together	71.3
Total	100.0

One can see from the above table decision on how to use the land is made jointly by husband and wife in the majority of the HH, though still in about a quarter of interviewed HH husband alone make decision on the land use.

Table 27: If Interviewed Wife #1 Makes the Decision to Rent-out/Sharecrop-out the Land by Herself

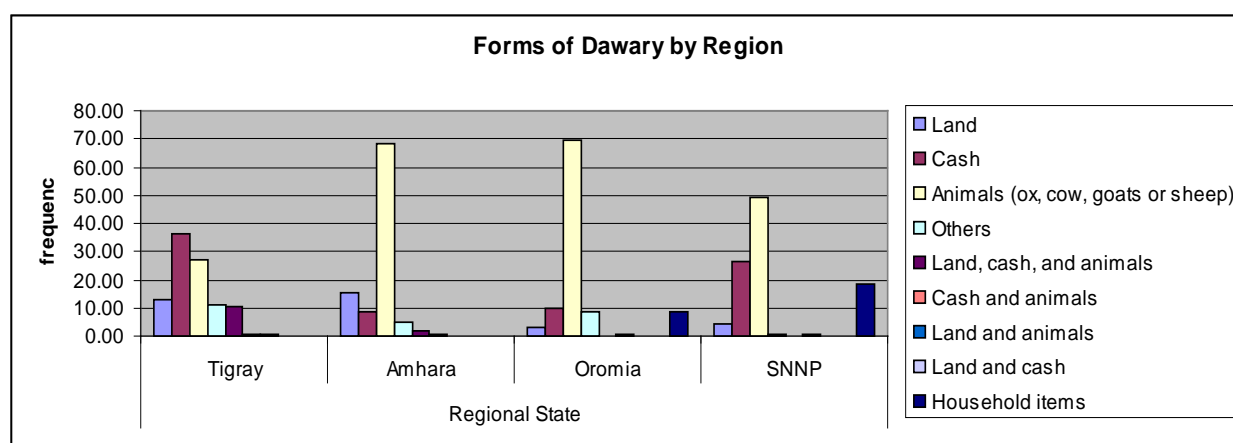
Regional State	Yes	NO
Tigray	50.0	50.0
Amhara	42.5	57.5
Oromia	59.1	40.9
SNNP	75.0	25.0

Although it is naturally expected that decision to Rent-out/Sharecrop-out the land could be made jointly the finding shows that more women in Oromia and SNNPR claimed to make decision by herself. It is worse to investigate here whether this is due to practice of polygamous family or some other reason.

3.3.3. Current practice of land division among HH in case of divorce and inheritance

In order to find out whether or not women contribute any property during marriage and how this could possibly be influencing the property division, especially land, during divorce and inheritance the respondent were asked whether or not there exists a practice of women bringing dowry to marriage. The current practice shows that about 42.6% of the respondent says yes women brings dower to marriage.

Figure 4: Forms of Dowry Women Bring to Marriage



The most common forms of dowry women brings to marriage includes, animal about 47.6%, cash 24.7% and land 9.5%. The practice of bringing land in the form of dowry is more practiced in Amhara (16%) followed by Tigray (13%).

Table 28: Current practice on land division in the case of divorce

Current Practice	%
Spouse share the land by dividing it equally	68.8
Husband retains all the land under the HH possession	8.1
Each spouse takes only the plot it contributed upon marriage	7.3
Wife retains all the plots under the HH possession	7.1
I do not know/have no experience about it	10.5
It is given to the spouse with whom the children stay	0.2

The above table shows that, despite who contributes what to marriage the current practice shows that in case of divorce both spouse share the land equally in most cases. There also exists an experience that husband retains all the land in some places; while similarly in another places wife's retain all the land.

Table 29: Current Practice on Land Division in the Case of Inheritance

Current Practice	Percentage
Wife and children inherit the land	75.2%
Wife inherits all the land	10.5%
Children divide up the land equally among themselves	8.7%
Only male children inherit the land	2.6%
Relatives of the diseased inherit the land	2.4%
Don't know	0.1%

3.3.4. Gender related land dispute

For women most of the case of land related dispute is caused by conflicting land claims following divorce accounting for (47.5%) of the cases, and conflicting land claims following inheritance accounting for (21.3 %). while conflicts resulting from boundary encroachment (16.6 %), sharecropping and rental matters (5.6 %) and disagreement arising from marriage of a second wife (0.4%) relatively lower than the conflict related to divorce and inheritance cases.

Table 30: Factors that Contribute to Dispute Over Land in the Past, by regions

Factors	Regional State				Total
	Tigray	Amhara	Oromia	SNNP	
Lack of land title certificate/legal	203	87	91	117	498
Unfair land redistribution	74	108	233	102	517
Husband's refusal to accept his wife's equal right to land	82	154	142	110	488
Community's refusal to accept women equal right to land	37	38	47	106	228
1 and 2	70	26	26	59	181
1, 2, 3	106	164	2	151	423
2 and 3	17	6	13	2	38
3 and 4	37	28	9	52	126
1 and 3	30	16	29	1	76
conflict because of inheritance		2	4		6
boundary conflict	1	1	71		73
I do not know	14	8	26	4	52
	671	638	693	704	2706

Table 31: If Interviewed Wife #1² has Ever been involved in any kind of land dispute in the past two years

Regional State	Tigray	Amhara	Oromia	SNNP
Yes	4.6	8.2	6.5	4.5
No	95.4	91.8	93.5	95.5
Total	100.0	100.0	100.0	100.0

Table 32: If Interviewed Wife #2 has Ever been involved in any kind of land dispute in the past two years

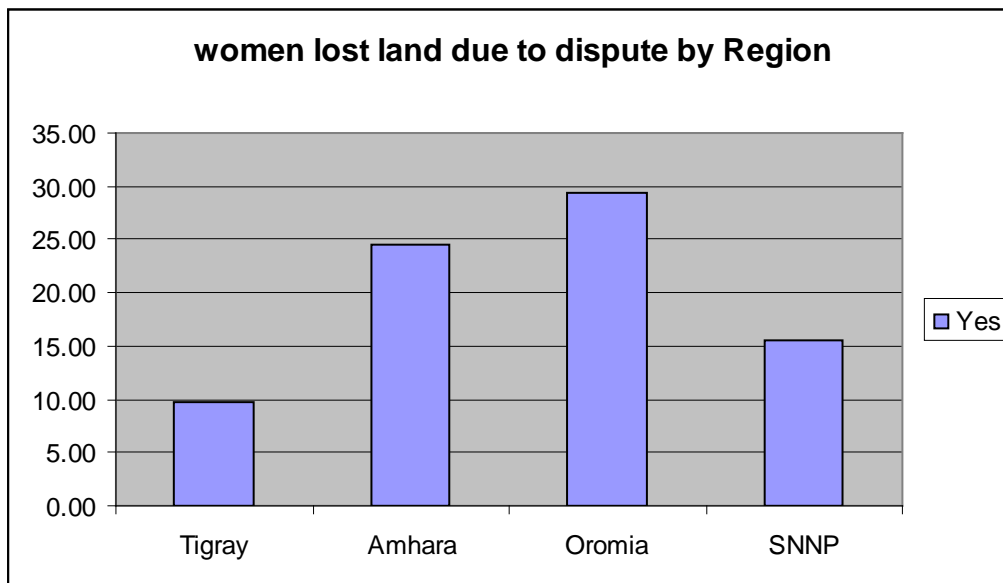
	Tigray	Amhara	Oromia	Valid SNNP Percent
Yes			3.0	2.5
No	100	100	97.0	97.5
Total	100.0	100.0	100.0	100.0

² Note : wife # 2 refers to a second wife in a polygamy household

Table 33: If Interviewed Wife #1 Has Lost Land Due to Any Kind of Land Dispute She Has Ever Been Involved In

Regional State				
	Tigray	Amhara	Oromia	SNNP
Yes	9.68	24.53	29.31	15.63
No	61.29	66.04	60.34	81.25
issue still going on	29.03	9.43	10.34	3.13
Total	100.00	100.00	100.00	100.00

Figure 5: Women who lost land to dispute by Region



3.3.5. Women Participation on Land Registration Process

Only 31.2% of the interviewed women participated on the kebele meeting that discussed on process of land registration, 57% did not participate while 11.8% has no any idea about the process.

Table 34: Level of consultation of women during the registration process

Yes I was present and consulted	28%
Yes I was present but not consulted	25.5%
No I was not there	32.4%
Land is not yet measured	14.2%

As observed from the above table women participation on the land certification process was weak. Only 28% of the women were consulted during the certification process despite their presence in the area.

3.3.6. Women's knowledge regarding Land Law

There is a significant level of awareness of land law, though still the majority either do not understand them or don't completely know about the law. The survey result shows that about 38% of the respondent said they know and understand them, 16.3% know but do not understand them, 16.8% know very little, while 28.5 have no idea of the land laws.

3.3.7. Perception Regarding the Effect of Land Registration and Title Certification on women

The most common effect women expect from land registration is that it will enhance women's bargaining power within the household. Some 30% of interviewed women have no idea about how its effect while 11% say it will bring economic independence for women. There are other like 13.4% who believe that it will have no effect on women at all.

Table 35: **Perception Regarding the Effect of Land Registration and Title Certification on women**

Perception	Percentage
It will enhance women's bargaining power within the household	46%
It will have no effect on women	13.4 %
It could bring economic independence to women	10.8%
I do not know about its effect yet	29.7%

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Annex

(Annex is provided in A separate file)

**Ethiopian Economics Association/Ethiopian Economic
Policy Research Institute**

**A Final Baseline Survey Report on
Ethiopia: Strengthening Land Administration Program
(ELAP)**

Submitted to: Tetra Tech ARD

**April, 2013
Addis Ababa**

Acknowledgment

Ethiopian Economics Association / Ethiopian Policy Research Institute and its Research Team that implemented this baseline survey project would like to appreciate and value the contributions of all organizations and individuals towards the accomplishment of this important task. Our utmost appreciation goes to Tetra Tech ARD, ELAP coordination unit for their interest to work with EEA/EEPRI. Special thanks go to Dr. Solomon Bekure and Dr. Michel Roth who were instrumental to bring this important project to the attention of EEA/EEPRI. Dr. Solomon also deserves our heartfelt thanks for his continuous support and encouragement during the course of the study and comments on the initial draft. The comments of Ms. Karol Boudreaux and Ato Zemen Haddis were quite useful for us to improve the report; thank you very much. We are grateful to the staff of the office of agriculture of the sample woredas namely: Jeju, Dugda, Wenberima, Wendogenet, Alaba, Raya Azebo and Tahtay Adiabo woredas for their genuine supports during the fieldwork. We gained a lot of support from kebele administrations during the fieldwork. Without their genuine and tireless support the fieldwork would have not been completed in time. Thus, we would like to extend our thanks to them. The EEA/EEPRI field survey workers have done a tremendous job in undertaking this demanding task and, hence, they deserve our appreciation too. The logistic and administrative support of all EEA/EEPRI staff has been very useful for the accomplishment of the project. Special thanks to Mr. Daniel Aklilu for his very good job in preparation of the database. Finally, our great thanks are due to the farmers (men and women) for their willingness and devotion of their precious time to respond to our interview questions, to participate in focus group discussions and key informant interviews. We hope that this kind of effort will help in improving their rights to land and welfare of their households in the future.

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Executive Summary

Land certification programs have been implemented in several African countries as a measure of improving tenure security of smallholder farmers. In Ethiopia, such programs were implemented in four major regions (Amhara, Oromia, SNNP, and Tigray) in the past decade with financial and technical support from some donors. USAID is one of the donors involved in nation-wide land certification program in Ethiopia. The notable example of donor supported program is “Ethiopia, Strengthening Land Administration Program” (ELAP) which began in August 2008 and is anticipated to be completed in January 2013. The program was implemented in six regions of Ethiopia namely: Amhara, Afar, Oromia, SNNP, Somali and Tigray. The overall objective of ELAP is to assist the Government of Ethiopia to strengthen and enhance rural land tenure security and administration. This study was initiated to generate qualitative and quantitative data which will be analyzed to understand the economic and social impacts of land certification and registration programs which have been implemented in areas of high investment potential¹ in target regions of ELAP.

We used several approaches in the study that include household survey, focused group discussions and key informant interviews. Seven ELAP *woredas* were covered by the study. More than 950 randomly selected households residing in 25 *kebeles* were interviewed by using a structured questionnaire. Both husbands and wives were interviewed in each household using separate questionnaire which makes the total number of interviews about 1900. Moreover, about two key informant interviews and two focus group discussions were held in each of the target *kebele* to collect data that supplement the quantitative data. The field work was conducted in April and May 2012.

The results indicated that all of the sample respondents engage in agriculture as a primary economic activity. Land for agriculture is acquired through various means in the study areas. About 57% of the parcels have been acquired from *kebele* administration whereas the remaining parcels have been acquired through other means including inheritance. The mean total land holding of the sample households is 1.83 ha. It varies from 1.37ha in Tigray to 2.48 ha in Oromia. About 82% of the land is used for annual crop production.

¹ 'high investment potential areas' means those areas well endowed with fertile soils and good rainfall regimes and, therefore, highly productive that induce investment in land by both smallholder and commercial farmers.

Nearly 90% of the sample households have got either first-level or second-level certificate. First-level certificates have been given to households in all regions whereas second-level certificates are missing in the sample *woreda* of Amhara region (i.e. Wenberima *woreda*). The majority of the certificates have been issued by the name of husband and wife. However, about 16% of the certificates have been issued by the name of husbands alone while independent certificates to wives in the presence husbands are rare (i.e. 0.9%).

Almost all of the respondents believe that having a certificate of possession is a guarantee of secured hold over one's land. Most of the respondents (98.8%) believe that they would stand to benefit in the future from whatever soil and/or water conservation measures that they may practice on their land. However, households who feel that it would be risky to rent/share out their lands even for one season are substantial in number (31.8%).

Informal land rental transactions are common in the study areas. Relatively high degree of participation was found among holders of land certificate (first-level and second-level certificates) as compared to non-holders. The selection of tenants by landlords also varies between holders of land certificates and non-holders. Most of the households without land certificate rented-out their land either to their relatives (52.6%) or to their friends (21.1%). On the contrary, 45.1% of the second-level certificate holders and 35.5% of the first-level certificate holders made agreements with tenants who are outside of their kinship structure as well as their friendship circles.

Soil conservation measures have been practiced in all of the study regions. About 36% of the sample households have constructed soil conservation structures such as soil bunds, stone bunds, hedgerows, soil ditches, vegetation lines, and grass strips using their own resources. In terms of the percentage of households who allocated resources to construct soil conservation structures, households with second-level certificates are visibly better than those with first-level certificate and those with no certificate while there is no visible difference between the latter two categories of households.

The participation of households in all water conservation techniques (such as on-farm water retention and water harvesting) is low. There are significant differences among first-level

certificate holders, second-level certificate holders, and non-certificate holders with regards to percent of households who allocated resources for agricultural water development. First-level certificate holders takes the lead with regards to on-farm water retention structures and hand-dug well whereas second-level certificate holders takes the lead with regards to water harvesting. Moreover, the difference among the four regions is significant; Amhara region takes the lead and Oromia takes the least position.

More than one-third of the sample households plant perennial crops of any kind. On average, about 42 seedlings have survived per household. The survival rate was about 16%. The majority of these (about 41 of them) are seedlings of non-fruit crops or trees. In contrast to the expectation larger percentage of households without land certificate have planted more perennial crops than those with certificates of any kind.

Nearly three-quarters of the sample households use chemical fertilizers (DAP and Urea) to produce crops. The percentage of farmers using organic fertilizers is also high (i.e. 61.7%). Regional variations are significant with regards to the use of both types of fertilizers; Amhara takes the lead with regards to chemical fertilizers and SNNPR leads with regards to organic fertilizers. However, there is no significant difference between first-level certificate holders, second-level certificate holders, and those without certificate with regards to the percentage of households using these inputs. Improved seeds are used by about 46% of the sample households. The rate of use of improved seeds is high as compared to the national figure (i.e. 14.7% in 2011) (CSA 2011a, CSA 2011b).

The average land productivity is 19,077 birr/ha whereas the average labor productivity is about 11,000 birr per adult equivalent. Significant variation exist among regions and status of land certification while the average land productivity is, by and large, uniform across regions and certification status.

About 17% of the sample households involved in at least one land related dispute within two years before the survey time. The most common cause of dispute is boundary encroachment (58.8%). Land related disputes are relatively high in Amhara and Tigray and low in SNNPR and

Oromia. Disputes are relatively high among holders of first-level certificates as compared to the other groups. Disputes are commonly resolved through elders' councils whereas formal mechanisms are rarely used.

The majority of women possess land. The percentage of first wives who possess land in their names is by far higher than that of second wives in polygamous families. More than 90% of first wives and second wives have received certificates for their land. More number of women possess second-level certificate than first-level. This is actually the case for both first wives and second wives.

Women are adequately aware of the process of land certification i.e. about 79% of the first wives and about 81% of the second wives are informed about the process. Although, women's awareness about the process is generally high, their participation on formal discussions about the issue is very low. Only 33% of the first wives and 38.9% of the second wives participated in meetings arranged to discuss about the process.

The great majority of the first wives (93.6%) and second wives (89.9%) feel better secured of their land possession after the registration program. About 58% of first wives and 61% of second wives believe that the program would have positive impacts on women since it enhances women's bargaining power within the household and increases their economic independence.

Landholding varies between male-headed households and female-headed households. In this regard, the average land holding of female-headed households is significantly smaller than male-headed households.

Female headed households were compared to male-headed households with respect to selected variables. The purpose here is to shade light on the differences between male and female farmers taken as heads of households but not as husbands and wives. These include awareness and understanding of land laws and rights, involvement in informal land markets, involvement in natural resource management, involvement in land related disputes, and use of farm inputs.

With regards to awareness on existing land rights and obligations and understanding of land laws female-headed households take significantly lower position as compared to male-headed ones.

This indicates that male household heads have better access to information on land laws as compared to their female counter parts.

Both female-headed and male-headed households involve in land rental markets though the way they involve is different. In this regard, female-headed households participate in informal land markets mostly as land suppliers while male-headed households are active both demand and supply sides.

The two groups were compared to each other with respect to their participation in on-farm natural resource management i.e. soil conservation, water management and planting of perennial crops. Female-headed households are significantly lower than male-headed ones in terms of percent of household who protect soil conservation structure constructed on their farms with the help of others, percent of households who allocated own resources to construct on-farm water harvesting canals, and rate of participation in tree planting.

Female-headed households are on the lower side in terms percentage of people who use chemical fertilizers, organic fertilizers, and improved seeds as compared to male-headed households. However, their average rate of application is similar to that of male-headed households.

1. Introduction

1.1. Background and Rationale

Land is a basic resource for rural livelihoods. This is quite visible in most developing countries of Africa, Asia and Latin America where large number of people depend on agriculture to get access to food and generate income. Thus, land policies and program interventions that disturb existing land tenure in one way or another will have direct and substantial impacts on rural livelihoods. Such a strong connection of land with rural livelihoods makes the issue of rural land politically the most sensitive issue in developing countries (Deininger, 2003)

Improved land tenure security encourages farmers to increase their investment in land resulting in sustainable land management, increased productivity, better income, and, in general, better rural livelihoods (Deininger, et al 2009). It is also expected to facilitate land related transactions (i.e. land use right rentals sharecropping) and reduce land disputes and conflicts (Holden, et al n.d). More economic and social impacts of tenure security have been reported in several studies. The positive impacts of more secure land tenure on investment, land markets, women empowerment, and land conflicts in rural areas have been demonstrated in East Asia (Jacoby et al. 2002), Latin America (Bandiera 2007), Eastern Europe (Rozelle and Swinnen 2004), and Africa (Deininger and Jin 2006, Deininger, et al 2009, Holden and Tefera 2008, Holden, et al n.d).

Tenure security can be strengthened through legal reforms, developing regularized land survey and certification systems, strengthening public awareness through media campaigns, and implementing land certification programs. Land certification programs have been implemented in several African countries as a measure of improving tenure security of smallholder farmers.

In Ethiopia, land certification programs were implemented in four regions in the past decade namely Amhara, Oromia, SNNP, and Tigray. All of these regional governments have their own laws and implementing regulations and that these vary in some respects from region to region. The federal land law provides a framework for regional land laws. While these regions carried

out land adjudication and first level² landholding certification with their own resources, they piloted second level certification with technical and financial support of a project called “Ethiopia – Land Tenure and Administration Program” (ELTAP). ELTAP was a three-year program implemented by the Federal Ministry of Agriculture and Rural Development in collaboration with the four Regional States from July 2005 through June 2008 with funding from USAID. The objective of this program was to assist the Government of Ethiopia (GOE) to implement a sound land registration and certification system that provides holders of land use rights in Ethiopia with robust and enforceable tenure security in land and related natural resources.

The ELTAP project was succeeded by another program known as “Ethiopia, Strengthening Land Administration Program” (ELAP) which began in August 2008 and is anticipated to be completed in February 2013. ELAP is a five-year program (2008-2013) designed to strengthen land registration and certification activities implemented in four regions (Amhara, Oromia, SNNP and Tigray) and to expand the effort to other regions (e.g. Afar and Somali regions). It is comprised of four components:

Component 1: Strengthening the legal framework on land administration;

Component 2: Promoting tenure security to enhance land investment in high potential areas;

Component 3: Increasing public information and awareness; and

Component 4: Building the capacity of land administration institutions.

Similar to ELTAP, the overall objective of ELAP is to assist the Government of Ethiopia to strengthen and enhance rural land tenure security and administration by improving the legal framework; advancing public awareness of land rights and the major provisions of land administration and land-use laws; and promoting investment in land through improved land administration legislation and certification. The primary purpose of ELAP in the four regions is to enhance investment on rural lands through effecting second level land certification and strengthening the Land Administration Offices of selected *woredas* to improve the efficiency and effectiveness of land transactions that may occur among various stakeholders such as farmers,

² Second level land holding certification involves measuring the land with Total Station or handheld GPS and issuing to landholders geo-referenced parcel maps with area measurements. First level landholding certificates do not include parcel maps. The areas recorded for the parcels are rough estimates.

investors, and development program implementing agencies. But unlike ELTAP, the ELAP pilots are situated in high investment³ *woredas* and *kebeles*.

These programs are expected to produce positive impacts on the livelihoods of the rural people by promoting investments on land, reducing land related disputes and conflicts, empowering women, and, in general, by enhancing sustainable use of land and embedded resources. Measuring the impacts of these development programs and the changes that occurred overtime is quite essential in order to better inform program implementation and formulation of federal and regional land administration policies.

1.2. Objectives

The overall objective of this project is to generate qualitative and quantitative data which will be analyzed to understand the economic and social impacts of land certification and registration programs which were implemented in areas of high investment potential in four regions of Ethiopia (i.e. Amhara, Oromia, SNNP, and Tigray). Specifically the study aims to:

- establish ELAP baseline data which will complement the second round survey to analyze the impacts of second level land certificates in selected high potential areas of Amhara, Oromia, SNNP, and Tigray regions.
- prepare a report based on an initial analysis of the data, including an analysis of investment decisions, land use, perceptions of tenure security, land related disputes, and women positions vis-à-vis land rights

2. Literature Review

2.1. Land certification/titling and tenure security

Security is a mental reaction to external phenomena and tenure security is largely dependent on the right holder's own perception of risk in relation to the asset in question. In fact, right holders always evaluate the status of their rights with respect to the situation of the duty bearers and the third party rule enforcers. First, right holders might feel better secured if they perceive that duty bearers have internalized their duties and are devoted to honor the rights of others i.e. when they

³ 'high investment potential areas' means those areas well endowed with fertile soils and good rainfall regimes and, therefore, highly productive that induce investment in land by both smallholder and commercial farmers.

perceive second party enforcements are functional. Second, and more importantly, what makes right holders more comfortable about their rights is their trust in third-party rule enforcers which can be the state or customary authorities.

While land certification brings the state to the front line as a third party-rule enforcer, its effectiveness depends on how much customary authorities are capable to protect the rights of right holders. Where farmers consider customary institutions as legitimate enforcers of land rights and are confident about the capacities of such institutions in enforcing rights, land registration may not have visible impacts on tenure security and the resulting benefits. Some authors argue that in many rural areas, customary rights provided by local authorities, or farmer's acquisition of informal land documents, might be sufficient to provide them with the required tenure security (Migot Adholla 1991, Platteau 1992). In such situations farmers would be less interested in registering their lands, and even if they accept it at the beginning of the intervention they would abandon it sooner or later. For instance, in Cameroon, where land can be registered under the 1974 Land Ordinance, very few plots in rural areas have been registered. Many farmers have initiated the procedure and abandoned it after the boundary demarcation phase (Firmin-Sellers and Sellers 1999). While demarcation, per se, has no force of law, village communities saw it as increasing tenure security, since other villagers were unlikely to contest land rights that had received that level of official recognition (Firmin-Sellers and Sellers 1999, Toulmin 2008).

On the other hand, in areas where customary institutions are weak or absent the intervention of the state through land registration programs may get positive and quick responses from peasant households and the effectiveness of formal land registration programs may be high. For instance, in rural highland of Ethiopia, where customary institutions are weak in protecting land rights, the demand for government initiated land registration was very high and the program has been praised by several writers for its effectiveness in reducing land related disputes, empowering women, and reducing poverty (Deininger et al 2007, Holden and Teferra 2008, Holden, et al n.d, Holden and Ghebru 2011).

Frequent land redistribution and expropriations for commercial reasons are interventions that reduce tenure security. Even if they are vibrant, customary institutions may not have the legitimacy and capacity to protect local right holders against such interventions which creates a sense of insecurity among right holders. A study by Deininger, et al (2007) indicate that smallholders were eager to get their certificates quickly so as to be able to use them in court and thus bolster the case for getting compensation. Furthermore, the impact of land registration on tenure security depends on how “impartially” customary institutions protect rights. For instance, in areas where the possibility of acquiring “stronger” informal documents is related to wealth characteristics of farmers, certification might have a justification not only from an efficiency point of view but also from an equity perspective (Fort 2008).

Such specificities among counties and localities resulted in different impacts of land certification programs on tenure security. In the Ethiopian highlands, where customary institutions are weak to enforce rights, land registration programs have contributed to increased perceptions of tenure security for both women and men (Holden and Tefera 2008). Holders of titled land in an irrigation scheme in Somalia felt more secure and their land had higher value than those with legally unrecognized customary tenure (Roth, et al. 1994). Similarly, studies in Latin American counties (e.g. in Guatemala and Honduras) indicate that titling has improved tenure security (Pagiola 1999, Stanfield 1990). On the contrary, Feder *et al.* (1988) note that the highly successful and lauded case of rural land titling in Thailand brought a relatively minor benefit for Thai farmers who already had fairly secure tenure arrangements under customary law.

2.2.Impact on Investment on land management

The primary characteristic of land rights is their ability to influence investment decisions particularly on land management practices. The strength and size of the effect of land rights on investment depends on the attractiveness of investment opportunities and the efficacy of enforcement (Deininger et al 2009). Studies provide a number of positive links between land rights and investment incentives (Besley 1995, Dzanku 2008, Twerefou, et al 2011). The first link captures the positive relationship between tenure security and investment incentives. The second emphasizes the use of land as collateral to obtain credit, if the individual has secure rights over the land, a situation that has the potential of promoting investments. Third, transfer rights

affect investment incentives. Besley (1995) has identified three channels through which higher security and better enforcement of property rights can, in principle, affect economic outcomes. First, clearly defined property rights to land and the ability to draw on the state's enforcement capacity will lower the risks of squatters and eviction, increase incentives for land-related investment, and reduce the need for land owners to expend resources to stake out or defend their claims. The latter can be especially important to groups, e.g., women and the traditional discrimination against them owning land (Besley 1995, Joireman 2008). Second, secured property rights that permit the use of land as collateral may enhance investment by increasing access to credit. Third, better property rights may lead to expanded trading opportunities by lowering the costs of exchange if the land is either rented or sold.

A number of studies have focused on the effect of land rights on investment in land improvements, particularly in developing countries (e.g. Place and Swallow 2000, Besley 1995, Brasselle 2002, Udry 2002). As often is the case when different methodologies are applied to similar issues, the results are often mixed and, in general, there is no consensus on the impact of land rights and tenure security on investment. There are, however, two general conclusions that emerge from the empirical literature with regards to land rights and investments on land. First, investments in land improvement and conservation do not require a systematic arrangement of land rights through such policies as land titling. In studies such as Place and Hazell (1993) where tenure security is defined in terms of bundles of transfer rights or possession of title, a weak correlation has been identified between tenure security and investment. Second, a number of studies argue in favor of privatization because of weak indigenous tenure security and property rights institutions and by lack of title that will allow land users to obtain credit for investment (Dzanku 2008). Similar to this conclusion, Gebremedhin and Swinton (2003) and others suggest that highly individualized rights are more important for long-term investment than for investments that are short-term in nature. This implies that the nature and type of investment is critical determinant of the effects of land rights and tenure security on investments⁴.

⁴ For instance, a person who have a right to use a parcel of land for a 6 month growing season may feel better secured to grow wheat or other annuals. He/she may not feel secured to plant coffee or other perennial as perennial require longer term entitlements to land. entitlement be secured , and if that person is safe from eviction during the season, the tenure is secure. Therefore, the effect of the rights on investment decisions can be

Empirical results in Ethiopia indicate that provision of land certificates to farmers *have* increased investment both at individual level and community level (Deininger, et al 2009, Gheberu and Holden 2008, Deininger, et al 2007, Deiniger, et al 2006). Most of them are on the performance of land certification program that have been expanded in four regions of Ethiopia namely Amhara, Tigray, Oromia, SNNP regions. Some of the survey highlights are that the farms which belong to the people without use certificates are less productive than those with certified plots (Ghebru and Holden 2008). This higher productivity among certified plots was the result of use of improved technologies (such as chemical fertilizers and improved seeds) on these plots as compared to the non-certified ones, but not because of the higher technical efficiency of the farmers while operating the certified plots implying that land certification can enhance use improved technologies though the mechanism of its effect on improved technologies is not clear from these literature.

Several other studies show that land certification programs in Ethiopia have induced better land management practices (e.g. tree planting, construction of stone terraces) which would ultimately mitigate the decline in land productivity observed in many parts of Ethiopia (Holden, et al, 2007, Deininger, et al 2009). According to Holden, et al (2007) land certification program has had a positive impact on investment in tree crops in Northern Ethiopia (Tigray region); it has also increased tree planting and tree seedlings on the plots. However, such a result doesn't hold for eucalyptus since farmers have been restricted to plant it on farmlands. Deininger, et al (2009) quantified the impacts of the certification program on investment in soil conservation structures. They found that the programs had an estimated average treatment effect of some 30 percentage points on the propensity to invest in soil and water conservation measures and more than double the number of hours spent on such activities. The impact of the soil conservation structures on output was estimated to be about 9 percentage points which is sufficient to cover program costs even under a conservative scenario.

Studies in other developing countries also show positive impacts of land titling (through its impacts on tenure security) on productivity. Alston, et al (1996) find that investments in land as well as land values are positively associated with the possession of formal titles in the Brazilian

influenced by the type of investment (e.g. planting annuals vs perennial crops) the farmer is planning to undertake on the land.

Amazon frontier. A study in Peru also shows that land titling has a positive but differentiated effect on investment, i.e. land titling has a stronger impact on investment in parcels with previously weaker levels of tenure security than on parcels with stronger security. Some studies in Asia corroborate the above finding (Fort 2008). For instance, a study in Vietnam shows that land titling induces households to undertake more long-term investments on their land (Do and Iyer 2008), i.e. farm households residing in a high registration province on average devote larger share of cultivated land to perennial, industrial, and fruit crops than those households who reside in a low-registration province. In Thailand, farmers use more fixed capital (56-250%), labor, draft power, and inputs (such as fertilizers and pesticides) on titled lands than untitled ones which has resulted in higher output and productivity (Feder, et al. 1988) while a study in China strongly supports the view that heightened expropriation risk puts a damper on investment as measured by use of organic fertilizers to improve soil fertility (Jacoby et al 2002).

However, the effect of land certification on soil conservation is not as direct as usually expected. According to Feder and Nishio (1998), there are prerequisite for land registration to be economically successful and a number of socio-economical issues should be considered in designing a successful land registration system (Feder and Nishio 1998). For example, in his study in Habru district of Amhara region in Ethiopia Tesfu (2011) found that the effect of land certification on land management depends on some other factors such as opportunities for non-farm income, availability of labor at household level, and education⁵. Feder, et al (1998) also observed a similar situation in Thailand where a high investment impact of land titling was facilitated by ready access to institutional finance and the existence of potentially profitable opportunities during the economic boom of Thailand (i.e. late 1980s and 1990s).

Several other studies show that the impact of land titling on investment is either insignificant or negative. A review by Braselle, et al (2002) shows that land titling had a very little effect on investment in a number of African countries. Gavian (1993) reported that tenure security had little effect on long-term investment in Niger because there were simply no opportunities for such investment, although it had a positive effect on manure application. A study by Migot-

⁵ Though not based on quantified impact results, Tesfu argues, for instance, that those households with members who can read and write can more easily understand and practice key messages of different brochures disseminated from various institutions.

Adholla *et al.* (1994) in Kenya also corroborates the study of Gavian; it reveals that land titling in Kenya did not lead to increased investment and productivity. These studies all predate the substantial economic growth in SSA as well as some important institutional changes presuming that in an institutionally weak environment land titling by itself would not spur much investment. Moreover, the effect of land certification depends of the situation on the ground before the program had been introduced i.e. land certifications may not result in increased investment and productivity if a secure land tenure had been realized earlier before the implementation of land certification programs⁶.

2.3. Impact on land transaction

Land certification programs are expected to have a positive impact on land markets. The expectation of positive impacts of land certification on land transactions arises from its potential impacts on tenure security. Those who want to rent in or buy land want to be certain that the renter/seller has the right to rent out or sell the land. Thus, in the presence of information asymmetries between land suppliers and demanders legal land certificates would serve as a source of information about the legal rights of land suppliers on plots of land. On the other hand, those who want to rent out land want to be certain that they would get back their land at the end of the contract period. In areas where tenure security is not assured people are mostly afraid of engaging in land transactions with others (particularly with people outside of their kinship) because of the risk of losing their land. Thus, land certificates can serve as a means to impose duties on the renters. By providing legal ground to impose duties on land demanders and providing information about land suppliers land certificates are expected to reduce transaction costs and hence enhance land transaction which in turn can facilitate better use of land (Toulmin 2008, Stanfield 1990).

However, existing empirical studies show mixed results of the impacts of land certification on land transactions. Deininger, et al (2009) found that land certification has increased the propensity to rent out land by 13 percentage points and the amount of land rented out by about 9

⁶ For instance, one may partly associate the positive impacts of the massive land certification program in Ethiopia on tenure security to the highly insecure land tenure arising from frequent land redistribution during the Derg regime and in the early years of the EPRDF regime.

percentage points which is equivalent to one-tenth of a hectare for the average farm in the sample. However, the practice of renting in was not affected by land certification perhaps because renting in is less risky than renting out, particularly by women who fear that renters would claim the land as their own after several years of renting. Similarly, Holden, *et al.* (2007) found that land registration and certification contributed to increased land rental market activity in Tigray region of Ethiopia, where only the names of the heads of the households were included on certificates. In some cases, the positive impacts occur but they are mixed with respect to time dimension and level of registration. A case study in St. Lucia shows that land titling did not provide a sustained increase in the level of transactions in the land market and that land titling did not provide the same level of impact on the different levels of formal registration namely individualized registration and family land registration (Griffith-Charles 2004). Perhaps, the smaller effect of land certification on land transaction in the long run is because of increasing costs of monitoring and maintaining formal titles over time. In this regard, some studies indicate that where registering land transactions is expensive, as it is the case in many countries, transfers tend not to be recorded, with the result that the register becomes rapidly outdated, limiting its potentially positive effects (Toulmin 2008, Platteau 2000, Firmin-Sellers 1999, Atwood 1990, Stanfield 1990). This has been observed in Honduras and Panama, for example (Stanfield 1990).

Other studies reveal the negative impacts of land certification on land transaction. A study by Holden and Tefera (2008) in Oromia and SNNP regions of Ethiopia shows that land rental transaction have been reduced because of land certification. The reason given for the negative impacts of the certification program was that formal reporting requirements, including the consent of the whole family. The formal requirements have constrained the husbands to engage in land transactions who had the liberty to do so without the consents of their wives. A study in Vietnam shows that land titling doesn't have significant impacts on land transaction (Do and Iyer 2008). In Kenya, land titling didn't bring significant changes on land transaction because indigenous tenure systems had already accommodated the development of land markets (Place and Migot-Adholla 1998).

These disparities on the impact of the program on land rental market might indicate the fact that the land certification program alone is not sufficient in farmers' decision to engage in both

formal and informal land transactions. Several studies corroborate this statement. For instance, studies by Carter and Olinto (2003) and Boucher, et al. (2004) reveal that individual titling does not seem to be a sufficient condition for these markets to develop or work properly.

2.4.Impact on land related disputes

One of the problems associated with land conflict in almost all farming areas is about boundary disputes. Conflict over land rights and property boundaries may give rise to social unrest, expensive litigation, and can lead to a general breakdown in law and order. In many countries where land is the major source of livelihood such as Ethiopia, disputes over land make up substantial proportion of court cases and the courts spend much of their time in resolving these matters (Holden, et al nd). Boundary disputes are particularly common nearby market centers and along main roads where the value of land is high. However, many of the land disputes occurring in developing countries could be resolved by improving the access of all parties to accurate information about the distribution of bundles of rights to land among potential claimants and by improving access to enforcement/dispute resolution (Marquardt 2006)

A number of studies indicate that land registration programs (if implemented properly) can reduce boundary disputes and litigations arising for such conflicts. A study conducted in Northern Ethiopia on the relationship between land registration and boundary disputes has revealed that the number of boundary disputes during and after the reform were more likely to have decreased than increased (Holden et al n.d). The dampening effect of certification was stronger the higher the quality of the implementation process in terms of plot border demarcation and plot size measurement and was weaker the higher the involvement of local elders in the registration process⁷. A study in southern Ethiopia also shows that land registration and certification has reduced the number of disputes arising from border encroachments and land inheritances (Holden and Tefera 2008) while (Giri 2010) came up with similar findings.

However, many of the benefits assumed to stem from land titling are not automatic (Bassett, et al 2007). Rather, land titling has conditional impacts of land boundary disputes. Primarily, it depends on existing social relationships and the degree to which customary systems are

⁷ The authors provide a speculative reason that elders have biased the work due to their self-interested motives and this has led to more conflicts.

functional. In situations where customary systems are weak and have lost legitimacy, where tensions among social groups are high to be handled by customary systems, and where land values are high and competition for land is fierce, land titling can reduce boundary disputes (IIED 1999, Toulmin 2008).

However, other empirical evidence shows that the impact of land titling on conflict is insignificant and, in many cases, negative. In Kenya, land related conflicts remained high even after the registration program and the contribution of the program was quite limited (Place and Migot-Adholla 1998). Perhaps, this is related to the high population pressure coupled with few opportunities outside of agriculture. In Ghana, a registration program which was poorly designed and poorly implemented increased land related conflicts (Toulmin 2008). Bekure et al (2006) in his review of land related studies notes that registration program led to increased social tensions and conflicts in Guinea Bissau and Mauritania due to their exacerbating effects on tenure insecurity. Land related conflicts may go beyond the individuals involved in land transactions and take higher forms. For example, in Cote d'Ivoire, the process of formalizing land rights has led to increased conflict and contributed to the current state of civil war (Bassett, et al. 2007).

2.5.Land Rights and Gender

Women in developing countries face difficulties with respect to ownership, control, transfer and disposal of land, houses, plots and business premises (World Bank 2012). Women frequently work on the land plots of inferior quality – and may lose access to that land when widowed or separated. Men often control the proceeds from the farm particularly in agricultural society. In many countries women don't have the right to enter into contractual agreements or work without their husband's consent while husbands have all those rights (Kairaba and Simons nd). This is essentially true for most rural communities where customary laws do not allow a woman (married or single) to own land or to inherit it (either from her parents or from her husband); these laws further recognize men as the sole decision-makers when it comes to property issues.

Study conducted by the World Bank group on the gender issue and best practices in land administration projects in 2005 shows that the rights of African women regarding land ownership and management vary dramatically according to the cultural and historical context of the region they are born into, as well as the region they marry into (World Bank 2005). In his survey of land tenure rights of African women, Kevane (2004) divided Africa into six specific

regions: those influenced by Islamic law, the matrilineal areas of Africa, the house-property systems of East Africa, the cocoa- and coffee-producing areas of West Africa, Sahelian West Africa, and southern Africa. Out of these six regions, those areas influenced by Islamic law, matrilineal areas, and the house-property systems of East Africa offer women greater opportunities for land rights than do the remaining three regions.

Land registration programs have been implemented in many other developing countries aiming, among others, at enhancing the position of women (and other vulnerable groups) with regards to land rights. Millions of titles have been provided to smallholders recognizing women as formal claimants of the land that belongs to their family although success stories might be different. In Asian countries, for example in Sri Lanka, land distributed by the state is distributed to male heads of households and joint ownership of land is not provided by the law. In India, land law is legislated at the state level, not nationally, so the legal land rights of women vary. Several states in India, such as Madhya Pradesh and West Bengal, have promoted the joint titling of land in their land reform programs (Agarwal 2003). In Cambodia, a survey showed that 20 percent of land titling was made in the wife's name, 5 percent in the husband's name and 70 percent was made under joint ownership which confirms the status of land as marital property, thereby reducing the potential for dominance of men in terms of land related decisions (Mehrvar, et al 2008).

In Latin American countries, State-sponsored redistribution and titling programs have recently begun to target women. The majority of agrarian reform legislation in Latin American countries privileged men by designating only household heads with agricultural experience as potential beneficiaries (World Bank 2005). Only less than 20% of the total beneficiaries are women in 10 countries for which gender-disaggregated data are available (World Bank 2005). However, a "second generation" of agrarian reform—one in which the clarification and legalization of property rights has taken precedence over redistribution—has seen the share of allocations and titles issued to women in the 1990s increase to close to 40 percent (World Bank 2005).

Furthermore, access to and control over land and property make women vulnerable to property grabbing; this is a situation in which orphans, widows or women who are separated from their husbands are often stripped of their belongings by family members (Rahmato 2009). They lose

their land – the main source of their livelihoods and welfare – and their house, shelter and other belongings. The goods taken are rarely recovered. However, these traditions changed since Ethiopian women have been equally exercising their rights over their family land after land registration and certification program were implemented in Ethiopia (Adenew and Abdi 2005).

The literature linking land registrations and gender are thin. Studies conducted in Ethiopia following the nationwide registration program conducted in the country since 1999 dominate existing literature on this issue. Thus, the results of existing literature in Ethiopia will be summarized first followed by findings of studies elsewhere.

Several studies conducted on the land certification process in Ethiopia highlight a positive outcome of land certification on women's tenure security. The primary area of concern in the land certification process is whether or not the process was biased against women and was participatory. So far there is no evidence that shows bias of land certification programs against women. Findings showed rather positive outcome of land certification on women. Women's awareness of the certification process is high (85%) in all regions (Deininger et al 2007). However in terms of participation there was low participation of women in the Land Administration Committee (LAC) and associated meetings during the land certification process. Women's representation in LAC was limited, only 20% of LACs included females, and was as low as 8% in Oromya (Deininger, et al 2007). Despite the low participation of women in the process their perception of tenure security has increased. Holden, et al (2008) stated land reform in Southern Ethiopia has contributed to increased perceptions of tenure security for both women and men.

Studies show that land certification has positive impacts on land rental markets and productivity of women. Involvement of female-headed households in land rental markets has increased after the land certification. Holden, et al (nd) found female-headed households with land certificates had become more willing to rent out their land and did so significantly more after land certification. Bezabih and Holden (2010) found out that land certification has increased land productivity among female-headed households though the productivity increment is not as much as among male-headed households. With regard to land productivity of rented-out land of female-headed versus male-headed households Holden and Ghebru (2011) showed that

productivity differences between rented-out and owner-operated plots of male and female headed households are weakly significant at the early stage of land registration in Tigray region of Ethiopia (i.e. in 1998) (10% level) and more significant after three years (i.e. in 2001). They attributed this temporal variability of the effect of land certification to the time lag needed by the reform to affect the ability of land owners to either select better tenants or to enforce better management by existing tenants.

Experiences from other countries in Africa, Asia and Latin America also show positive impacts of land registration on women's land right. The land policy reform adopted in 2004 by the Government of Rwanda had allowed women and female orphans to repossess and take control over their land which they were deprived of under the old and traditional system of land administration. Moreover, the revision of inheritance practice, and the implementation of land laws and regulations regarding land registration allow the Rwandan community to recognize the rights of women, female orphans over land. Success observed in Rwanda resulted from the decentralization approach used and the commitment of leaders at different levels of governance to enforce and implement government directives and laws (Uwayezu and Mugiraneza 2011). However, the regional variations are visible in terms of awareness and understanding land related legal provisions which show the existence of differences between the dwellers of the regions in terms of claiming their legal rights (Kairaba and Simons nd).

3. Methods of the study

3.1. Key Impact Indicators

Security of tenure for both individual and communal holdings cannot be measured directly and, to a large extent, it is what people perceive it to be. The attributes of tenure security may change from context to context. For example, a person may have a right to use a parcel of land for a 6 month growing season, and if that person is safe from eviction during the season, the tenure is secure. By extension, tenure security can relate to the length of tenure, in the context of the time needed to recover the cost of labor or capital invested. Thus, the person with use rights for 6 months may not plant trees, or invest in irrigation works or take measures to prevent soil erosion as the time is too short to benefit from the investments. In other words, the tenure can be insecure for long-term investments even if it is secure for short-term ones.

For key investments, tenure security isn't sufficient in itself. Rather, tenure security must be accompanied (depending on the investment) by mobilization of labor, accumulation of capital or finance, access to markets and technological opportunities, and accumulation of knowledge and management skills. These outcomes are not instantaneous and take time to accumulate. Thus for certain indicators (major land use changes such as a shift from annual crops to horticulture, fixed-place land investment, mobilization of capital), impacts can take upwards of 3-5 years before showing meaningful impact.

Table 1 provides the key indicators included in the ELAP baseline survey. They relate to the expected impacts of the land certification program launched in the four program regions for beneficiary farm households in selected program *woredas*. Impacts are expected in soil and water conservation, household investments in tree crop production, engagement in land transfers, food security and income, land related conflicts and disputes, and empowerment of women. The baseline survey will seek to capture attitudinal perceptions of tenure security that are subjective, along with perceptions of future impact, e.g. the inclination to invest, or inclination to engage in land market transactions will be measured.

Table 1: Selected Indicators and Performance Measures for the baseline survey

No.	Impact	Measurement Indicator	Survey instrument
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1	Level of soil conservation	<ul style="list-style-type: none"> • Length of soil and stone bunds, and strips of hedges constructed by survey participant, measured in meters • Length of soil and stone bunds, and strips of hedges constructed by others (public, NGO) but maintained /protected by survey participant, measured in meters 	<ul style="list-style-type: none"> • Household questionnaire
2	Level of water conservation	<ul style="list-style-type: none"> ▪ Number of water retention structures such as ponds and ditches constructed by survey participants ▪ Number of water retention structures such as ponds and ditches constructed by others (public, NGO) but maintained by self 	<ul style="list-style-type: none"> • Household questionnaire
3	Investment in tree crops	<ul style="list-style-type: none"> ▪ Number of surviving (i.e. 3 months plus) non-fruit trees planted during the last 24 calendar months ▪ Number of surviving (i.e. 3 months plus) fruit trees planted during the last 24 calendar months ▪ Seedlings of all types bought or self-produced as a percentage of total seedlings planted ▪ Number of surviving perennial crops (e.g. coffee, enset, hops, t'chat, etc.) planted during the last 24 calendar months 	<ul style="list-style-type: none"> • Household questionnaire
4	Engagement in land transactions	<ul style="list-style-type: none"> ▪ If holding is involved in land transactions (renting-out or sharecropping-out) ▪ If involvement in land transactions is long-term (long-term transaction is any transaction, renting-out or sharecropping-out, leasing-out, that operates for more than a single harvest season) 	<ul style="list-style-type: none"> • Household questionnaire
5	Level of utilization of improved short-term farm inputs	<ul style="list-style-type: none"> ▪ Amount of chemical fertilizer applied per hectare of cultivated land per crop season ▪ Amount of organic fertilizer applied per hectare of cultivated land per crop season ▪ Amount of chemical fertilizer applied per hectare of cultivated land per crop season ▪ Amount of improved seed used on the farm as a percentage of total seed used ▪ Amount of farm credit taken 	<ul style="list-style-type: none"> • Household questionnaire
7	Household and per capita farm income	<ul style="list-style-type: none"> ▪ Mean annual household level and per capita farm income realized from farming activities 	<ul style="list-style-type: none"> • Household questionnaire
8	Fencing or enclosing farm	<ul style="list-style-type: none"> ▪ If holding (any of the plots) is fenced with live/dead materials 	<ul style="list-style-type: none"> • Household questionnaire
9	Land related disputes experienced *	<ul style="list-style-type: none"> ▪ Number of land related disputes and conflicts reported 	<ul style="list-style-type: none"> • Household questionnaire
10	Perception of ownership of	<ul style="list-style-type: none"> ▪ Perceived security/insecurity of rights based on own rating of factors security as measured on a 	<ul style="list-style-type: none"> • Household questionnaire

No.	Impact	Measurement Indicator	Survey instrument
1	Level of soil conservation	<ul style="list-style-type: none"> • Length of soil and stone bunds, and strips of hedges constructed by survey participant, measured in meters • Length of soil and stone bunds, and strips of hedges constructed by others (public, NGO) but maintained /protected by survey participant, measured in meters 	<ul style="list-style-type: none"> • Household questionnaire
	secure and full usufruct rights in land	likert scale containing the following items: <ul style="list-style-type: none"> ➢ expectation of imminent land redistribution in the foreseeable future of losing land due to redistribution ➢ expectation to benefit from investing in long-term soil and water conservation measures ➢ Attitude/ plan towards renting-out of land to others ➢ Attitude/ plan towards sharecropping-out land to others 	
13	Amount of wealth created	<ul style="list-style-type: none"> ▪ Livestock ownership (different types of animals) 	<ul style="list-style-type: none"> • Household questionnaire
14	Farm Size	<ul style="list-style-type: none"> ▪ Impact on fragmentation and consolidation of farms 	<ul style="list-style-type: none"> • Household questionnaire
17	Governance	<ul style="list-style-type: none"> ▪ Impact on perception of land administration institutions 	<ul style="list-style-type: none"> • Household questionnaire

Note: One of the expected indicators is “land related conflicts”. However, the outcome of this effect could be difficult to assess, e.g. land related disputes arising from undemarcated boundaries may decrease following certification. However, as the value of the landholding increases as an impact of certification, other types of disputes, particularly those related to inheritance, lease claims, and land speculation are likely to become more prevalent. Note that land related disputes with serious consequences particularly among members of the same extended family were rampant in the pre-revolution Ethiopia in areas where land was privately owned and needs to be accounted for and controlled in the analysis.

3.2. General approaches and data collection instruments

Several approaches were used in the study which include household survey, focused group discussions and key informant interviews. The household survey was designed to collect quantitative data from farm households whereas focused group discussions and key informant interviews were made to collect qualitative data. Semi-structured questionnaires and checklists were used to collect the data. The household survey questionnaires were first prepared in English and comments were obtained from ELAP management team and USAID. The final versions of the questionnaires were translated into Amharic to make data collection easier and to reduce language related errors.

3.3. Gender Considerations

Information is important on gender mainstreaming at all levels from the formulation of policy and legislation to planning and monitoring of specific interventions. A gender disaggregated data is useful to (1) understand the present status of men and women with regard to tenure security, the different needs of men and women to attain tenure security, and the decision making process with regard to land certification and tenure security, (2) analyze gender aspects of policies and legislation on land tenure administration, and (3) develop gender indicators and checklist to monitor the impact of land tenure administration on men and women. Thus, separate data collection instruments (i.e. questionnaires and checklists) were prepared to address specific issues of the two gender categories.

3.4. Selecting the study areas and households

ELAP is being implemented in nine high investment potential *woredas* located in Amhara, Oromia, SNNP, and Tigray regional states. These are Fentale, Boset, Jeju, and Dugda *woredas* in Oromia, Wemberima *woreda* in Amhara region, Wendogenet and Alaba *woredas* in SNNP

region, and Raya Azebo and Tahtay Adiabo *woredas* in Tigray region. Out of these Fentale and Boset *woredas* were dropped based on the recommendation of ELAP PCU while all of the remaining *woredas* were considered in the study. The work in Fentale and Boset involved allocation of land for newly settling Kereyu pastoralists that have very limited or no experience with land administration issues raised by the survey instruments and the checklists of informant interviews and FGDs.

Selection of *kebeles*: 18 ELAP program *kebeles* were selected from the sample *woredas* purposively based on the recommendation of ELAP PCU. All of these are high potential *kebeles* with respect to agricultural investments as identified by the project management. Moreover, 7 non-program *kebeles* were selected randomly. The latter were supposed to serve as control *kebeles* to measure impacts of the interventions during the follow up study. Thus, the ELAP baseline survey covered 18 program *kebeles* and 7 non-program *kebeles* located in all of the four regions and target *woredas*. See annex for list of *kebeles*.

Selection of Households: Thirty eight households were randomly selected from each of the selected *kebeles* (both ELAP and non-ELAP *kebeles*) using available membership registries as a sample frame. To ensure the inclusion of female-headed households into the sample, members were stratified into two based on the sex of household heads and a proportionate to size sampling procedure was applied. Table 2 displays the sample size and distribution across the study regions, *woredas*, and *kebeles*.

Table 2: Sample Size and Distribution of ELAP Baseline Survey

Sample groups	Units	Program Regions				Total
		Amhara	Tigray	Oromia	SNNP	
Samples from households WITH land certificates	Woredas	1	2	2	2	7
	<i>Kebeles</i>	1	5	7	5	18
	Households	38	190	266	190	684
Samples from households WITHOUT land certificates	<i>Woredas</i>	1	2	2	2	7
	<i>Kebeles</i>	1	2	2	2	7
	Households	38	76	76	76	266
Total household		76	266	342	266	950

3.5.Implementation of the field work

The field work was conducted in April and May 2012. The activities during the field work constituted key informant interviews, focus group discussions, and household survey. Each will be briefly described as follows:

3.5.1. Key Informants Interview and Focus Group Discussions

Key informants' interviews (KII) were conducted by the research team composed of an agricultural economist, a sociologist, and a gender expert. The interviews typically consisted of *kebele* chairpersons, managers of *kebele* administration, and experts working on land administration issues. Two to three key informant interviews were held in each of the target *kebeles*. The aim of the key informant interviews was to get an overall picture about the land registration process, land tenure security, the realized benefits and expectations of the land users in the study areas and existing challenges.

In addition to KII, the research team conducted focus group discussions to collect detailed qualitative information on land tenure security and impact/benefits of land certification. Two group discussions were conducted in each *kebele*: one consisting of only women (constituting wives and household heads), and the other consisting of diverse personalities. Focus group discussions with women were held separately so that they could openly discuss their perceptions and attitudes on tenure legislation, legal frameworks and its implementation process, land tenure security, and the perceptions and actual benefits of the land title registration. The mixed group includes diverse personalities such as elders, active adults, women, youth, and landless. The aim here is to get diverse opinions regarding land registration. Some 10 to 15 people participated in FGDs per *kebele*.

3.5.2. Survey workers

The household survey was coordinated by an experienced person who was hired for 3 months. Qualified survey workers (supervisors and enumerators) were recruited and trained to conduct the baseline survey in the selected areas. Selection criteria for the field staff included ability to speak Amharic and local languages, previous experience in survey works (particularly in agriculture and rural development), and gender. Some of the enumerators and supervisors were those who showed superior performance during the ELTAP baseline survey.

3.6.Data management and analysis

Database Preparation: A professional and well-experienced data manager and computer programmer has prepared the data entry format using suitable software. Before entry, questionnaires were thoroughly checked for consistency of responses, necessary skips, and range of data values. The data entry process followed data editing, listing, coding and verification. The data entry module was designed such that range rules are properly specified and errors were easily identified. Well experienced data entry operators did the task of data entry under the supervision of the data manager and survey coordinator.

Data Analysis: Data has been analyzed using descriptive statistical methods such as mean and percentages. Discrete analysis like ANOVA, various relevant tests like Chi-square, t-value and f-value has been employed to establish the existence of statistically verifiable (significant) differences among different group of households (for instance, between regions and between certificate holders and non-holders).

4. Results

This section presents the preliminary analysis. However, all important questions are addressed. Results are presented in aggregate terms for all sample households. Regions are compared with respect to all variables considered. Moreover, wherever it makes sense certificate holders have been compared to non-holders of certificates. While comparisons are made to provide a disaggregated picture of the study areas, our samples households in each region are by no means representatives of the regions or *woredas*. Rather, they represent ELAP target areas in the four regions and, hence, we remind readers to understand the results in that way.

4.1. Demographic and Socio-economic characteristics of the sample households

Some of the demographic features of the sample households are presented in Table 3. The mean household size of the study sample is 6.21, which varies between 5.07 in Tigray region to 7.35 in SNNPR which is statistically significant. As expected, the majority of the sample households are male-headed (81%). Female-headed households constitute relatively high percentage of the sample households in Amhara and Tigray as compared to Oromia and SNNPR. In this regard, the difference among the study regions is statistically significant. Household heads are 48 years old on average. The majority of the respondent household heads are married (77%) and the remaining are single (3%) or divorced (7%) or widowed (13%). The most common practice of marriage is monogamy (88.2%⁸). The remaining are polygamous families of different type⁹ which are found in SNNPR (30%) and Oromia (13.6%). Divorced households are relatively high among the sample households in Amhara (21.1%) and Tigray (13.2%) as compared to those in Oromia (3.2%) and SNNPR (1.1%).

About 48% of respondents are literate out of which about 59% completed grade 1 to 8. The distribution is not uniform across regions, however. Literacy is the highest in Oromia (53.5%) and the lowest in Tigray (39.1%). The difference among the regions is significant. Household heads are generally better in terms of education as compared to their spouses (which are

⁸ Includes female-headed households.

⁹ *polygamy type 'A' when more than 1 wife but all wives live as a single household feeding from same production; polygamy type 'B' when more than 1 wife but wives live in their own houses but share food from the production from same land ; polygamy type 'C' when more than 1 wife but other wives than the primary one live independently on their own land and production; polygamy type 'D' when more than 1 wife but other wives than the primary one live outside the kebele of a husband.*

primarily housewives). For instance, only 25.3% of the primary spouses are educated while the corresponding figure is 48% for household heads. In terms of the education status of spouses the variation between regions is not so large as compared to that of household heads.

Table 3: Demographic characteristics of sample households

Region	Sex of hhh (% male)	Family size (mean)	Age of hhh (mean)	Literacy of hhh (% literate)	Literacy of primary spouse (% literate)	Marital status of hhh (% married)	Family type (% of non-polygamous households)
Tigray	72.2	5.07	48.88	39.1	26.8	66.9	100
Amhara	71.1	5.43	46.08	46.1	28.8	68.4	100
Oromia	81.3	6.37	49.29	53.5	25.7	77.8	89.3
SNNPR	94.0	7.35	48.40	49.8	23	88.1	73.1
Total	81.5	6.21	48.67	47.8	25.3	76.9	88.5
Chi-sq/F value	48.8***	36.6***	1.1	13.1***	1.2	36.9***	103.8***

*** shows statistical significance at 1% level

Source: Field survey (2012)

About 26% of the sample households are engaged in activities other than agriculture. The rate of participation is significantly different between male-headed households and female-headed households whereby the latter have higher participation rate (37%) than the former (24.3%) ($p < 0.01$). The most common secondary economic activity is petty trade (11.1%) which is followed by casual labor work (6.8%) and handcraft (3.3%). Other secondary economic activities include, among others, engagement in national productive safety net programs, guarding, religious works, fishing, and livestock fattening. There is significant difference between male-headed households and female-headed households in terms of participation in certain activities but not in others. Participation rates of female-headed households are significantly higher with regards to petty trade, casual labor work, and the safety-net program. In all of other categories of secondary economy, female-headed and male-headed households had, by and large, similar rate of participation.

Variations exist among the study regions with regards to the participation of the sample households in secondary economic activities and income generated from these activities (Table 4). The percentage of the sample respondents who were engaged in secondary economic activities was relatively high in Tigray and Oromia as compared to Amhara and SNNPR.

The mean income of the households from secondary activities from February 2011 to January 2012 (i.e. *Yekatit* 2003 E.C to *Tir* 2004 E.C.) was about 4490 birr (USD265¹⁰). The minimum income was 100 birr while the maximum was 61,000 birr. Male-headed households earned about 5060 birr which is significantly higher than the amount that female-headed households earned (i.e. 2739 birr) ($p < 0.01$). As displayed in Table 4, the difference among the regions is also significant though not as much as the difference between the gender-based categories. In this regard, SNNPR and Amhara have apparently higher figures.

Table 4: Participation in secondary economic activities

Region	Participate in secondary economic activity (%)	Income between February 2010 to January 2012	
		Mean	SD
Tigray	38.0	4010.59	7157.323
Amhara	14.7	6486.00	11902.276
Oromia	29.4	3801.61	4546.301
SNNPR	15.3	6810.46	9509.061
Total	26.6	4490.60	7064.199
Chi-sq./F value	41.9***	2.2*	

*,*** show statistical significance at 10% and 1% levels

Source: Field survey (2012)

4.2. Land Possession and use

Land is the most valuable asset of farm households in Ethiopia. Land is acquired through various means in the study areas. About 57% of the parcels have been acquired from kebele administration¹¹ whereas the remaining parcels have been acquired through other means (Table

¹⁰ The average exchange rate of USD against Ethiopian birr was 16.96 during February 2011 - January 2012.

¹¹ Includes the so called shigishig meaning land redistribution.

5) The other modes of land acquisition include inheritance (27.5), gifts from other households/individuals ¹² (9.1%), acquisition through marriage (2.4%), forest clearing or conversion of pasture land (1.3%), and land purchase (1.5%)¹³. The majority of the sample households acquired land from kebele administration in all of the study regions with one exception. The exception is SNNPR where only 12% of the parcels were acquired land through kebele land allocation¹⁴. Indeed, land acquisition through kebele allocation is relatively high in Amhara region which may be due to the relatively recent land redistribution practice in this region¹⁵ (i.e. in 1997/98). On the contrary, land redistribution has not been implemented in SNNPR and Oromia for nearly a quarter of a century which might have led farmers to resort to other forms of land acquisitions such as inheritance from parents. Perhaps, the share of households who will acquire land through kebele allocation may decline in all regions in the future as land redistribution is not promoted by regional governments to prevent further land fragmentation while other forms of land transfer such as inheritance and denotation are allowed in all of the study regions¹⁶.

Table 5: Land acquisition and allocation

Region	If household land acquired through kebele (% yes)	No. of Parcels ¹⁷ (mean)	Mean plot size (ha)	Land holding (ha)				Private pasture land (% own)	Communal pasture (% own)
				annual crops	perennial crops	Other crops	Total		
Tigray	74.2	2.35	0.54	1.25	0.02	0.10	1.37	0	83.5
Amhara	81.2	3.57	0.46	1.55	N	0.11	1.66	11.8	88.2
Oromia	60.3	3.92	0.62	2.25	N	0.23	2.48	37.4	64.2
SNNPR	12.2	1.9	0.70	0.76	0.22	0.48	1.46	24.6	25.7

¹² Land gifts are most likely obtained from a family member but also can be obtained from any person.

¹³ Land selling is illegal in Ethiopia. The responses indicate the existence of some kind of 'black market' which is going on, perhaps, due to lack of awareness on the existing land law or lack of its enforcement.

¹⁴ The traditional land tenure system in Southern Ethiopia is characterized by patrilineal inheritance.

¹⁵ Land redistribution is implemented through kebele administrations.

¹⁶ In Oromia and Amhara regions land redistribution is officially prohibited. See Article 14 No. 1 and Article 8 No. 1 of the land laws of Oromia and Amhara, respectively.

¹⁷ includes grazing and forest lands but does not include plots rented-IN and Sharecropped-IN from others.

Total	56.8	2.88	0.60	1.5	0.07	0.26	1.83	21.3	60.7
Chi-sq/F value	567.4***	104.4* **	13.3* **	94.4* **	71.2***	11.4** *	40.4* **	130.2* **	220.8***

*** shows statistical significance at 1% level

Source: Field survey (2012)

All of the sample households have at least one plot of land. The average number of plots per household is 2.88 (i.e. 100 households own on average 288 plots of land). Households in Oromia have the largest number of plots (3.92) and those in SNNPR have the lowest (1.9). The average plot size is 0.6 hectare. It varies from 0.46 hectare in Amhara to 0.70 hectare in SNNPR. The differences among the study regions are statistically significant both in terms of the number of plots cultivated per household and the average plot size.

The mean total land holding of the sample households is 1.83 ha. It varies from 1.37 ha in Tigray to 2.48 ha in Oromia. The variation among the regions is significantly high. The average holding is higher than the national average reported by CSA during the same year which is about 1.22 ha (CSA 2012). About 82% of the land is used for annual crop production. More than 90% of land is allocated for annual crops in Amhara, Tigray, and Oromia. In SNNPR, households allocate only 52% of their land to annual crops; about 33% of the land in this region is allocated for perennial crops¹⁸.

The study areas are characterized by crop-livestock mixed farming system. Thus, households have plots of land allocated for grazing. About 21% of the households own private pasture land while about 60% of the households have access to communal pasture land. Access to pasture land varies across regions. While 37% of the households in Oromia have private pasture land none of the households in Tigray have private pasture land. The proportion of households having access to communal pasture land is the highest in Amhara (88.2%) and the lowest in SNNPR (25.7%).

The “other crops” category in Table 5 mainly constitutes garden crops such as root crops, fruits, and vegetables. The average size of land reserved for garden crops is 0.14 ha which is more than

¹⁸ This refers to all perennial crops.

one-half the average land corresponding to the ‘other crops’ category. Nearly one-half (i.e. about 48%) of the sample households have reserved land for garden crops. In SNNPR, the percentage of households who reserved farm plots for garden crops is relatively high (64.6%) as compared to other regions (i.e. 35% -52%). Moreover, the sample households in SNNPR reserved larger size of land (i.e. average 0.3ha) than those in other regions (i.e. 0.07 ha-0.08 ha). The result is an expected one given the fact that garden crops are more important in family cuisine in the southern part of the country than in the other parts.

Farmers were asked about their plans regarding land use. About 70% of them responded that they would continue the current farming practices whereas about 26% indicated that they would intensify their farm more by making additional investments. The pattern is similar across regions in the sense that most of them have planned to continue the existing practices as they are while about a quarter of them have a plan to intensify it. SNNPR is a bit better than other regions in terms of percent of respondents would like to intensify (i.e. about 38%)¹⁹.

4.3. Knowledge of land laws and perceptions on existing land Rights

4.3.1. Awareness on land laws and regulations

Institutions affect human behavior and shape human decisions and actions (North 1991). However, institutions affect human behavior and action so long as human beings are aware of the institutions and their implications. In this regard, the sample households were asked whether they are aware of existing land laws and regulations and how much they understand them. The results are described as follows.

Most of the respondents (93.1%) are aware of existing land laws and regulations. However, only 55% of the respondent can understand the existing land laws (Table 6). The remaining 44% of the farmers either understand the laws very little (42.1%) or do not understand them at all (2.9%). The rate of awareness is the least in Amhara region as compared to other regions. In terms of farmers' understanding of existing land laws, Oromia is superior to other regions with 60.6% while others are more or less similar. In both cases, Chi-square test results show that regional differences are significant.

¹⁹ The higher desire for intensification in SNNPR might have arisen from the fact that one of the two sample woredas in SNNPR, Wendo Genet, is endowed with plenty of ground water resource and good climate for cash crops such as sugar cane, coffee, khat and fruits and vegetables; it seems that farmers are eager to benefit from the potential.

Table 6: Awareness and understanding of land laws

	Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. Value
Are you aware of the existence of laws on land rights and obligations? (%yes)	94.0	69.7	96.8	94.0	93.1	72.2***
Do you understand the laws on land rights and obligations? (% yes)	50.8	49.1	60.6	53.4	55.0	15.2**
Do you think that the existing administrative/ judiciary institutions /arrangements are CAPABLE of enforcing land rights and obligations? (% yes)	73.3	69.7	72.4	67.4	71.0	24.6***
Do you think that the existing administrative / judiciary institutions /arrangements are FAIR ENOUGH in enforcing land rights and obligations? (% yes)	73.3	67.1	46.7	58.8	59.2	80.8***
How confident are you that the government protects your right of land user? (% confident or very much confident)	88.3	94.7	96.5	86.8	91.4	22.4***

,* indicate significance at 5%, and 1% levels, respectively

Source: Field survey (2012)

The majority of the respondents (71%) believe that existing administrative/ judiciary institutions are capable of enforcing land rights and obligations while about 15% believe that the institutions are not capable. The remaining ones do not have any opinion. There is significant difference among the study regions in terms of the percent of farmers who have positive perceptions about the capability of existing administrative/judiciary institutions to protect land rights, as shown by Chi-square tests. The percent of farmers who have negative perceptions is relatively high in Oromia and in SNNPR as compared to the remaining two regions.

About 58% believe that the local administrations judiciary institutions are fair enough in their decisions. However, those with negative perceptions are also substantial (26.5%). Tigray and Amhara are better than Oromia and SNNPR in terms of the fairness of local authorities in

protecting land rights with 73.3% and 67.1% of positive responses, respectively. Oromia is the least of all with 46.7% of positive responses. The Chi-square test shows that regional differences are statistically significant.

Furthermore, the majority of the respondents (91.4%) are confident that the government (either regional governments or the Federal government) can protect their right of land as users. About 68% are, in fact, very much confident about this while only 2.7% are not confident. The rate of confidence varies among regions from 86.6% in SNNPR to 96.5% in Oromia. The percentage of farmers who do not have confidence on the government institutions with regard to protecting land rights is relatively high in SNNPR (8.3%) as compared to other regions although the figure is quite small as compared to the positive responses. Regional differences are statistically significant with regards to this variable.

4.3.2. Perception on land rights

Almost all of the sample households reflected their perception on land rights. Results show that the households perceive the rights they have to the land under their possession differently (Table 7). More than 95% of respondents believe that they have use rights. The majority of the households also believe that they have the right to bequeath to their heirs (64.5%) and the right to rent-out their land to others (64.4%). While 27.1% of the sample households believe that they may use their land as collateral to get credit only a few ones (5.5%) believe that they have the right to sell their land.

There are significant differences among the study regions with regard to perception of households on the rights they have on land under their possession. While the difference is not substantial with respect to the right to use the land it is quite visible and statistically significant with respect to other forms of rights. With regard to the rights to bequeath land to heirs the highest percentage of positive response was observed in Amhara region and the lowest was observed in Oromia region. A similar pattern is observed regarding the right to rent/share-out land to others. With regard to the right to use land as collateral as well as the right to sell land, the percentage of positive responses is the highest in SNNPR and the lowest in Tigray.

Land laws in all of the study regions grant farmer households the right to obtain and use rural lands for an unlimited period of time (ONRS 2007, TNRS 2007, SNNPR 2007, ANRS 2006). Moreover, they allow households to bequeath land to heirs and to rent/share out land to others. However, the right to use land as collateral to get credit is not explicitly written into the land

laws of the study regions. Selling land is allowed in none of the study regions which is consistent with the federal land law. Given the content of the regional land laws, the results show the existence of misperception among farmers regarding rights that they can exercise. While the misperception is small with regards to the right to use land and the right to sell land it is substantial with regards to the right to bequeath land to heirs, the right to rent/share out land, and the right to use land as collateral. In fact, the results show the existence of regional variations with respect to the prevalence of misperceptions among the sample households. Misconceptions are the highest in Oromia with respect to the right to bequeath land to heirs and the right to rent/share-out land to others while they are the lowest in Amhara region. With respect to the right to use land as collateral, the highest rate was computed for SNNPR²⁰. The differences among the four regions are statistically significant in all categories of right except for the right to use and the 'others' category.

Table 7: Perception of households on rights to their land in percent

Knowledge of:	Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
Right to use (%)	96.2	98.7	94.4	95.5	95.6	3.1
Right to bequeath (%)	63.2	81.6	56.6	70.9	64.5	24.0***
Right to rent/share/contract out (%)	75.2	86.8	50.7	64.6	64.4	57.9***
Right to use it as collateral for credit (%)	15.4	32.9	21.7	44.0	27.1	63.6***
Right to sell (%)	4.5	-	5.0	8.6	5.5	10.0**
Others (%)	3.0	-	3.5	2.6	2.8	2.9
I don't know (%)	-	1.3	-	-	0.1	11.5***

, * show significance at 5% and 1% levels

Source: Field survey (2012)

²⁰ The reason for the variation in misconception among the study regions is not clear from our data. This can be a potential area of investigation in the future.

4.4.Land registration

In accordance with Federal Proclamation No. 456/2005 (FDRE 2005), Amhara, Oromia, Tigray and SNNP regional states have issued region-specific land administration and use proclamations and commenced with land registration system. The basic characteristics of the registration system in the four regions are more or less similar in terms of record format, registration system, right being registered, registered right holders, and registration of polygamy. However, the registration process was not as smooth as one might expect. Interview results indicate that farmers were reluctant to register their land at the beginning of the process because of different rumors and confusions among farmers regarding the government's intention behind land registration and certification including taxation, redistribution to others, etc. However, after continuous awareness creation and persuasion by local land administration offices the registration process went ahead smoothly.

Table 8 shows the distribution of first-level and second-level land certificates across regions. Eleven percent of the sample households do not have land certificate while the remaining 89% households have either first level or second level land certificates²¹. First level certificates have been given to households in all regions whereas second level certificates have not been issued in the sample *woreda* in Amhara region (i.e. Wenberima *woreda*). While second level certificates are advanced versions of first level certificates and second level certificate holders are expected to get first-level certificates, in fact, not all second level certificate holders are holders of first level certificates. Rather, about 43% of the second level certificate holders do not have first level certificates.

Regional differences are significant in terms of the status of land certification. Relatively high percentage of households in SNNPR did not receive land certificate whereas all of the sample households in Amhara region received first level certificates. The percentage of households without certificate in Oromia is negligible (1.8%) while that of Tigray is small (10.2%) as compared to SNNPR. In this regard, the difference among the regions is highly significant as shown by Chi-square statistic. In terms of the percentage of households who received first-level

²¹ Some second-level certificate holders have also first-level certificate.

certificate SNNPR is the least and Amhara is the best by far followed by Tigray and Oromia. This difference is significant at 1% level. In terms of second level certification, Oromia is the best with 60% of certificate holder and Amhara is the least with zero figure. The difference among the regions is again highly significant.

Table 8: Sample farm households by status of land certification

	No certificate	First-level certificate	Second-level certificate
Tigray	10.2	59.4	30.5
Amhara	-	100	-
Oromia	1.8	38.6	59.6
SNNPR	26.9	26.1	47.0
All	11%	45.8%	43.2%
Chi-square value	108.1***	158.7***	114.7***

*** indicates significance at 1% level

Source: Field survey (2012)

Table 9: By the name of whom the certificate was issued

	Tigray	Amhara	Oromia	SNNPR	All	Chi Sq. Value
By the name of the husband	37.1	15.8	7.7	2.6	15.5	125.2***
By the name of the wife	1.3	-	0.6	1.5	0.9	2.1
By the name of husband and wife	48.9	84.2	90.4	91.8	78.6	173.8***
Others	12.7	-	1.3	4.1	5.0	44.1***

*** shows significance at 1% level

Source: Field survey (2012)

The majority of the certificates have been issued by the name of husband and wife (Table 9). However, about 16% of the certificates have been issued by the name of husbands alone while independent certificates to wives in the presence husbands are rare (i.e. 0.9%). About 65% of the joint certificate holders confirmed the joint nature of the certificates since the names of both have been written on the certificate whereas about 16% consider the certificates as joint certificates because their pictures appear on them. There are significant regional differences with regards to whom the certificates have been issued. In Tigray, the percentage of certificates issued by the name of husbands and wives (i.e. joint certificate) is relatively low as compared to other regions.

Perhaps this is due to difference between Tigray region and other regions in terms of the provisions stated in the land laws. While the necessity of issuing joint land certificates for spouses is stated explicitly in the land laws of Oromia, SNNPR and Amhara, this provision is not explicit in the Tigray's land law²².

4.5. Perception about tenure security

A large majority of the respondents believe that having a certificate of possession is a guarantee of secured hold over one's land. The variation among the study regions and status of land certification is not statistically significant (Table 10 and Table 11). Most of the respondents (88.7%) do not expect land redistribution in their kebeles in the coming five years. These results indicate that farmers feel secured about their land possession which suggests that the government has made a credible commitment NOT to redistribute smallholder lands. Moreover, expectations about land redistribution are significantly different across the study regions. The percentage of respondents who expect land redistribution in their kebele in the coming five years is the largest in Tigray (20.3%) and the smallest in SNNPR. Similarly, perceptions on the possibility of land redistribution vary among first-level certificate holder, second-level certificate-holders and non-holders of land certificates. In this regard, the percent of households who expect land redistribution is relatively large among non-holders of land certificates. About 95% of the farmers are confident that their current land possession would remain within the control of family members (i.e. parents or children) during the coming 15 years. The difference among regions is statistically significant. However, no significant variation exists among the three categories of households.

Table 10: Perception of respondents on tenure security, by region

	Tigray	Amhara	Oromia	SNNP	All	Chi Sq. value
I believe that land registration program will assure one's security over land (% yes)	98.9	100	99.1	99.2	99.1	0.9
I believe that land redistribution is likely to take place in the coming 5 years (% yes)	20.3	9.2	9.1	6.0	11.3	31.0***
I believe that my current land will remain within my control in the coming 15 years (% yes)	95.1	97.4	92.7	97.8	95.2	9.3**

²² See Article 24 No. for Amhara region, Article 15 No. 8 for Oromia region, and Article 6 No. 4 for SNNPR.

Note: Farm inputs include improved seeds and fertilizer. Other expenses include school expenses
 ,* show significance at 5% and 1% levels
 Source: Field survey (2012)

Table 11: Perception of respondents on tenure security, by status of land certification

	No certificate	First-level certificate	Second-level certificate	Chi Sq. value
I believe that land registration program will assure one's security over land (% yes)	98.9	99.3	99.0	0.26
I believe that land redistribution is likely to take place in the coming 5 years (% yes)	18.1	13.3	7.5	12.3***
I believe that my current land will remain within my control in the coming 15 years (% yes)	94.3	95.6	94.9	0.46

Note: Farm inputs include improved seeds and fertilizer. Other expenses include school expenses
 *** show significance at 1% levels
 Source: Field survey (2012)

The sample households were asked about the possible impacts of the land certification program on soil conservation and tree planting practices. Most of the respondents (98.8%) believe that they would stand to benefit in the future from whatever soil and/or water conservation measures that they may practice on their land. Again the results are high in all of the study regions and do not depend on the status of certificate holding versus not-holding.

With respect to land renting, about 68% of the respondents do not feel that it would be risky to rent/share out their lands for one season. However, the percentage of farmers who have a contrasting view is also substantial (31.8%). The percentage of farmers who are reluctant to rent-out land even for one season is relatively high in Amhara region (50%) as compared to other regions (i.e. 35.3% in Tigray, 28.3% in Oromia, and 27.6% in SNNPR). With respect to the status of certificate holding/not-holding, holders of first-level certificates are more reluctant. The percentage of farmers who are willing to rent/share-out land to others for five years is lower than if it were for one season. About 48% of the respondents believe that it would be risky to rent/share-out land to others for five years. The figures corresponding to Tigray, Amhara, Oromia, and SNNPR are 48.5%, 51.3%, 43.1%, and 51.5%, respectively. The results for Tigray and Oromia are contrary to expectation given the fact that the maximum length of contract

period allowed by the law is 3 years in these regions²³. With respect to the status of land certificate holding/not-holding, holders of second level certificates are more optimistic about the consequences of renting/sharing-out land for five years while first level certificate holders and those without certificate are more or less similar²⁴.

The percentage of respondents who would feel more secure to enter into any sort of business transaction involving credit is higher among farmers who have a certificate of possession compared to those who do not (88.8%). The result is high in all regions (more than 80%) but it is exceptionally high in Amhara region (i.e. 100%). The high percentage values in this regard imply that land certification may enhance informal credit in rural areas. However, whether it encourages formal credit depends upon the legal framework within which informal loan providers are operating and how much these actors perceive land as a valuable asset to them to take as collateral. In Ethiopia, selling or mortgaging land is prohibited by the federal as well as regional governments and thus even informal money lenders may be reluctant to take land as collateral to provide credit. Thus, the result shows the potential impact of land certification on rural credit market but not the actual one.

4.6.Land transactions

Informal land transactions are common in rural Ethiopia. While the majority of peasant households acquire land through formal land allocations, a substantial proportion of them depend on informal land markets (Tesafa and Hundie 2009). As displayed in Table 12, 46% of the sample households participated in informal land market transactions in the past season. About 23% participated as land suppliers whereas 26% participated as land seekers. The aggregate rate of participation significantly varies across regions. The rate of participation is the highest in Amhara region and the lowest in SNNPR²⁵.

²³ The length contract period allowed by regional land laws vary among regions. For traditional farming, peasants can rent out their land for a maximum of 3 years in Tigray and Oromia and for 5 years in SNNPR. For mechanized farming the maximum contract period ranges from 15 years to 25 years. The provision is highly relaxed in Amhara region; a peasant can rent out land for 25 years either for traditional or mechanized farming.

²⁴In their responses, households considered both formal and informal land transactions.

²⁵ In addition to time-specific land transactions, about 4% of the sample households rented-out their land for unspecified period of time on mortgage basis. However, mortgage practices are illegal in all regions and, hence, those who are practicing it can be considered as violators of existing land laws. Such violations might have

The average land size supplied to rental market was 0.81 ha which varies from about 0.6 ha in SNNPR to 1.12 ha in Amhara region. The difference among the regions is significant at 1% level as shown by F statistic. On the other hand, the average size of rented-in land was 0.92 ha which varies significantly across the study regions from 0.7ha in SNNPR to 1.24ha in Amhara region. sample The average contract period is about 2.5 years which varies from about 1.8 years in Oromia and Amhara regions to 3.8 years in Tigray. The difference is significant at 1% level. With the exception of Tigray region, the average lengths of the contract periods lie within the range allowed by regional land laws²⁶.

Table 12: Participation in informal land transactions in the past season, by region

	Rented/s hare out (%)	Rented/ share in (%)	Aggregate participation (in/out/both)	Mean land (ha)		Average contract/ rental period (years)	Maximum contract period allowed(years) ²⁷
				Rented out	Rented in		
Tigray	20.9	22.0	41.4	0.81	1.02	3.57	3
Amhara	23.7	50.0	71.1	1.12	1.24	1.83	25
Oromia	27.5	25.7	50.4	0.84	0.88	1.84	3
SNNP	19.2	23.5	41.0	0.57	0.70	2.52	5
All	22.7	26.0	46.7	0.79	0.92	2.52	
Chi-sq./F-value	6.1	25.9***	26.0***	5.56***	4.78***	3.54**	

** & *** indicate level of statistical significance at 5% and 1% respectively.

Source: Field survey (2012)

About 50% of households with first level certificates and 46% of those with second-level certificates rented-out/shared-out their farm land during the past season. The difference among the three categories of households is statistically significant. The rate of participation was apparently high among holders of land certificate (first level and second level certificates) as compared to non-holders (Table 13). Perhaps, this result implies the positive impact of land certification on land transaction as it reduces the suspicion of land holders that they might lose their land to non-trusted renters/sharecroppers. However, the test result may not lend itself to strict interpretation because the differences among the three groups of households tend to disappear when the participation of land suppliers and land seekers are separately evaluated.

happened because of lack of awareness on the laws. In this regard, there no visible difference among regions as well as among certificate holders and non-holders.

²⁶ In Tigray, the land law precludes renting/sharing out to peasant tenants for more than 3 years (Article 6, no. 2).

²⁷ Refers to only peasant to peasant contract for traditional farming.

Table 13: Participation in informal land transactions in the past season, by status of land certification

	Rented /share out (%)	Rented /share in (%)	Aggregate participation (in/out/both)	Mean land (ha)		Average contract/rental period (years)
				Rented out	Rented in	
No certificate	16.3	21.9	36.5	0.74	0.84	3.28
First-level certificate	24.0	27.6	50.2	0.85	1.03	2.25
Second-level certificate	23.1	25.3	45.6	0.72	0.81	2.74
Chi-sq./F-value	2.83	1.63	6.56**	1.45	2.65*	1.0

*, and ** indicate level of statistical significance at 10% and 5% respectively.

Source: Field survey (2012)

Farmers engage in land rental markets for a number of reasons. Shortage of oxen for draft power and labor are the major factors explaining why the sample households rent-out their farmlands constituting 45.1% and 37.6% of the reasons respectively (Table 14). Liquidity constraint (lack of money for farm inputs and other expenses) is another factor that forces households to rent-out farm land to others (28.3%) while small percentages of farmers rent-out their land to earn income (3.5%), for health reasons (1.7%), far distance from home (0.6%), and other reasons (9.2%). In fact, regions vary in terms of the dominance of the two factors. Shortage of adult male labor is the most important factor in explaining the decision to rent-out farmlands in Tigray and Amhara regions while it is not in Oromia and SNNPR. The difference among the regions statistically significant. Shortage of oxen is most important factor in Oromia and SNNPR and the second most important in Amhara and Tigray. However, the difference among the regions is not statistically significant. Lack of money to purchase inputs is also important in SNNP region, Oromia and Amhara regions whereas lack of money for non-farm expenditure (e.g. expenditure for schooling) is important in Amhara and Oromia. Regional differences are statistically significant with respect to both parameters.

Table 14: Why farmers rented-out their land?

	Tigray	Amhara	Oromia	SNNP	All	Chi-sq. value
Lack/shortage of labor (%)	69.0	76.5	23.0	17.0	37.6	43.8***
Lack of oxen/draft power (%)	57.1	35.3	47.5	35.8	45.1	5.1
Lack of money for farm inputs (%)	2.4	17.6	21.3	30.2	19.1	12.0***
Lack of money for other expenses (%)	-	17.6	16.4	5.7	9.2	10.2**
Generate more income (%)	2.4	5.9	3.3	3.8	3.5	0.5
Long distance of land from home (%)	2.4	-	-	-	0.6	3.1
Health problem (%)	2.4	-	3.3	-	1.7	2.1
Others (%)	7.1	-	3.3	20.8	9.2	12.9***

Note: Farm inputs include improved seeds and fertilizer. Other expenses include school expenses

,* show significance at 5% and 1% levelsSource: Field survey (2012)

About 72% of households have rented-in farmland. The major reason is lack/shortage of farmland (76.1%) to produce enough crops for family (Table 15). This reason is the most important in all of the study regions. However, the difference among the regions is statistically significant implying that this constraint is more pervasive in some regions (Amhara and Oromia) than others (SNNPR and Tigray). Having excess adult labor but not enough farmland appears (though distantly) as the second most important factor in explaining farmers' decision to rent-in land from others. About 3.4% of farmers associate their participation to their interest to increase their household income. This factor is again more common in some regions (SNNPR and Tigray) and others (Oromia and Amhara).

Table 15: Why farmers rented-in farm lands?

	Tigray	Amhara	Oromia	SNNP	All	ChiSq. value
Lack/shortage of land (%)	70.2	88.9	82.4	63.6	76.1	9.6**
Excess labor but not enough land (%)	19.3	11.1	4.4	20.5	13.2	8.6**
Excess oxen/draught power (%)	1.8	-	-	-	0.5	2.6
Increase household income (%)	1.8	-	10.3	6.8	5.4	6.9*
Others	7.0	-	2.9	9.1	4.9	4.6

*,** show significance at 10% and 5% levels

Source: Field survey (2012)

Table 16: Address and affiliation of the largest tenant/leaseholder of rented out farmlands

	Tigray	Amhara	Oromia	SNNP	All	Chi-sq. value
Affiliation to the largest tenant to the land lord						
Relative (%)	45.6	55.0	27.1	56.9	42.3	14.7***
Close friend (%)	14.8	20.0	15.3	22.4	17.7	1.4
Neither relative nor friend (%)	38.6	20.0	56.5	19.0	39.6	23.8***
Organization (%)	-	-	1.2	1.7	0.9	1.2
Children (%)	-	5.0%	-	-	0.5	10.0**
Address of the largest tenant						
The same Gott with landlord	64.9	78.9	34.1	68.5	54.9	25.6***
The same Kebele with landlord	29.8	21.1	35.3	22.2	29.3	3.4
The same Woreda with landlord	5.3	-	23.5	5.6	12.1	17.7***
The same Zone with landlord	-	-	2.4	-	0.9	3.1
The same region with landlord	-	-	-	3.7	0.9	6.0
Outside of the landlord's region	-	-	4.7	-	1.9	6.2

,* show significance at 5% and 1% levels

Source: Field survey (2012)

The majority of land transactions (60%) are undertaken between relatives or friends (Table 16). This is because informal land transactions require high level of trust which is built overtime after repeated interactions and such repeated interactions most likely occur between relatives and friends. However, substantial percentage of land transactions (39.9%) also occurs out of the circles of relatives and friends. Regions are significantly different with respect to the percentage of households who rent-out their land to relatives but they are not with respect to percent of household who rent/share-out land to friends. Visibly, relatives are more important in Amhara and SNNPR than Oromia as well as Tigray. In Oromia, the majority of the land transactions occur between non-relatives or non-friends indicating that rental contracts involve a broader social group.

The selection of tenants by landlords also varies between holders of land certificates and non-holders (Table 17). Most of the households without land certificate rented-out their land either to their relatives (52.6%) or to their friends (21.1%). The figures corresponding to certificate holders are lower. On the other hand, 45.1% of the second-level certificate holders and 35.5% of the first-level certificate holders made agreements with tenants who are outside of their kinship structure as well as their friendship circles.

Distance matters in land transactions in at least two ways. First, it may affect the frequency of interaction and, in turn, affect level of trust which affects decision to engage in rental agreements²⁸. Second, it determines the easiness of land operation of the land by the tenant as land is a non-mobile asset. Thus, one can expect that land rental markets involve farmers who reside within short distances from the land available for rent. Our survey results confirm this fact. Most of the participants in land rental markets reside either in the same village/*gott* (55.4%) or in the same *kebele* (28.6%) (Table 16). Only, 16% of the rental partners come from other *kebele* within the same *woreda* or beyond.

Significant regional differences are also observed with respect to the residence of rental partners. This is holds true with respect to the percent of households who rented/shared-out their land to tenants residing in the same got/village and those who did so to tenants residing in the same *woreda*. In Oromia, rental markets involve partners residing in diverse geographical locations. While the majority of the rental partners reside either in the same village or in the same *kebele*, significant percentage of them (23.8%) do not share *kebele* administration. In Amhara, nearly 80% of the participants reside within the same village/*gott* indicating that rental markets are confined to small geographical area. Similar situations are observed in Tigray and SNNPR although to a smaller extent as compared to Amhara.

The study regions are not significantly different in terms of the variables indicating kinship relationship between renting/sharecropping partners. However, the differences are significant in

²⁸ Presumably, the renter would want to be able to easily observe what the rentee is doing so he/she could take quick action in case of any negative behavior and close distance reduces the cost of observation.

some of the variables indicating residential proximity of rental partners (Table 17). The majority (i.e. 94.8%) of the tenants of non-certificate holders reside within close distances of the landlords: i.e. they reside either in the same *gott* or in the same *kebele*. Perhaps, this is because the renter would want to be able to easily observe what the rentee is doing so he/she could take quick action in case of any negative behavior and close distance reduces the cost of observation. The figures corresponding to first-level certificate holders and second-level certificate holders are lower than the figure corresponding to landholders without certificate. However, the differences among the three groups of households are not statistically significant. Rather, the three groups are significantly different in terms of the situation that whether tenants reside within the same *woreda* to the landholders. In this regard, holders of second-level certificates have shown a greater tendency to deal with tenants residing in distant places while none of those without land certificate dared to rent/share-out their land to distant partners i.e. outside of the *kebele* of the landholder.

Table 17: Participation in renting-out of land

	No certificate	First-level certificate	Second-level certificate	Chi Sq. value
Affiliation to the largest tenant to the land lord				
Relative (%)	52.6	42.7	39.6	1.1
Close friend (%)	21.1	20.0	14.3	1.2
Neither relative nor friend (%)	26.3	35.5	45.1	3.2
Organization (%)	-	0.9	1.1	0.2
Children (%)	-	0.9	-	1.0
Address of the largest tenant				
The same <i>Gott</i> with landlord	63.2	56.5	51.1	1.1
The same <i>Kebele</i> with landlord	31.6	31.5	26.1	0.72
The same <i>Woreda</i> with landlord	-	9.3	18.2	6.5**
The same <i>Zone</i> with landlord	-	0.9	1.1	0.2
The same region with landlord	5.3	-	1.1	4.9*

Outside of the landlord's region	-	1.9	2.3	0.4
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*,** show significance at 10% and 5% levels

Source: Field survey (2012)

4.7. Sustainable Natural Resource Management

Sustainable and productive land use practices constitute some of the biggest challenges to Ethiopia's effort to forge ahead with its development agenda. As discussed earlier, many studies show that improved tenure security has a positive impact on individual and communal investments in sustainable land use practices. Farmers who have more secure land rights are more likely to adopt sustainable land use practices, which eventually would result in increased agricultural productivity. In this section, we will try to summarize the main results of the survey with respect to natural resource management disaggregated by regions and status of land certification. Specifically, we will look into soil conservation practices, water harvesting and conservation, and tree planting practices.

4.7.1. Soil Conservation Practices

Farms vulnerable to soil erosion are substantial in the study areas. About 40% of the sample households indicated that their farms are located on a sloppy terrain and, hence, they are susceptible to soil erosion. In fact, there are visible regional differences. About 62% of the sample households in Tigray and 55% in Amhara indicated that at least some of farm lands are located on a sloppy terrain. The corresponding figures for Oromia and SNNPR are 29.2% and 31%, respectively. Perhaps, the results are expected given the fact that central and southern highlands are, by and large, flatter than the northern highlands of the country.

Soil conservation measures are practiced in all of the study regions. About 36% of the sample households have constructed soil conservation structures such as soil bunds, stone bunds, hedgerows, soil ditches, vegetation lines, and grass strips using their own resources (Table 18). The major soil conservation structure constructed in all of the study regions is soil bunds which has constructed by 30% of the sample households. The other soil conservation and improvement measures are less common i.e. less than 10% in all regions. Moreover, about 10% of the sample households protect and maintain soil conservation structures constructed by others (including GOs, NGOs, and CBOs).

There are significant regional variations with regards to the percentage of households who allocated some resources to construct soil conservation structures. Tigray is by far better than the other regions; about 65% of the sample households in this region have allocated own resources to construct soil conservation structures on their farmlands. Amhara region is the second with 44.6% and SNNPR is the least (19.5%). In terms of the percentage of households who protect and maintain soil conservation structures constructed by others, Amhara region is the first (37%) followed by Oromia (10.6%). The inter-regional variation is statistically significant.

Table 18: Investment in Soil Conservation Structure by region

	Tigray	Amhara	Oromia	SNNPR	All	Chi-sq./F value
Is there any soil conservation structure constructed by household's own resources? (% yes)	64.9	44.6	24.4	19.5	35.9	150***
Is there any soil conservation structure constructed by other but maintained or protected by the household? (% yes)	2.7	37.0	10.6	9.4	10.1	74.2***
Length of soil conservation structures constructed using own resources (meters)	117 (143.7)	86.1 (132.9)	20.6 (56.1)	9.8 (37.9)	49.7 (103.9)	77.1***
Length of soil conservation structures constructed with the help of others (GOs, NGOs, CBOs) but maintained and protected by the household (meters)	3.4 (25.3)	78.7 (137.8)	11.1 (44.5)	5.9 (26.8)	12.7 (54.1)	46.1***

Note: Numbers in parenthesis are standard deviations.

*** shows significance at 1% level

Source: Field survey (2012)

The average length of soil conservation structures constructed by households' own resources is about 50 meters (Table 19). However, the average length of soil conservation structures constructed by governmental or non-governmental organizations but maintained or protected by households is only 12.7 meters. This may imply that resources allocated by households on soil conservation structures are by far higher than those allocated by GOs or NGOs. The average length of conservation structures is the highest in Tigray region (117 meters) while it is the lowest in SNNPR. Amhara region is the second best with regards to the length of conservation structures constructed by households' own resources. On the other hand, Amhara region is the

first in terms of the average length of soil conservation structures constructed by GOs or NGOs but protected or maintained by households. In general, the results show that households found in Tigray and Amhara regions are better than those in the Oromia and SNNPR in terms of investments in soil conservation structures. Perhaps, this is a reflection of the degree of soil erosion problem which is generally high in the northern part of country as compared to the southern and central parts of it. The difference among the regions is statistically significant.

We have also explored whether there is any disparity among households with certificates and no certificates with regards to investments in soil conservation structures (Table 19). The results show the existence of significant differences in terms of rate of participation and intensity of participation. In terms of the rate of participation (i.e. the percentage of households who allocated resources to construct soil conservation structures), households holding second-level certificates are visibly better than those holding first-level certificate and those without certificate while there is no visible difference between the latter two categories of households. Households with certificates are better than households without certificates in terms of participation regarding the conservation structures constructed by others but maintained/protected by households. There is no visible difference between holders of first-level certificates and second-level certificates in this regard. Statistical tests show that the differences among the three categories of households are significant in terms of both the percent of households who allocated own resources for soil conservation and the percent of households who protected soil conservation structures constructed by GOs and NGOs on their farms.

On average, holders of second-level certificates have constructed 53.8 meters of soil conservation structures with their own resources which is the highest of all the three categories. This figure is closer to the figure corresponding to holders of first-level certificates but is far away from the figure corresponding to non-holders of land certificate. However, the difference among the three categories is not statistically significant. The average length of the structures constructed by others but maintained or protected by households is the highest for holders of first-level certificate. In this regard, the aggregate position of those households without land certificate is the lowest and the difference among the three categories is statistically significant.

Table 19: Investment in Soil Conservation Structure by status of land certification

	No certificate	First-level certificate	Second-level certificate	Chi-sq./F. value
Is there any soil conservation structure constructed by household's own resources? (% yes)	33.3	30.6	42.2	12.6***
Is there any soil conservation structure constructed by other but maintained or protected by the household? (% yes)	4.8	11.5	10.0	4.1
Length of soil conservation structures constructed using own resources (meters)	35.6 (64.8)	49.2 (100.7)	53.8 (114.6)	1.2
Length of soil conservation structures constructed with the help of others (GOs, NGOs, CBOs) but maintained and protected by the household (meters)	1.7 (8.2)	17.9 (68.6)	10.1 (41.8)	4.6***

*** shows significance at 1% level

Note: Numbers in brackets are standard deviations

Source: Field survey (2012)

4.7.2. Development of agricultural water resources

Water management practices are closely linked to land management and agricultural development. This calls for the necessity to integrate water management with agriculture and natural resources' management by promoting different adaptation options at grassroots level including water-harvesting technologies and more efficient water use systems. The focus of the government on irrigation and water management is high (MOFED 2010, MOFED 2006). Efforts have been made to increase the number of farmers using small scale irrigation and those practicing water conservation techniques on their farms.

About 19% of farmers reported that they use irrigation at least on part of their land. This figure is higher than the national figure indicating that the study areas are better situated in terms of utilizing water resources (CSA 2011a, CSA 2011b). SNNPR is the best in terms of the percentage of the sample households using irrigation (i.e. 27.2%) while Tigray, Amhara, and Oromia take successive ranks with percentage values of 25%, 15.8%, and 8%, respectively. The percentage of non-certificate holder households who use irrigation is about 27% which is higher than that of first-level certificate holders (13.7%) and second-level certificate holders (22.1%).

Data was collected on participation of households on three types of water conservation techniques i.e. on-farm water retention, water harvesting, hand-dug wells. Generally, the participation of households in all water conservation techniques is low (Table 20). The participation is relatively better in water harvesting i.e. 10.3% of the households participate in this activity. Those who involve in water conservation activities constructed 1-13 on-farm water retention structures (such as retention ditches), 0.5-1000 meters of water-harvesting canals, and 1-2 hand-dug wells. Amhara and Tigray are better than Oromia and SNNPR in terms of participation in on-farm water retention techniques using own resources whereas SNNPR and Tigray are better than the remaining two regions in terms of water harvesting. In terms of hand-dug water wells, Amhara is by far better than the other regions. The differences among the study regions are statistically significant regarding the percentage of households who allocated resources for agricultural water development.

Water conservation practices constructed by governmental and non-governmental organizations are not common as implied by low participation rates of the sample households. However, regional differences are statistically significant for all forms of agricultural water development except for hand-dug wells. Apparently, Tigray is better than other regions in this regard when we consider on-farm water retentions structures and water harvesting canals.

Table 20: Investment on water conservation & harvesting practices (% of households) by region

	on-farm water retention structures		water harvesting canals		Hand-dug wells	
	by own resources	by organizations	by own resources	by organizations	by own resources	by organizations
Tigray	12.8	7.9	10.2	4.1	6.0	0.4
Amhara	18.9	-	-	-	23	2.7
Oromia	3.2	0.9	1.2	2.0	1.2	1.2
SNNP	7.5	1.5	25.4	1.1	2.6	0.4
All	8.3	3.0	10.4	2.2	4.6	0.8
Chi-sq. value	29.8***	32.2***	104.2***	7.8*	69.3***	5.0

*,*** show significance at 10% and 1% levels

Source: Field survey (2012)

Table 21 shows the participation of the sample households in water conservation activities with respect to the status of land certificate levels. Results indicate that the participation is generally

low in all of the three certification levels. There are significant differences among the three categories with regards to percent of households who allocated resources for agricultural water development. However, the three categories of households are not significantly different in terms of the percentage of households who protected or maintained the structures constructed by others on their farms.

Table 21: Investment on water conservation and harvesting practices, by certification level

	On-farm water retention structures		Water harvesting canals		Hand-dug wells	
	by own resources	by organizations	by own resources	by organizations	by own resources	by organizations
No certificate	9.5	2.9	13.3	-	1.9	-
First-level certificate	10.6	3.9	5.5	2.3	6.7	0.7
Second-level certificate	5.6	2.0	14.8	2.7	3.2	1.2
Chi-sq. value	7.1**	2.9	20.7***	2.8	7.9**	1.7

,* show significance at 5% and 1% levels

Source: Field survey (2012)

4.7.3. Tree planting practices

On-farm tree planting is an important form of agro-forestry practice that can stabilize eroding landscapes and increase soil and water quality. Land certification is expected to improve smallholders' incentive for tree planning and other biological soil and water conservation and improvement practices.

Table 22 shows results related to planting of perennial crops which are expected to reduce soil erosion in addition to other benefits. About 37% of the sample households plant perennial crops of different kind during the past 24 months before the survey time. There is significant regional differences with regards to the percentage of farmers who planted perennial crops. SNNPR is apparently better than other regions in terms of the percentage of households who planted trees (70%). Perhaps, this is because of the fact that perennial crops (such as *enset* and coffee) are important crops in the selected *woredas* of SNNPR. Nearly one-half of the sample households in

Amhara region also planted perennial crops. The rate participation is relatively low in Oromia and Tigray as compared to SNNPR and Amhara.

Households were asked how many seedlings survived from the total seedlings planted in the past 24 months. According to the results, on average, about 42 seedlings survived per household while, on average, about 260 were planted during the same period. This shows a 16.2% average survival rate of seedlings which is quite low²⁹. The majority of the survived seedlings (about 98%) are seedlings of non-fruit crops or trees. The study regions are significantly different in terms of the average number of surviving seedlings. Amhara region is at the top with average figure of 173.4. SNNPR takes the next rank with the average figure of 86 seedlings. The average figures for Tigray and Oromia are quite small.

Farmers obtain seedlings through different means. The majority of the farmers (51.1%) raised seedlings by themselves while 45% of them purchased the seedlings from the market. Only 16.2% of the households obtained seedlings from various sources free of charge. The majority of households in Amhara and SNNPR raised seedlings by themselves whereas the majority of households in Tigray purchased from the market. Most of the households in Oromia obtained from different organizations free of charge. The Chi-square statistics are significant in all of the three modes of acquisition of seedlings.

²⁹ This is a speculative estimation in a sense that only some selected perennials were considered to compute the number of seedlings planted (the denominator). The figure could have been even lower had all perennials been considered.

Table 22: Planting of perennial crops/trees by region

	Plant perennial crops and trees (% yes)	Number of seedlings planted ³⁰	Number of surviving seedlings ³¹	Source of seedlings (all type) (% ³²)		
				Raised	Purchased	Gift
Tigray	28.0	38 (170)	6.3 (29.9)	41.7	70.4	3.1
Amhara	47.9	132 (618)	173.4 (605.7)	86.7	26.7	0
Oromia	16.1	12 (68)	6.7 (35.9)	19.5	33.3	64.4
SNNP	70.1	824 (2183)	86.1 (376.6)	65.6	38.5	2.2
All	37.3	261 (1235)	42.2 (302.7)	51.1	45.0	16.2
Chi-sq./F value	201.6***	28.5***	9.6***	33.2***	20.0***	100.2***

**** shows significance at 1% level

Source: Field survey (2012)

Table 23: Planting of perennial crops/trees by status of land certification

	Plant perennial crops and trees (% yes)	Number of seedlings planted ³³	Number of surviving seedlings ³⁴	Source of seedlings (all type) (% ³⁵)		
				Raised	Purchased	Gift
No certificate	59.6	488 (1175)	54.9 (398.7)	69.2	33.3	-
1st-level certificate	28.7	76(370)	35.2 (332.3)	65.0	40.9	14.5
2nd-level certificate	40.6	395(1716)	46.1 (234.4)	39.8	50.5	20.9
Chi-sq./F value	37.5***	9.1***	0.2	13.6***	3.2	7.0**

,* show significance at 5% and 1% levels

Source: Survey 2012

Results were compared across the status of land certification. In contrast to the expectation larger percentage of households without land certificate have planted more perennial crops than those with certificates of any kind (Table 23). The result may imply that households without land

³⁰ Includes only selected perennials such as coffee, hop, enset, sisal, khat, and bamboo.

³¹ Include all perennials (fruits and non-fruit type)

³² Households who didn't plant perennial crops have been excluded from computation of percentage values.

³³ Includes only selected perennials such as coffee, hop, enset, sisal, khat, and bamboo.

³⁴ Include all perennials (fruits and non-fruit type)

³⁵ Households who didn't plant perennial crops have been excluded from computation of percentage values.

certificates could plant trees on their farmlands for the sake of increasing land security anticipating that their holding would be endorsed by the government during the upcoming certification which would be implemented most likely in their area in the future³⁶. A comparison between the two categories of certificate holders show that holders of second-level certificates are better than holders of first-level certificates.

With respect to the number of surviving seedlings, there is no difference among the three categories of households. However, a closer look at the holders of land certificates shows that holders of second-level certificates are better than holders of first-level certificates. Presumably, the result indicates that holders of second-level certificates do have more incentive (arising from better tenure security) to give more time to nurture the seedlings that led to better survival rate among the planted seedlings.

The three groups of households are also different in terms of the sources of seedlings. The test statistic is significant for those raising seedlings and for those who obtained the seedlings free of charge. Most of the households without certificates and those with first-level certificates could raise the seedlings whereas about one-half of second-level certificate holders purchased the seedlings from the market. The percentage of households who obtained seedlings from NGOs or GOs is either small or null among the three categories but the figure is higher for holders of second-level certificates.

Trees are planted mostly on backyard lands (39.9%) or on boundaries of crop lands (38.6%). Agro-forestry is also exercised by about 14% of the households. There are visible regional differences with regards to the location of tree planting. In Tigray, backyard farms and boundaries of croplands are, by and large, equally important but agro-forestry is more important as compared other regions. Most of the households (58.1%) prefer boundaries of croplands to plant trees in Amhara whereas, in Oromia, the majority (62.5%) prefer backyard sites. In SNNPR, boundaries of croplands are preferred by about 43% of the households to plant trees while backyard plots are also important places but to a lower extent. With respect to the status of

³⁶These descriptive results should be cautiously interpreted since spurious relationships are most likely to be encountered in the absence of systematic controlling for potential variables.

land certification variations exist but there is no visible pattern that could help differentiate holders of land certificates from non-holders. Substantial percentages of non-holders of land certificate planted perennial crops/trees on boundaries of crops lands and/or backyard plots and substantial proportions of certificate holders did the same. The only notable difference is that the percentage of second-level certificate holders who planted perennial crops/trees on backyard plots is greater than that of first-level certificate holders. Presumably, second-level certificate holders plant more in backyards (than on boundaries) because trees serve a different function for them since they have a better sense of security than do first-level certificate holders.

4.8. Agricultural Production and Marketing

4.8.1. Use of farm inputs and access to credit

Land reform in the form of registration of holdings and granting use-right certificates is expected to improve tenure security and the use of modern farm inputs and productivity among small farmers (Feder et al. 1988). Nearly three-quarters of the sample households use chemical fertilizers (DAP and Urea) to produce crops (Table 24). The percentage of farmers using organic fertilizers is also high (i.e. 61.7%). The study regions are significantly different from each other in terms of the proportions of farm households using chemical fertilizers. Amhara ranks first with 90% of the sample households using chemical fertilizers while Oromia is the last with 67.8%. The difference among regions is also significant with regards to the percentage of households using organic fertilizers. In this regard, SNNPR ranks first with 82% of users and Amhara ranks the last with 26.3%.

Improved seeds are used by about 46% of the sample households. There is significant variation among the study regions. In this regard, Amhara ranks first by 61.1% of the users while Oromia is the last with 24.5%. In general, the percentages of farmers using improved crop varieties in the target *woredas* of the study regions are high as compared to the national figures which was 14.7% in 2010/11 main cropping season (CSA 2011a, CSA 2011b).

Table 24: Percentage of input users by region

	Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
Do you use chemical fertilizers? (%yes)	70.7	90.8	67.8	81.7	74.4	27.9***
Do you use organic fertilizers? (%yes)	48.1	26.3	64.0	82.1	61.7	30.5***
Do you use improved seeds? (% yes)	54.7	61.1	24.5	59.6	45.8	2.9*

*,*** show significance at 10% and 1% levels

Source: Field survey (2012)

Table 25: Percentage of input users, by type of land certificate

	No certificate	1st certificate level	2nd certificate level	Chi-sq. value
Do use chemical fertilizers? (%yes)	78.1	74.1	73.7	0.9
Do use organic fertilizers? (%yes)	71.4	54.6	66.7	0.9
Do you use improved seeds? (% yes)	59.6	49.0	38.8	0.5

Source: Field survey (2012)

There is no significant difference between holders of land certificates (both first-level and second-level) and those without certificate with regards to the percentage of households using chemical fertilizers although the non-certificate holders are slightly better (Table 25). The statistical test results hold the same for organic fertilizers and improved seeds.

Table 26 shows the amount of input used per hectare of cultivated land by region. The sample households use about 94 kgs/ha of chemical fertilizers, 678 kg/ha of organic fertilizers, and 1.29 lit/ha of pesticides. The use of inorganic fertilizers varies between 66 kg/ha in Oromia and 270 kg/ha in Amhara region, respectively. The use of inorganic fertilizers is the highest in Oromia and the lowest in Amhara. First-level certificate holders, second-level certificate holders, and those without certificate have been compared with respect to the amount of the three types of

inputs considered above. However, there is no significant difference among the three categories of farmers (Table 27).

Table 26: Rate of application of farm inputs, by region

	Tigray	Amhara	Oromia	SNNP	All	F-value
Chemical fertilizer use – (kg/ha)	69.5	269.5	66.0	102.3	93.8	58.3***
Organic fertilizer use – (kg/ha)	150.5	434.6	1053.8	745.4	677.9	11.5***

*** indicates level of statistical significance at 1%.

Source: Field survey (2012)

Table 27: Rate of application of farm inputs, by type of land certificate

	No certificate	1st level certificate	2nd level certificate	F-value
Chemical fertilizer use – (kg/ha)	83	100	91	0.81
Organic fertilizer use – (kg/ha)	546	433	952	7.7***

***significant at 1% level

Source: Field survey (2012)

Credit is an important factor limiting agricultural production because of the fact that smallholder farmers usually face shortages of financial resources to purchase inputs. Farmers in all of our study regions borrowed money for purchase of farm inputs within two years before the survey time (i.e. February 2010-January 2012). However, the percentage of farmers who could borrow from different sources is unexpectedly small (i.e. 15.5%) (Table 28). A relatively high percentage of farmers (37%) could get credit in Amhara region. The figure is quite small in SNNPR (i.e. only 3.7%)³⁷. Holders of land certificates had apparently better access to credit than those without land certificates. However, chi-square test shows that the difference among the three categories is not statistically significant.

The mean amount of credit per household is 309 birr. Similarly, there are regional differences with regard to amount of credit. The amount is the highest in Amhara region and the lowest in SNNPR. First-level certificate holders borrowed the highest amount and those without certificates borrowed the least amount. First-level certificate holders borrowed significantly higher amount of credit than second-level certificate holders (Table 29).

³⁷ The selected areas in SNNPR are growers of perennial crops (such as *enset* and *t'chat*) which might have contributed to low rate of credit use. As a tradition, farm inputs (for which the credit is used) are mainly applied on grain crops, mainly cereals.

Table 28: Use of credit, by region

		Tigray	Amhara	Oromia	SNNP	All	F/chi-sq. value
Credit taken for farming (Br)		393	1750	247	29	309	64.3***
Credit for farming during last season (% borrowed)		26.3	36.8	11.7	3.7	15.5	82.1***
Source of credit (% of all sources)	Government	62.3	0	5.0	0	31.5	59.1***
	NGOs	7.2	0	7.5	0	5.6	2.6
	Credit and saving associations	8.7	96.4	87.5	16.7	48.3	96.3***
	Private lenders (including relatives/friends)	10.1	3.6	0	83.3	9.1	45.1***
	Cooperatives	11.6	0	0	0	5.6	9.1**

,* show significance at 5% and 1% levels.

Source: Field survey (2012)

Table 29: Use of credit, by type of land certificate

		No certificate	1st level certificate	2nd level certificate	F/Chi-sq. value
Credit taken for farming (Br)		99	411	262	6.0***
Percent borrowed last year		10.5	17.2	15.1	3.0
Source of credit (% of all sources)	Government (i.e. credit from state owned banks)	60.0	21.9	38.3	8.1**
	NGOs	0	2.7	10.0	3.9
	Credit & saving associations	20.0	58.9	40.0	8.1**
	Private lenders (relatives/friends)	10.0	15.1	1.7	7.2
	Cooperatives	10.0	1.4	10.0	5.0*

*,** & *** show significance at 10%, 5% and 1% respectively.

Source: Survey 2012

Those who had access to credit could borrow from various sources. However, credit and saving associations are the dominant source of credit (48.3%) while government is the second important source. There are regional variations, however, in terms of the dominant sources (31.5%). In Tigray, the majority of credit users take from the government (most probably from Commercial Bank of Ethiopia) whereas, in Amhara and Oromia, credit and saving associations are the dominant sources of credit. In SNNPR, most of the borrowers do not have access to institutional credit but receive the credit from private lenders. In all case, no borrower took the credit directly from a formal bank. Most of holders of first-level certificates receive credit from saving and credit associations whereas most of the borrowers without certificate take the loan from the government. The result vis-a-vis the status of land certification is influenced by regional

variation and, hence, if regional variation is controlled the difference among the three categories of households may vanish at all which, in turn, may imply that the relationship between tenure security and access to credit is not strong.

4.8.2. Productivity

Two type of productivity indicators were computed i.e. land productivity and labor productivity. Land productivity was measured in terms of gross margin (value of crops produced) per hectare of cultivated land whereas labor productivity was measured in terms of gross-margin per man-equivalent³⁸. The average land productivity is about 19,000 birr/ha whereas the average labor productivity is about 10,000 birr/man equivalent (Table 30). There is significant difference among regions in terms of labor productivity. Oromia is with the highest figure in terms of labor productivity and SNNPR is with the lowest figure. The difference among regions is not statistically significant in terms of land productivity. However, a disaggregated analysis by crop category shows that regions are significantly different with respect to land productivity for cereals, oil seeds, and fruits, vegetables and root crops produced (Table 31). In terms of cereals Amhara region is the best while in terms of fruits, vegetables and root crops Tigray is the best. In terms of oilseeds, Tigray and Amhara are better than Oromia and SNNPR. Furthermore, there is a significant difference among the study regions in terms of labor productivity. In this regard, Oromia and Tigray are visibly better than SNNPR and Amhara region.

Table 30: Land and labor productivities

	Tigray	Amhara	Oromia	SNNP	All	F-value
Land productivity (Br./ha)	24,475	21,974	19,149	16,941	19,077	1.81
Labor productivity (Br./ME)	10,984	7,790	11,280	4,546	10,293	2.81**

** indicates level of statistical significance at 5%.

Source: Field survey (2012)

Table 31. Land productivity (gross income/ha) by crop type

	Tigray	Amhara	Oromia	SNNP	All	F-value
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³⁸The total available labor was derived from the total labor force of the household. It was computed based on Storck et al. (1991, see Mulugeta Arega (2009). The following labor conversion factors were used to compute man-equivalent: <10 years 0, 0; 10-14 years 0.35, 0.35; 15-50 years 1.00, 0.80; >50 years 0.55, 0.50 (first figure for male, second one for female).

Cereals	4,287	7,221	3,620	2,237	3,919	18.8***
Pulses	1,665	2,165	3,789	1,264	2,907	0.23
Oil seeds	4,443	4,678	448	123	4,319	2.89**
Fruits, vegetables & root crops	6,550	678	2,571	2,516	3,343	11.9***
Other cash crops ³⁹	11,269	12,892	15,615	16,029	13,962	1.72

** & *** indicate levels of statistical significance at 5% and 1% respectively.

Source: Field survey (2012)

There is no significant difference between certificate holders and non-holders in terms of land productivity (Table 32). A separate comparison of second-level certificate holders and first-level certificate holders also show a similar result. However, there is a slight difference between certificate holders and non-certificate holders with regards to labor productivity. In this regard, certificate holders are better than those without certificates.

Table 32: Land productivity and labor productivities, by certificate ownership

	No certificate	First-level certificate	Second-level Certificate	t-value	F value
Land productivity (Br./ha)	14,184	18,965	16,742	1.35	0.71
Labor productivity (Br./ME)	6,221	11,796	8,155	2.13*	1.02

*indicates level of statistical significance at 10%.

Note: t-value statistic compares holders of land certificate and non-holders.

Source: Field survey (2012)

4.8.3. Output marketing and degree of commercialization

From long-term perspective, greater tenure security is expected to enhance farmers' investment on their farms and increase their participation in agricultural output marketing. In this section we present descriptive results on farmers' participation in output marketing as sellers of different crops. Moreover, we present the degree of commercialization of smallholders' production in the study regions.

As shown in Table 33, there is statistically significant difference in participation of output markets across the surveyed regions and crop types. An average farmer in SNNP region sold

³⁹ Important cash crops are coffee, t'chat, pepper, and hop (Gesho).

crops worth 5,200 Birr which is three times lower than the average farmer in Tigray region. Oilseeds, fruits and vegetables are the major contributors for significantly high value of crop sold in Tigray region. The average crop incomes in Oromia and Amhara regions are, by and large, similar i.e. about 9,000 Birr. The major cash crops in Amhara and Oromia regions are cereals and vegetables, respectively.

Table 33. Marketing and commercialization in surveyed regions

		Tigray	Amhara	Oromia	SNNP	All	F-value
Marketing – value of crop sold	Cereals	2,144	4,951	2,666	1,562	2,518	19.9***
	Pulses	1,424	184	2,052	1,356	1,786	5.32***
	Oil seeds	4,343	3,983	280	200	4,252	2.15*
	Fruits, vegetables & root crops	9,234	204	4,287	2,084	3,503	5.96***
	Other cash crops	4,723	5,337	8,067	7,001	5,958	1.82
	All crops	21,868	14,659	17,352	12,203	18,017	5.02***
Commercialization – percent of value of crop sold as value produced (%)	Cereals	56	41	41	55	48	25.85***
	Pulses	62	33	79	66	73	13.51***
	Oil seeds	96	90	50	77	95	10.36***
	Fruits, vegetables & root crops	78	35	78	78	77	5.27**
	Other cash crops	57	43	77	96	73	---
	All crops	70	47	54	73	60	---

* & *** indicate level of statistical significance at 10% and 1% respectively.

-- F/t-value could not be computed because of small number of observations

Source: Survey 2012

The degree of farmers' commercialization has also been assessed. It has been proxied by the value of crop sold as a percent of the value of total crop produced. The most commercialized crops are oil-crops (95%) followed by fruits, vegetables and root crops (77%). Cereals are the least commercialized ones (48%). The relatively low commercialization index for cereals is expected because cereals are staple crops in many areas of Ethiopia.

The study regions vary in terms of the degree of commercialization (Table 34). Cereals are the most commercialized in Tigray and SNNPR whereas pulses are the most commercialized in Oromia. Oil crops are the most commercialized in Tigray as well as Amhara region. Fruit, vegetables and root crops are equally and highly commercialized in all of the regions except in Amhara region where the figure is substantially smaller.

Table 34: Marketing and commercialization in surveyed regions, by status of land certification

		No certificate	First-level certificate	Second-level Certificate	t-value	F-value
Marketing – value of crop sold	Cereals	1,868	2,605	2,483	1.62*	2.91*
	Pulses	1,275	1,735	1,841	1.43	0.16
	Oil seeds	2,665	4,471	2,661	2.28**	3.58**
	Fruits, vegetables & root crops	4,079	3,726	3,142	0.56	0.26
	Other cash crops	6,041	4,218	7,576	1.36-	0.29
	All crops	15,928	16,755	17,703	1.21	2.86*
Commercialization – percent of value of crop sold as value produced	Cereals	55	50	43	2.63***	3.89**
	Pulses	68	70	76	0.96	3.29*
	Oil seeds	100	96	76	1.46	7.03***
	Fruits, vegetables & root crops	79	71	78	0.98	0.67
	Other cash crops	83	56	84	--	--
	All crops	75	49	70	--	--

* & ** indicate level of statistical significance at 10% and 5%, respectively.

Note: t-value statistic compares holders of land certificate and non-holders.

-- F/t-value could not be computed because of small number of observations

Source: survey 2012

Participation in output market is significantly different among farmers who took part in the land certification program and those who did not. Households who received their first-level certificate sold on average 25% more crops (in value terms) than non-certificate holders whereas second-level certificate holders are not different from non-holders. A more disaggregated analysis shows that first-level certificate holders are better than (significantly different from) non-certificate holders (as well second-level certificate holders) in terms of the share of produce they sold within the categories of cereals, and fruits, vegetables and root crops. In terms of commercialization, farmers without certificate were found to operate at higher level of commercialization than certificate holders⁴⁰.

⁴⁰ This shows the problem of measuring commercialization in terms of percent of total value of output sold (to value of output produced). According to this definition, a farmer who produced 50 quintals of cereals and sold 15 quintal of this operate at lower commercial level than a farmer who produce 10 quintals of cereals but sold 5 quintals.

4.9.Land Related Disputes

Land is the major asset of peasant households while it is also the main source of both conflictive and cooperative interactions among them. Land was the major cause of rural upheaval against the Ethiopian government during the Imperial era. In this section, we will summarize the results of the survey in relation to inter-personal and inter-household land related disputes.

About 17% of the sample households were involved in at least one land related dispute in the two years before the survey time (Table 35). The maximum number of disputes encountered was 6 per household. There is a significant regional variation with regard to percentage of households involved in land related disputes. Land related disputes are relatively high in Amhara and Tigray and low in SNNPR and Oromia. On the other hand, conflicts are relatively high among holders of first-level certificates as compared to the other groups. The higher incidence of dispute among holders of first-level certificate might have arisen from lower precision during border demarcation and possible procedural flaws as this was the first experience for local land administration committees. For instance, Holden and Tefera (2008) reported that about 38% of the sample households in their study considered there to be a need for a new land demarcation to make plot borders clearer.

There are several causes of the disputes which include: land claims by non-family members, land claims following divorce, land claims related to inheritance, boundary encroachment, disputes that arise from exchange of plots of land, disputes that arise in relation to access to road, disputes that arise in relation to drainage, sharecropping and rental matters, and claims by *kebele* considering the land belongs to the government. However, the most common one is boundary encroachment (58.8%) which is distantly followed by land claims by non-family members (18.2%). While boundary encroachment is the major cause of dispute in all of the study regions, its share is the highest in SNNPR as compared to the other regions. Inter-regional differences are statistically significant with regards to some causes of land-related disputes such as conflicting land claims by non-family members and conflicting land claims following divorce.

Table 35: Involvement in land related disputes, by region

	Tigray	Amhara	Oromia	SNNPR	All	Chi-sq./F value
Did your household involve in any land related dispute, during the last two years? (%yes)	22.9	23.7	15.2	12.7	17.3	13.1***
Type of the most serious land related dispute						
conflicting land claims by non-family members	13.1	11.1	30.8	11.8	18.2	8.1**
conflicting land claims following divorce	1.6	11.1	1.9	-	2.4	6.8*
conflicting land claims related to inheritance	3.3	11.1	3.8	8.8	5.5	2.6
Boundary / encroachment matters	55.7	61.1	53.8	70.6	58.8	2.8
Conflict that arise from exchange of plots of land	1.6	-	3.8	2.9	2.4	1.1
Conflict related to access to road	19.7	-	-	5.9	8.5	16.6
Conflict related to water (flood) transfer	4.9	-	3.8	-	3.0	2.5
Sharecropping and rental matters	-	5.6	-	-	0.6	8.2**
Claims by <i>kebele</i> considering the land belongs to the government	-	-	1.9	-	0.6	2.2
Was the dispute resolved? (% yes)	82.0	83.3	69.2	50.0	71.5	12.4***
How was this dispute finally resolved?						
Formal court	8.2	46.7	16.7	-	14.5	17.1***
<i>Shimaglie</i> , i.e., Elders' council	53.1	46.7	41.7	52.9	48.7	1.2
Family's or kin-group's internal mechanism	6.1	-	2.8	23.5	6.8	9.5**
<i>kebele/woreda</i> administration	32.7	6.7	38.9	23.5	29.9	5.8
For how long did dispute settlement last? (weeks)	21.7	23.1	17.1	14.9	19.4	0.3
Are you satisfied with the decisions made to settle the disputes? (%yes)	80.0	93.8	76.3	94.1	82.6	4.2

,* show significance at 5% and 1% levels

Source: Field survey (2012)

Most of the land related disputes were resolved before the survey time. However, substantial percentage of the respondents (28.5%) are waiting for resolution. There is significant regional variation with regards to the percentage of respondents who could resolve their disputes. The percentage figures are high in Tigray and Amhara regions as compared to SNNPR and Oromia. Dispute resolution took on average about 19 weeks (i.e. nearly 5 months). The length of dispute resolution is relatively short in SNNPR and Oromia as compared to Amhara and Tigray. The results indicate that Amhara and Tigray are better in terms of the percentage of disputes resolved during the survey time whereas SNNPR and Oromia are better in terms of the efficiency of dispute resolution.

Various dispute resolution mechanisms are applied in the study areas which include formal courts, councils of elders (*Shimagles*), relatives, and *kebele/woreda* land administrations. Generally speaking, the practice of using formal legal system to resolve land related disputes is quite low (14.5%). Rather, elders' councils are commonly used (48.7%). To some extent, dispute cases are taken to *kebele/woreda* land administrations. However, there are regional differences in this regard. Formal courts are used as much as elders' councils in Amhara region while the proportions of farmers using *kebele/woreda* administrations in Oromia is, by and large, similar to those using elders' councils. Moreover, relatives/families are important players in dispute resolution in SNNPR while their role is small in other regions.

Satisfaction of farmers on decision made on dispute settlement is very important for sound relationship of the farmers. Those who could settle their disputes with others were asked whether they were satisfied by the solution. The majority of the respondents (82.6%) replied that they were satisfied by the solutions. However, there are differences among the study regions in this regard. Relatively high percentage of the respondents in Amhara and SNNPR were satisfied by the solutions as compared to those in Oromia and Tigray.

Households within the three status of land certification were compared vis-a-vis land related disputes. Results are reported in Table 36. The difference is statistically significant with respect

to rate of involvement in land related disputes within 24 months before the survey time. The highest rate (i.e. 21.1%) was computed for holders of first-level certificate.

Table 36: Involvement in land related disputes, by status of land certification

	No certificate	First-level certificate	Second-level certificate	Chi-sq./F value
Did your household involve in any land related dispute, during the last two years? (%yes)	10.5	21.1	15.1	9.2***
Type of the most serious land related dispute				
conflicting land claims by non-family members	9.1	14.1	25.8	4.0
conflicting land claims following divorce	0.0	3.3	1.6	0.7
conflicting land claims related to inheritance	0.0	5.4	6.5	0.8
Boundary / encroachment matters	81.8	54.3	61.3	3.3
Conflict that arise from exchange of plots of land	0.0	3.3	1.6	0.7
Conflict that arise in relation to access to road	9.1	13.0	1.6	6.2**
Conflict related to water (flood) transfer	0.0	4.3	1.6	1.3
Sharecropping and rental matters	0.0	1.1	0.0	0.8
Claims by <i>kebele</i> considering the land belongs to the government	0.0	1.1	0.0	0.8
Was the dispute resolved? (% yes)	54.5	15.2	43.5	18.5***
How was this dispute finally resolved?				
Formal court	0.0	15.6	14.3	0.9
<i>Shimaglie</i> , i.e., Elders' council	60.0	48.1	48.6	0.3
Family's or kin-group's internal mechanism	20.0	5.2	8.6	1.8
<i>kebele/woreda</i> administration/land administration	20.0	31.2	28.6	0.3
For how long did dispute settlement last? (weeks)	54.0	15.0	24.0	3.3**
Are you satisfied with the decisions made to settle the disputes? (%yes)	100.0	86.1	73.0	4.1**

,* show significance at 5% and 1% levels

Source: Field survey (2012)

The three categories of households are similar with respect to their perception of the most serious type of land related dispute. The exception is for conflicts related to access to road. In this regard, the difference of the response rate among the three categories of households is statistically significant at 5% level. The percent of households who considered conflicts related to access to road as the most serious type of dispute among first-level certificate holder is relatively high as compared to holders of second-level certificates as well as to those without land certificates. The three categories are also significantly different in terms of the rate of dispute resolution. The percentage of households who could resolve their dispute with others is the highest for those without certificate (54.5%) and lowest for those with first-level certificate (15.2%). However, the length of time for dispute settlement is the shortest for households with first-level certificate and the longest for households without certificates. The variation of time length for dispute settlement among the three categories of households is statistically significant. The percent of households who were satisfied by the decision of juries during conflict resolution varies from 100% for non-certificate holders 73% of holders of second-level certificate. The difference is statistically significant.

4.10. Gender aspects of land registration

In this section, we look into gender aspects of land registration as perceived by household heads and wives. This will be done in two sub-sections. In Sub-section 4.10.1, we analyze the current status of women as wives (but not as household heads) on land access and ownership and how the gender aspect was implemented in the process of land certification in the four regions. The analysis is based on the data directly collected from housewives by administering a separate questionnaire. In Sub-section 4.10.2, we compare and contrast female-headed households and male-headed households with respect to some selected variables such as awareness on land laws, participation in informal land markets, use of farm inputs and technologies, natural resource management, and access to credit. The purpose here is to shade light on the differences between male and female farmers taken as heads of households but not as husbands and wives.

4.10.1. The status of women as wives

4.10.1.1. Women Land possession

The majority of women possess land (Table 37). The percentage of first wives who possess land in their names is by far higher than that of second wives in polygamous families. The study regions vary in terms of the percentage of women who possess land in their names. The figure is the highest in Oromia (93.2%) and the lowest in Tigray (53.3%) while SNNPR and Amhara lie in between with 85.7% and 78.8%, respectively. For second wives, SNNPR is better than Oromia.

Possession of land has been asserted by land certificates and hence, 90.6% of the first wives and 91.4% of the second wives who possess land have received certificates for their land. In this regard, almost all first wives who possess land in their name received land certificates in Oromia and Amhara. In Tigray and SNNPR the percentage figures are relatively small. For second wives, Oromia is better than SNNPR in terms of the distribution of land certificates to women.

Table 37: Land Possession and Certificate⁴¹

		Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
Do you possess land in your name (% yes)	Wife 1	53.3	78.8	93.2	85.7	80.0	113.6***
	Wife 2	-	-	63.6	71.0	68.6	0.6
Do you have certificate? (% yes)	Wife 1	80.2	97.6	99.2	83.7	90.6	47.2***
	Wife 2	-	-	95.2	89.8	91.4	0.6

*** shows significance at 1% level

Source: Field survey (2012)

The respondents indicated that women (as wives) could possess land certificates of different type (Table 38). About 44% of first wives and 39% of second wives have first-level certificates. The figures vary across regions i.e. Amhara region is by far better than all other study regions in terms of the percentage of first wives who received first-level certificate (i.e. 100%). SNNPR is better than Oromia in terms of the percentage of second wives who possess first-level certificate.

⁴¹ The absence of responses for Wife 2 in Amhara and Tigray regions doesn't mean that the number of "yes" responses for Wife 2 is zero; it rather signifies the absence of Wife 2 in these regions. Perhaps, this is because of the fact that Amhara and Tigray regions are predominantly Christian and hence polygamy is not exercised.

The percentage of women who possess second-level certificate is higher than those who possess first-level certificate only. This is actually the case for both first wives and second wives. The percentage of women who received second-level certificate ranges from about 57% (for first wives in Oromia and Tigray) to 80% (for second wives in Oromia) (Table 35).

Table 38: Type of Certificate and forms of issuance

		Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
Type of certificate							
First level	Wife 1	41.6	100	40.4	37.6	44.2	55.1***
	Wife 2	-	-	20	47.7	39.1	4.4**
Second level	Wife 1	57.2	-	57.1	61.1	54.1	51.8***
	Wife 2	-	-	80	52.2	60.9	4.4**
I don't know	Wife 1	1.3	-	2.4	1.2	1.7	1.9
	Wife 2	-	-	-	-	-	
Form issuance of the certificate							
Jointly with husband	Wife 1	63.6	97.5	93.4	99.4	91.3	92.0***
	Wife 2	-	-	80.0	88.6	85.9	0.8
Alone	Wife 1	35.1	2.5	3.3	0.4	7.0	110.8***
	Wife 2	-	-	20.0	11.4	14.1	0.8
I don't know	Wife 1	1.3	-	3.3	-	1.7	7.4*
	Wife 2	-	-	-	-	-	-

*, **, *** show significance at 10%, 5%, and 1% levels

Source: Field survey (2012)

Land certificates have been given jointly for husbands and wives in most of the cases. About 91% of first wives and about 86% of the second wives hold joint certificates with their husbands. The percentage of second wives who were given certificates alone is 14% which is higher than the figure corresponding to first wives (7%). The figure corresponding to the second wives is higher perhaps because, in some polygamous families where wives live independently on their own land, separate certificates were given to second wives but husbands were registered as one

member of the family. The percentage of second wives who obtained certificates alone is higher for Oromia (17%) than SNNPR (10.4%).

4.10.1.2. Women's participation in land certification process

Women were asked whether they knew about the process of land certification which was taking place in their *kebele*. The results indicate that women are adequately aware of the process i.e. about 79% of the first wives and about 81% of the second wives are informed about the process (Table 39). The rate of awareness is, by and large, the same in all of the study regions except Tigray where only about 66% of the sample women are aware of the process. Although, women's awareness about the process is generally high, their participation on formal discussions about the issue is very low. Only 33% of the first wives and 38.9% of the second wives participated in meetings arranged to discuss about the process. Participation of women in formal meetings is relatively high in Amhara region (63.5%) as compared to other regions whereas Oromia is the least in this regard. The participation of second wives in formal discussions is a bit higher than the first wives. Perhaps, this is for the reason that second wives in some polygamous families are semi-independent in terms of land holding and ownership of other resources and hence they are considered as de facto household heads by *kebele* administrators while first wives are usually supposed to be represented by their husbands in formal meetings.

Most of women respondents were not consulted when their land was measured for registrations. Only 40.7% of the first wives and 39.5% of the second wives had their own say. Although they were around their farm lands during the measurement, 45.5% of the first wives and 41.9% of the second wives were not given the chance to present their views. The remaining 14.1% of the first wives and 18.6% of the second wives were not around during the measurement. There is significant variation among the study regions.

Land administration committees were established at *kebele* level to implement the land registration. Initially, it was planned to include two women in land administration committees. However, the participation of women in land registration program was low as committee members as indicated during group discussions.

Table 39: Awareness and Participation of Women in Land Certification Process

		Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
Do you know about the process of land registration and title certification that is going-on / took place in your <i>kebele</i> ? (% yes)	Wife 1	66.1	82.7	82.3	81.0	77.8	19.2***
	Wife 2	-	-	78.8	82.1	80.9	0.2
Did you participate in the <i>kebele</i> meetings that discuss about the process of land registration and title certification in your <i>kebele</i> ? (%yes)	Wife 1	38.9	63.5	19.6	37.4	33.0	47.9***
	Wife 2	-	-	15.2	52.6	38.9	12.4***
Were you present/consulted by the surveyors when they came to measure your land?							
Yes, I was present and consulted	Wife 1	44.9	38.5	32.7	48.7	40.7	13.2***
	Wife 2	-	-	21.9	50.0	39.5	6.6***
Yes, I was present but not consulted	Wife 1	43.0	26.9	53.5	40.8	45.2	15.9
	Wife 2	-	-	56.3	33.3	41.9	4.3**
No, I was not there	Wife 1	12.0	34.6	13.8	10.5	14.1	20.8***
	Wife 2	-	-	21.9	16.7	18.6	0.4

,* show statistical significance at 5% and 1% levels

Source: Field survey (2012)

4.10.1.3. Women perception on land rights and impacts of the land certification program

While the role of informal institutions is substantial to protect rights in many rural areas of Ethiopia, land rights are increasingly formalized in recent years. The implementation of rounds of land registration programs is an apt example for this. The importance of the formal land rights depends on the degree of trust of the public on these institutions. Trust requires awareness of the land related institutions and perceptions about the capability (as well as fairness) of formal authorities in enforcing rights.

Responses were gathered from the women interviewees about their awareness of existing land laws and their perception on the capability of existing institutions to enforce the rights of women. The result is not good regarding the level of awareness on the land laws: only 41% of the first

wives and 39.6% of second wives know and adequately understand the existing land laws that affect their lives as farmers. However, a larger proportion of both first wives (69.3%) and second wives (71.6%) believe that the existing administrative/ judiciary institutions are capable of enforcing the land laws. Moreover, about 74% of first wives and 79% of second wives believe that the existing laws can adequately protect the rights of women.

Table 40 displays results on women's perceptions about security of their land rights. The great majority of the first wives (93.6%) and second wives (89.9%) feel that they were better secured of their land possession after the registration program. While regional differences are not substantial, the percentage figure corresponding to first wives is the largest in Amhara region. For second wives, SNNPR is better than Oromia.

The respondents were asked to provide their perception on the effects of land certification program on women. About 58% of first wives and 61% of second wives believe that the program would have positive impacts on women since it enhances women's bargaining power within the household and increases their economic independence (Table 41). About a quarter of the first wives and nearly one-fifth of second wives believe that it wouldn't have any effect on women. Moreover, about one-fifth of both first wives and second wives do not have any imagination about the impacts of the land certification program. The proportions of first wives who have positive expectations from the land certification program are relatively high in Tigray and Amhara regions as compared to Oromia and SNNPR. The difference among study regions is statistically significant. Regarding second wives, SNNPR is apparently better than Oromia in terms of positive expectations but their difference is not statistically significant.

Table 40: Women's perception on land related institutions and tenure security

		Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
Do you understand the existing land laws that affect your life as farming household? (% yes)	Wife1	57.5	26.9	34.2	40.9	41.6	29.4***
	Wife2	-	-	18.2	50.0	39.6	9.4***
Do you think that the laws adequately protect land rights of women? (% yes)	Wife1	74.9	55.8	75.9	76.4	74.4	10.3***
	Wife2	-	-	84.8	76.1	79.0	1.0
Do you think that administrative/ judiciary institutions are capable of enforcing land laws? (% yes)	Wife1	76.5	48.1	70.3	67.5	69.3	15.9***
	Wife2	-	-	78.8	68.1	71.6	1.2
What is your perception about tenure security after land registration?							
Feel better secured	Wife1	93.6	97.9	91.2	95.9	93.6	5.5
	Wife2	-	-	87.0	91.9	89.9	0.4
No difference	Wife1	1.3	1.9	5.0	2.9	3.3	4.7
	Wife2	-	-	6.5	6.1	6.3	0.0
I don't know	Wife1	5.1	-	3.8	1.2	3.1	6.0
	Wife2	-	-	6.5	2.0	3.8	1.0
How do you perceive the effect of land certification on women?							
It will have positive impact	Wife1	73.1	63.5	48.6	53.7	57.5	28.4***
	Wife2	-	-	54.5	64.9	61.0	0.9
It will have no effect on women	Wife1	8.4	28.8	30.6	29.3	24.4	33.6***
	Wife2	-	-	18.2	19.3	18.9	0.0
I do not know about its effect yet	Wife1	18.4	7.7	20.8	17.1	18.1	5.2
	Wife2	-	-	27.3	15.8	20.0	1.7

*** shows statistical significance at 1% level

Source: Field survey (2012)

Women usually participate in land rental markets as renters. This is mainly because of cultural barriers to cultivate land on their own and because of resource limitations (e.g. shortage of oxen as draft power and lack of money to purchase inputs). However, they are not beneficiaries from their land to the extent they deserve. Rather, they often lose their advantages since they are less informed about the existing modalities of rental agreements and administrative supports.

In view of these problems women were asked to provide their views on the possible impacts of land certification program on their participation in land rental markets. The results are displayed in Table 41. The majority of both first wives (62.3%) and second wives (57.1%) responded that land certification would encourage them to rent-out their land. In regards to first wives, SNNPR and Oromia are better than Tigray and Amhara regions. SNNPR is better than Oromia in regards to second wives. Moreover, about 51% of first wives and 53.4% of second wives believe that the certificate would enhance their capability to negotiate with rental partners. The percentage of wives who expect positive impacts of land certification on bargaining power of women is the highest in Tigray and the least in Amhara. However, the difference among the study regions is not statistically significant.

Table 41: Perception of women on the impacts of land registration on land rental markets

		Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
If you have land in your name and you have/ get certificate of possession for it, do you think that the certificate will encourage you more to rent -OUT your plot of land? (% yes)	Wife1	53.2	51.0	65.5	68.5	62.3	13.0***
	Wife2	-	-	37.5	69.2	57.1	8.1***
Will /has the land certification have any impact on your ability to negotiate whether or not you participate in land rental market? (% yes)	Wife1	63.4	44.2	43.6	52.0	51.1	17.7
	Wife2	-	-	42.4	60.0	53.4	2.5

*** shows statistical significance at 1% level

Source: Field survey (2012)

4.10.1.4. Land related dispute and position of women

Land is a crucial asset in the rural community and, hence, land related disputes usually involve not only men but also women. About 8.2% of the first wives and 4.9% of second in our sample experienced land related disputes (Table 42). Out of the women who encountered land related dispute 11.9% have lost their land due to the disputes. The major cause of dispute for those who lost their land is boundary conflict (28.6%).

The sample women were also asked on their perception on the cause of disputes in their *kebele*, although they didn't face any dispute. The most common land related dispute for women is land claim following divorce. This accounts for 54% of the total responses. The second most common cause is conflicting land claims following inheritance that accounts for 24%. In terms of the factors causing land related dispute to women, there is no visible difference between polygamous and monogamous families.

Women interviewees were also asked to reflect on specific attributes of the disputes that they encountered in the past. About 35% of both first wives and second wives responded that refusal of husbands to accept the spouse equal right to land is the main cause of disputes between husbands and wives. Lack of legal documents certifying the possession of women is the major reason according to 30.2% of first wives and 32.5% of second wives. The remaining reasons include unfair land distribution and refusal of community leaders to accept equal rights of women.

Table 42: Involvement in land related disputes

		Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
Did you involve in land related dispute in the past 2 years?	Wife1	11.2	9.6	7.9	5.9	8.2	3.9
	Wife2			3.0	5.8	4.9	0.4
The most common disputes to women in your kebele							
Conflicting land claim following divorce	Wife1	63.7	80.8	65.5	68.7	67.1	5.8
	Wife2	-	-	66.7	74.6	72.0	0.7

Conflicting land claim following inheritance	Wife1	35.2	30.8	20.5	36.3	29.9	18.2***
	Wife2	-	-	18.2	29.9	26.0	1.6
Boundary encroachment	Wife1	11.7	17.3	16.7	14.3	14.8	2.3
	Wife2	-	-	18.2	20.9	20.0	0.1
Share-cropping and rental matters	Wife1	3.9	38.5	4.2	12.2	9.2	70.2***
	Wife2	-	-	3.0	16.4	12.0	3.8*
Other	Wife1	0.6	3.8	0.4	0.8	0.8	6.6*
	Wife2	-	-	6.1	10.4	9.0	0.5
I do not know	Wife1	0.6	0.0	6.4	0.4	2.6	24.2***
	Wife2	-	-	6.1	0.0	2.0	4.1**

*, **, and *** show statistical significance at 10%, 5%, and 1% levels, respectively

Source: Field survey (2012)

Disputes related to women are mainly handled by elders. About 41% the responses of first wives and 45.5% of the responses of second wives show that disputes are managed by elders. Formal organizations (such as *kebele* and *woreda* administrations and women's affairs) are important according to 30.4% of first wives and 21.7% of second wives. Moreover, about 13% of first wives and 12.6% of second wives indicated that disputes are handled by relatives.

4.10.1.5. Women position on decision making

The most important benefit of land certification is that it increases the bargaining power of women at household level. While women take marginal positions in critical household decisions, the issuance of land certificates on the names of women is expected to increase their involvement in decision about their land. The survey results indicate that decisions are made jointly by husband and wives. This is the case for 78.9% of first wives and 77.5% of second wives. There are differences among the study regions in terms of decisions on what crops to grow on farmlands. The percentage of wives who could decide jointly with their husbands on the type of crops to be grown on their lands is the lowest in Oromia while it is the highest in Amhara. In

Oromia, substantial proportion of women (both first wives and second wives) responded that such a decision is made by their husbands.

The women respondents were also asked about their participation in the decisions regarding land rental markets. Small proportions of women (both first wives and second wives) can rent-out land in their names when they want (Table 43). Perhaps, such small figures have been obtained because of the fact that most of the land certificates have been awarded jointly to husbands and wives and hence wives should get the consent of their husbands to rent-out their land for which they may not succeed all the time. The majority of women (58.2% of first wives and 52.9% of second wives) who can rent-out their land when they want can make the decision by themselves.

Table 43: Participation of women on land-related decisions of their household

		Tigray	Amhara	Oromia	SNNPR	All	Chi-sq. value
If you have land in your name, who decides on what crops to grow on the land?							
I myself	Wife1	3.0	0.0	0.4	3.5	1.9	7.1*
	Wife2	-	-	0.0	6.0	4.2	1.3
My husband	Wife1	4.0	2.6	35.5	9.9	19.2	75.6***
	Wife2	-	-	38.1	10.0	18.3	7.8***
I and my husband	Wife1	93.0	97.4	64.1	86.6	78.9	59.8***
	Wife2	-	-	61.9	84.0	77.5	4.1**
If you possess land in your name, can you rent-out/sharecrop-out when you want? (% yes)	Wife1	39.4	22.0	21.2	28.7	26.9	12.7***
	Wife2	-	-	19.0	26.0	23.9	0.4
If you can rent-out/sharecrop-out when you want, do you make the decision by yourself? (% yes)	Wife1	59.0	11.1	88.5	37.9	58.2	37.8***
	Wife2	-	-	50.0	53.8	52.9	0.0

*, **, and *** show statistical significance at 10%, 5%, and 1% levels, respectively

Source: Field survey (2012)

Generally, participation of women on decision making on their land is high in the study regions. Perhaps, this is because of the land certification program taking place in these regions. Most husbands consult their wives before they rent out their land which was not the case in the past in many parts of the country. Information from focus group discussions also indicate that some female headed households are inclining towards share cropping than fully renting out the land after land certification because of the higher gain from share cropping.

4.10.2. The status of women as household heads

Landholding varies between male-headed households and female-headed households. In this regard, the average land holding of female-headed households is significantly smaller than male-headed households (Table 44). The two categories of households mainly acquired through kebele administration. However, the percent of female-headed households who acquire land through kebele is significantly higher than that of their counterparts which implies that female-headed households mainly depend on kebele to get land while male-headed households have notable also other options (such as inheritance, gifts, etc). Male-headed households cultivate more number of parcels than female-headed ones. However, the mean parcel size doesn't vary between the two categories of households implying that the existence of large number of parcels among male-headed households doesn't imply more fragmentation.

Table 44: Land acquisition and allocation, by gender of household head

	If hh acquired land through kebele (% yes)	No. of Parcels ⁴² (mean)	Mean plot size (ha)	Land holding (ha)				Private pasture land (% own)	Communal pasture (% own)
				annual crops	perennial crops	Other allocation	Total		
Male-headed	54.7	2.96	0.61	1.51	0.09	0.29	1.88	23.1	60.5
Female-headed	67.1	2.55	0.58	1.43	0.01	0.12	1.57	13.1	61.4
Total	56.8	2.88	0.60	1.5	0.07	0.26	1.82	21.3	60.7

⁴² includes grazing and forest lands but does not include plots rented-IN and Sharecropped-IN from others.

Chi-sq/t value	25.2***	3.18***	1.0	0.74	7.48***	4.42***	2.49**	8.87***	0.04
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, * show statistical significance at 5% and 1% levels

Source: Field survey (2012)

Female headed households were compared to male-headed households with respect to variables related to laws. Results show that the percentage of female heads who are aware of the existence of laws on land rights and obligations is significantly lower than that of male heads ($p < 1\%$) (Table 45). In terms of understanding the existing land laws, male-headed households are again better than female-headed ones. This indicates that male household heads have better access to information on land laws as compared to their female counterparts. The two groups were also compared to each other with respect to their assessments of the capability and fairness of the existing administrative/judiciary institutions as well as whether they believe that the government is reliable in protecting the rights of land users. In these regards, the differences between the two groups are not statistically significant.

Table 45: Awareness and understanding of land laws, by gender of household heads

	Male Headed	Female headed	All	Chi-sq. Value
Are you aware of the existence of laws on land rights and obligations? (% yes)	94.2	88.1	93.1	8.4***
Do you understand the laws on land rights and obligations? (% yes)	58.2	39.6	55.0	17.3***
Do you think that the existing administrative/ judiciary institutions /arrangements are CAPABLE of enforcing land rights and obligations? (% yes)	71.6	68.6	71.0	0.6
Do you think that the existing administrative / judiciary institutions /arrangements are FAIR ENOUGH in enforcing land rights and obligations? (% yes)	58.7	61.8	59.2	0.6
How confident are you that the government protects your right of land user? (% confident or very much confident)	90.7	94.3	91.4	2.3

*** indicate significance at 1% level

Source: Field survey (2012)

The majority of the sample households know their rights to land. Female-headed households are similar to their male counterparts with respect their perception on the bundles of land rights (Table 46). However, they are different with respect to their perception of rights to inherit land and to use land as collateral to get credit. In these regards, significantly lower percentages of female household heads perceive that they have the right to inherit land from other and bequeath it to others (e.g. heirs). Similarly, the percentage of female household heads who believe that land could be pledged as collateral against loans is significantly low as compared to male household heads.

Table 46: Perception of households on rights to their land, by gender of household head

	Male-headed	Female-headed	All	Chi Sq. value
Right to use	95.7	94.9	95.6	0.2
Right to bequeath	66.8	54.0	64.5	10.4***
Right to rent/share/contract out	64.9	61.9	64.4	0.6
Right to use it as collateral for credit	29.0	18.8	27.1	7.7***
Right to sell	5.0	7.4	5.5	1.5
Others	2.7	3.4	2.8	0.3
I don't know	0	0.6	0.4	4.4**

,* show significance at 5% and 1% levels

Source: Field survey (2012)

Larger percentage of female-headed households have received first-level certificates than male-headed households. However, male-headed households are better with regards to second-level certificates. Both are similar with regards to the percentage of households who didn't receive land certificates at all (Table 47).

Table 47: Status of land certification, by gender of household head

	No certificate	First-level certificate	Second-level certificate
Male headed	11.7	43.7	44.6
Female headed	8.0	55.1	36.9
All	11	45.8	43.2
Chi-square value	2.1	7.5***	3.4*

*,*** show significance at 10% and 1% levels

Source: Field survey (2012)

Both female-headed and male-headed households involve in land rental markets though the way they involve is different. About 46% of female-headed households rented-out their land in the season which is significantly higher than the figure corresponding to male-headed households (17.1%) (Table 48). On the contrary, only 7.4% of female-headed households rented/shared-in land during the past season. For male-headed households the figure is significantly higher (i.e. 30.2%). This implies that female-headed households participated in informal land markets mostly as land suppliers. Female-headed households rented/shared-out on average about 0.9ha of land. This is significantly larger than the figure corresponding to male-headed households (0.7ha). However, the two groups are not different in terms of total income from the rent and the length of contract period. Moreover, the two groups are not significantly different in terms of selection of tenants.

Table 48: Participation in informal land markets, by gender of household head

	Male-headed	Female-headed	All	Chi-sq./t- value
Did your household rented/shared out land during the past season? (% yes)	17.1	46.2	22.7	66.6***
Did your household rented/shared in land during the past season? (% yes)	30.2	7.4	26.0	38.9***
Aggregate participation (in/out/both) (%)	45.4	52.0	46.7	2.4
Average land rented/shared out (ha)	0.72	0.88	0.79	2.1**
Average land rented/shared in (ha)	0.91	1.16		0.48
Average contract/rental period (years)	2.3	2.8	2.5	1.0
To whom the household rented-out land in the past three years				
Relatives	42.2	42.4	42.3	0.0
Close friend	20.0	14.1	17.7	1.2
Neither relative nor close friend	36.3	42.4	38.6	0.8
Organization/company	1.5	0	0.9	1.3
Children	0.0	1.2	0.5	1.6

*** shows significance at 1% level.

Source: Field survey (2012)

The two groups were compared to each other with respect to their participation in on-farm natural resource management i.e. soil conservation, water management and planting of perennial crops. Our hypothesis was that being busy with household routines, women would be less likely

to participate in natural resource management. However, the result doesn't fully confirm our hypothesis i.e. female-headed households are different from their male counterparts only in some of the variables considered. With regards to soil conservation activities, the participation rate of female-headed households is significantly lower than male-headed ones only with respect to one variable i.e. percent of household who protect soil conservation structure constructed on their farms with the help of others (e.g. NGOs) (Table 49). The difference is marginal even with regards to this variable. Similarly, the difference between the two groups is not multidimensional with respect to on-farm water conservation. In this regard, female-headed households showed significantly lower performance than male-headed ones only with respect to on-farm water harvesting canals (Table 48).

Table 49: Investment in Soil Conservation Structure, by gender of household head

	Male-headed	Female-headed	All	Chi-sq./t-value
Is there any soil conservation structure constructed by household's own resources? (% yes)	36.8	32.4	35.9	1.2
Is there any soil conservation structure constructed by other but maintained or protected by the household? (% yes)	11.0	6.2	10.1	3.5*
Length of soil conservation structures constructed using own resources (meters)	50.5 (105.3)	46.1 (97.4)	49.7 (103.9)	0.5
Length of soil conservation structures constructed with the help of others (GOs, NGOs, CBOs) but maintained and protected by the household (meters)	13.9 (56.5)	7.8 (42.0)	12.7 (54.1)	1.6

Note: Numbers in parenthesis are standard deviations.

* shows significance at 10% level

Source: Field survey (2012)

Table 50: Investment on water conservation & harvesting practices, by gender of household head

	on-farm water retention structures		water harvesting canals		Hand-dug wells	
	by own resources	by organizations	by own resources	by organizations	by own resources	by organizations
Male-headed	8.8	3.2	12.5	2.3	4.9	1.0
Female-headed	6.2	1.2	1.1	1.7	3.4	0.0
All	8.3	3.0	10.4	2.2	4.6	0.8
Chi-sq. value	1.2	1.2	19.9***	0.3	0.7	1.8

*** shows significance at 1% levels

Source: Field survey (2012)

However, the two groups are significantly different in terms of most of the variables related to planting of perennial crops i.e. rates of participation, number of surviving seedlings, and sources of seedlings. The participation rate of female-headed households is significantly lower than male-headed ones (Table 51). Moreover, their performance is significantly lower than male-headed households in terms of number of surviving seedlings i.e. the number of surviving for male-headed household is about 50 while the figure corresponding to female-headed households is only 4. The two groups are also different in terms of their source of seedlings. Most of the male-headed households could raise their own seedlings while most of the female-headed households purchased them.

Table 51: Planting of perennial crops/trees, by gender of household head

	Plant perennial crops and trees (% yes)	Number of seedlings planted ⁴³	Number of surviving seedlings ⁴⁴	Source of seedlings (all type) (% ⁴⁵)		
				Raised	Purchased	Gift
Male-headed	41.5	318 (1363)	50.7 (334.0)	55.4	42.6	16.2
Female-headed	18.9	9 (39)	4.0 (22.3)	15.8	68.4	15.8
All	37.3	261 (1235)	42.1 (302.2)	51.5	45.0	16.2
Chi-sq./t value	31.3***	6.3***	3.9***	10.8***	4.6**	0.0

, ** show significance at 5% and 1% levels

Source: Field survey (2012)

Female-headed households were also compared to male-counterparts with respect to use of farm inputs. The differences are quite visible in this case. Female-headed households are on the lower side in terms percentage of people who use chemical fertilizers, organic fertilizers, and improved seeds as compared to male-headed households (Table 52). However, their average rate of application is similar to that of male-headed households (Table 53).

Table 52: Percentage of input users, by gender of household head

	Male-headed	Female-headed	All	Chi-sq. value
Do you use chemical fertilizers? (%yes)	78.2	57.4	74.4	32.7***
Do you use organic fertilizers? (%yes)	65.3	45.5	61.7	24.0***
Do you use improved seeds? (% yes)	50.3	25.0	45.8	34.7***

*** shows significance at 1% level

Source: Field survey (2012)

Table 53: Use of farm inputs, by gender of household head

	Male-headed	Female-headed	All	t-value
Chemical fertilizer use – (kg/ha)	96.2	83.3	93.9	1.1

⁴³ Includes only selected perennials such as coffee, hop, enset, sisal, khat, and bamboo.

⁴⁴ Include all perennials (fruits and non-fruit type)

⁴⁵ Households who didn't plant perennial crops have been excluded from computation of percentage values.

	(138)	(131)	(136.8)	
Organic fertilizer use – (kg/ha)	729.5	453.2	677.9	1.3
	(1880.7)	(2446)	(1915.5)	

Source: Field survey (2012)

The two groups of were compared in terms of access to credit and the intensity of credit use. The percentage of households who had access to agricultural credit during the past season is generally low both for female-headed households (14.8%) and male-headed (15.7%). The chi-square test shows that the two groups are similar in terms of access to credit (Table 54). Similarly, no significant differences were observed between them with regards to the amount of credit used and sources of credit.

Table 54: Use of credit, by gender of household head

		Male-headed	Female-headed	All	t/chi-sq. value
Credit taken for farming (Br)		322.2 (933.4)	245.2 (680.1)	308.8 (894.8)	1.2
Credit for farming during last season (% borrowed)		15.7	14.8	15.5	0.1
Source of credit (% of all sources)	Government	29.9	38.5	31.5	0.7
	NGOs	6.0	3.8	5.6	0.2
	Credit & saving associations	49.6	42.3	48.3	0.5
	Private lenders (e.g. relatives/friends)	10.3	3.8	9.1	1.1
	Cooperatives	4.3	11.5	5.6	2.1

Source: Field survey (2012)

The average land productivity for male-headed households is about 20,000 birr/ha and that of female-headed households is about 15,000 birr/ha. Although the difference between the two figures is apparently big, it is not statistically significant. However, male-headed households are significantly better than female-headed households in terms of labor productivity ($p < 0.1$) (Table 55).

Table 55: Land and labor productivities

	Male-headed	Female-headed	T-value
Land productivity (Br./ha)	19930	15136	1.19
Labor productivity (Br./ME)	7829	6931	1.81*

* indicates level of statistical significance at 10%.

Source: Field survey (2012)

5. CONCLUSIONS

This study tried to capture the major dimensions of the possible impacts of land certification. The results are summarized in Table 26. The descriptive results provide baseline information against which future results on similar parameters will be compared. Moreover, the results can show preliminary impacts of land certification as both second-level and first-level certification have already been implemented in all but one of the study regions.

Overall the great majority of farmers feel secured on the existing land tenure system. Nearly all of the sample respondents believe that the land registration program would assure one's security overland. In fact, more than 95% expect that their current land would remain within their control in the coming 15 years. However, there were also respondents who expect land redistribution in the near future i.e. within the coming 5 years. Regional differences are visible and Tigray takes the largest percentage figure (i.e. 20.3%) and SNNPR the smallest (i.e. 6%).

Various type of natural resource management practices are undertaken in the study area both with farmers' own resources and with the contributions of the government and NGOs. We collected data on soil conservation practices, on-farm water management practices, and tree planting practices of the sample households. Results show that the involvement of households in natural resource management is generally low. Only 8.3% of the sample households participated in on-farm water management practices. For soil conservation, the figure is relatively high but it indicates that the majority do not invest in soil conservation. The number of seedlings planted by the sample households during the past 24 months was substantial (i.e. 261 seedlings) but only a few seedlings could survive (42 seedlings). Regional differences are significant in terms of participation in the three forms of natural resource management. Participation in soil conservation is better in Tigray while it is the least in SNNPR. In terms of the rate of participation on the construction of on-farm water retention structures, Amhara is the best with 18.9% households participating in that activity while Oromia takes the least position with 3.2%. In terms of the rate of participation in tree planting, SNNPR is the best with 70.1% and Oromia is the least with 16.1%. However, the number of tree survived Amhara takes the lead with about 173 surviving seedlings and Tigray takes the least position with about 6 surviving seedlings.

While the majority of peasant households acquire land through formal land allocations, a substantial proportion of them depend on informal land markets. Nearly one-half of the sample households participate in informal land transactions i.e. 23% participated as land suppliers whereas 26% participated as land seekers. The rate of participation is the highest in Amhara region and the lowest in SNNPR. Both female-headed and male-headed households involve in land rental markets though the way they involve is different. Female-headed households are mostly active on the supply side of the land market while the participation of male-headed households is substantial in both supply and demand sides of the market.

We also considered application of farm inputs in the baseline study. The mean rate of application for chemical fertilizers (DAP and Urea) is 93.8 kg per hectare which significantly varies across the study regions but not among certificate holders and gender categories. The average rate of application for organic fertilizers is about 678 kg per hectare; again this varies among the study regions. Organic fertilizer application also significantly varies among the status of land certification. Improved seeds are used by about 46% of the sample households. The difference between male-headed households and female-headed households is quite high with the latter taking the lower side. However, the difference among the study regions is marginal whereas it is insignificant across the status of land certification.

Land is the major asset of peasant households while it is also the main source of both conflictive and cooperative interactions among them. About 17% of the sample households were involved in at least one land related dispute in the two years before the survey time. Participation is relatively low in SNNPR and non-holders of land certificate while it is relatively high in Amhara region and first-level certificate holders.

The results show that the majority of households have good perception on the willingness, capability and fairness of local administration in protecting land rights. Regional differences are significant in terms of all of the three parameters of governance. Oromia is the best in terms of the percent of respondents who are confident that the government protects the land rights of peasant households whereas Tigray is the best in terms of the percent of respondents who perceive that local administrations are capable as well as fair enough in enforcing rights.

Most wives can decide jointly with their husbands. This equally holds true for first wives and second wives in polygamous families. There is a significant regional difference, however. Amhara region is the best in terms of the percent of first wives who decide jointly with husbands on land matters whereas SNNPR is the best (i.e. better than Oromia) with regards to the involvement of second wives on land related decisions. Differences across the status of land

Table 56: Summary of indicators to measure the impact of land certification

	Selected Variable	Average value (mean/percent)	Region		Certificate holding		Gender	
			Significant variation?	Best region	Significant variation?	Best category	Significant variation?	Best category
1. Perception on land security	I believe that land registration program will assure one's security over land (% yes)	99.1	no	-	no	-	no	-
	I believe that land redistribution is likely to take place in the coming 5 years (% yes)	11.3	yes	SNNPR	yes	Second-level certificate holders	no	-
	I believe that my current land will remain within my control in the coming 15 years (% yes)	95.2	Yes	SNNPR	no	-	no	-
2. Natural Resource Management	Length of soil and stone bunds, and strips of hedges constructed by survey participant, measured in linear meters	49.7	yes	Tigray	no	-	no	-
	Investment in water retention structures such as ponds and ditches constructed by survey participants (% of households)	8.3	yes	Amhara	yes	First level certificate holders	no	-
	Number of seedlings planted	261	yes	SNNPR	yes	No certificate holders	yes	Male-headed households

	Number of seedlings survived (i.e. 3 months plus)	42	yes	Amhara	no	-	yes	Male-headed households
3. Engagement in land transactions	Involvement in informal land markets (% of households)	46.7	yes	Amhara	yes	First-level certificate holders	no	-
	Involvement in renting/sharing out land (% of households)	22.7	no	-	no	-	yes	Female-headed households
	Involvement in renting/sharing in land (% of households)	26.0	yes	Amhara	no	-	yes	Male-headed households
4. Use of farm inputs and productivity	Amount of chemical fertilizer applied per hectare of cultivated land per crop season (kg/ha)	93.8	yes	Amhara	no	-	No	-
	Amount of organic fertilizer applied per hectare of cultivated land per crop season (kg/ha)	677.8	yes	Oromia	yes	Second-level certificate holders	No	-
	Do you use improved seeds? (% yes)	45.8	yes	Amhara	no	-	yes	Male-headed households
	Land productivity (birr/ha)	19,077	no	-	no	-	no	-
	Labor productivity (birr/man equivalent)	10,293	yes	Oromia	yes	First level certificate holders	yes	Male-headed households
5. Land related disputes experienced	Rate of participation in land related disputes in the past 24 months (% of households involved)	17.3	yes	SNNPR	yes	No certificate holders	no	-

	Number of land related disputes reported	1.28	no	-	no	-	yes	Male-headed households
6. Governance	How confident are you that the government protects your right of land user? (% confident or very much confident)	91.4	yes	Oromia	yes	Second-level certificate holders	no	-
	Do you think that the existing administrative/ judiciary institutions /arrangements are CAPABLE of enforcing land rights and obligations? (% yes)	71.0	yes	Tigray	-	-	no	-
	Do you think that the existing administrative / judiciary institutions /arrangements are FAIR ENOUGH in enforcing land rights and obligations? (% yes)	59.2	yes	Tigray	yes	First-level certificate holders	no	-
7. Farm Size & fragmentation	Total land holding (ha)	1.83	yes	Oromia	-	-	yes	Male-headed households
	Number of parcels cultivated	2.88	yes	Oromia	-	-	yes	Male-headed households
8. Women empowerment	Percent of first wives who decide jointly with husband on what crops to grow on the land (%)	78.9	yes	Amhara	no	-	-	-
	Percent of first wives who decide jointly with husband on what crops to grow on the land (%)	77.8	yes	SNNPR	no	-	-	-

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Annex

List of regions, *woredas*, and *kebeles* covered by the study

Region	Woreda	Kebele
Tigray	Raya Azebo	Kara Aysheba*
		Tsigai
		Genetie
		Wargiba
	Tahitay Adiabo	Ziban Gidena*
		Mentebteb
		Atsirega
Amhara	Wenberima	Yergen
		Markuma*
Oromia	Dugda	Chepo Chorkie
		Abuno Gebrel
		Giraba Korkie Adi*
		Jewie Bofo
	Jezu	Gorie Tebino
		Sinbietie Fincha
		Lokie Bokicha
		Waguda Guro*
SNNPR	Halaba	Yeyo*
		Debeso
		Yambo
		Asorie
	Wendogenet	Abaye
		Yewu
		Ado

*Non-ELAP kebeles

ANNEX VII—DESIGN REPORT

Annex 7 is the “USAID/Ethiopia Strengthening Land Tenure and Administration Program (ELTAP) and Ethiopia Land Administration Program (ELAP): Impact Evaluation Design (DRAFT)” as developed in October 2014 for the endline data collection efforts.



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FROM THE AMERICAN PEOPLE

USAID/Ethiopia Land Tenure Administration Program (ELTAP) and Ethiopia Land Administration Program (ELAP)

NOVEMBER 2014

This document was produced for review by the United States Agency for International Development. It was prepared by Cloudburst Consulting Group, Inc. for the Evaluation, Research and Communication (ERC) Task Order under the Strengthening Tenure and Resource Rights (STARR) IQC.

DRAFT

Prepared for the United States Agency for International Development, USAID Contract Number AID-OAA-TO-13-00019, Evaluation, Research and Communication (ERC) Task Order under Strengthening Tenure and Resource Rights (STARR) IQC No. AID-OAA-I-12-00030.

Implemented by:

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USAID/Ethiopia Land Tenure Administration Program (ELTAP) and Ethiopia Land Administration Program (ELAP)

Impact Evaluation Design (DRAFT)

OCTOBER 2014

DISCLAIMER

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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ACRONYMS AND ABBREVIATIONS

DfID	Department for International Development
EEA	Ethiopian Economic Association
ELAP	Ethiopia Land Administration Program
ELTAP	Ethiopia Land Tenure Administration Program
ERC	Evaluation, Research and Communication
GIS	Geographic Information System
GoE	Government of Ethiopia
GPS	Global Positioning System
HH	Household
IE	Impact Evaluation
IRB	International Review Board
LIFT	Land Investment for Transformation
LTD	Land Tenure Division
NGO	Non-governmental Organization
REILA	Responsible and Innovative Land Administration
RFP	Request for Proposal
SIDA	Swedish International Development Cooperation Agency
SNNP	Southern Nations Nationalities and Peoples
SWC	Soil and water conservation
USAID	United States Agency for International Development

I.0 INTRODUCTION

This document describes an impact evaluation (IE) for the USAID-supported Ethiopia Land Tenure Administration Program (ELTAP: 2005-2008) and the Ethiopia Land Administration Program (ELAP: 2008-2013). The evaluation will focus on second level land certification activities under ELTAP and ELAP and the impact these have had on rural households. This work is being conducted under the Evaluation, Research, and Communications (ERC) Task Order # AID-OAA-TO-13-00019 for USAID.

Following decades of insecurity marked by conflict, famine, regime change, and land redistribution, starting in the late 1990's the Government of Ethiopia (GoE) embarked on an ambitious program to document and register lands held by rural households in an effort to increase their tenure security and certify their long-term use rights. Ethiopia's "first level" land certification program has been hailed as one of the most successful low-cost land registration programs in Africa and elsewhere, and research to date suggests that first level certification has had a positive impact on a variety of economic outcomes (Deininger, Ali, & Alemu, 2011; Hagos & Holden, 2013; Holden, Deininger, & Ghebru, 2009, 2011; Holden & Ghebru, 2013).

Despite being an extremely important step in strengthening the tenure security of rural farmers, first level certification had a number of shortcomings that prevented this from being a viable long-term solution (Bezu & Holden, 2014). To help address these issues, USAID began working with the GoE to support "second level" land certification starting with ELTAP (2005-2008) and continuing under ELAP (2008-2013). In supporting second level land certification activities, ELTAP and ELAP piloted the use of handheld GPS devices to map and demarcate parcel boundaries, a key component of land administration systems that was not part of the first level activities.

The GoE is planning to significantly scale-up second level certification using its own resources and support from its development partners, including through the UK's Department of International Development (DFID) Land Investment for Transformation (LIFT) Programme, the Responsible and Innovative Land Administration (REILA) project supported by Finland, and the Sustainable Land Management Program II supported by the World Bank. These efforts will be considerably larger in scale than USAID's ELTAP and ELAP programs, despite these having been the largest programs to date. Although the GoE will be using a system for delineating boundaries based on imagery, rather than handheld GPS, as was used for ELTAP and ELAP, there is a lack of information on the impact second level certification has over first level certification.

To help fill this gap in information and understanding and better inform future policy, this evaluation will focus on measuring the impact of second level land certification in comparison to first level land certification, which has already reached the majority of rural smallholders in the Highland regions (Amhara, Oromia, Southern Nations Nationalities and Peoples, and Tigray). In the context of the larger policy dialogue and in answering the question "how secure is secure enough?" the overarching question that underlies and motivates this evaluation is:

"Does second level land certification marginally increase tenure security and improve rural livelihoods as compared to first level land certification?"

Following from the broad objective of measuring increased tenure security, a number of ancillary questions help frame the broader policy discussion and inform a range of land tenure issues. In particular, USAID and the GoE have expressed interest in the following evaluation questions:

- Q-I. Does the added expense of second level land certification as compared to first level certification provide additional land tenure security benefits at least equal to the difference in cost between the two certification methodologies? Another way to state this is: Are the marginal benefits of second level certification greater than the marginal costs as compared to first level certification?
- Q-II. How, if at all, have first level vs. second level land certificates been used as proof of ownership (e.g. for obtaining micro-loans, resolving land disputes, or resolving challenges to their land claim)? If they have not been used, why not?
- Q-III. Are there differences between land that has first vs. second level certification in the number and types of transactions that are recorded in the registries at the *woreda*/regional level? If so, which transactions and why are these transactions not being formally recorded?
- Q-IV. How do beneficiaries, including landholders and local government officials, perceive the value of first and second-level certifications?
- Q-V. What factors explain the large gap between the number of households surveyed/registered and those that actually received their land certificates?
- Q-VI. Has second level land certification affected intra-household welfare relative to first level land certification?

These questions can be classified as being: a) process oriented - relating to the performance and efficiency with which the programs were delivered (i.e. Q-III and Q-V); b) impact oriented – referring to changes in livelihood and economic well-being of beneficiaries targeted by the intervention (i.e. Q-II and Q-VI); or c) combined process and impact – combining aspects that are oriented with program processes like the cost of service delivery with development outcomes like change in household income which is impact oriented (i.e. Q-I and Q-IV). This evaluation is mainly concerned with assessing the impact of second level certification and thus focuses on Q-I, Q-II, Q-IV, and Q-VI, which are used in specifying a series of testable development hypotheses.¹

What follows in this report includes an exploration of the theoretical underpinnings of ELTAP/ELAP, a review of the literature surrounding second level land certification and tenure security, a detailed list of key research hypotheses to be tested, a presentation of the survey instruments and data management design, and the proposed timeline and schedule of deliverables. The evaluation will provide an evidence base for improved policy making and programming by testing the development hypothesis that second level land certification increases tenure security and improves rural livelihoods compared to first level.

¹ Although this evaluation will not address those process oriented questions and components directly, to allow for that possibility at a later date, additional information on plot-level land transactions (i.e. permanent transfer of ownership and temporary leasing/rental activity), whether or not these are registered with the *woreda* land administration office, and the associated costs (implicit and explicit) are included as part of the endline household questionnaire. This additional information will be included in the final evaluation report as descriptive statistics and may facilitate undertaking a performance evaluation. If additional funding becomes available, a performance evaluation methodology could be used to address Q-III and Q-V.

2.0 BACKGROUND

CONTEXT FOR LAND TENURE INSECURITY

Consecutive national governments in Ethiopia have implemented differing approaches to land administration. The imperial regime of Haile Selassie (pre-1975) allocated land ownership to political supporters without regard to its occupation or use by farming populations. This created a feudal regime of landholdings in much of the country, with many farmers operating tenancies on lands held by absentee landlords (USAID, 2011). Upon the overthrow of the monarch in 1975 by the Derg regime, the Proclamation of March 1975 declared land to be the collective property of the people. Between 1976 and 1991, the Derg regime implemented a series of reforms in which the system of tenancy and elite rule was abolished, and all previously privatized land was redistributed to farmers (Adgo, Selassie, Tsegaye, Abate, & Ayele, 2014). The Derg regime also repeatedly redistributed land every year or two with the aim of achieving an equitable allocation of usufructuary rights. Yet, as a result, these frequent redistributions reduced land access and undermined secure ownership of land and natural resources (USAID, 2011).

After the fall of the Derg regime in 1991, the transitional government of Ethiopia announced the continuation of the land policy of the Derg regime. In 1995, state ownership of land was instituted in Ethiopia's new constitution, which prohibits private ownership of land and affirms that the right to ownership of rural and urban land, as well as all natural resources, is exclusively vested in the State and in the peoples of Ethiopia (USAID, 2011). In 1997, the last official redistribution in Amhara Regional State was declared and undertaken (Desta, Kassie, Benin, & Pender, 2000), and in the same year a land law was introduced giving legislative power to the Federal Government but delegating implementation to the Regional States (Adgo et al., 2014). In 2002, the government delegated greater legislative powers to the Regional States in matters related to land administration, including authorities that provided the legal basis for land certification activities (Adgo et al., 2014). Current land policy allows rural households to legally lease their land and engage in sharecropping and lending of land for limited periods; although, buying, selling, and mortgaging land are still prohibited (Adgo et al., 2014).

FIRST AND SECOND LEVEL LAND CERTIFICATION

Beginning with Tigray in 1998, the Government of Ethiopia embarked on a rural land registration program to increase the tenure security and certify the long-term use rights of rural households. Followed by Amhara in 2002 and Oromia and the Southern Nations Nationalities and Peoples (SNNP) regions in 2004, Ethiopia's first level land certification program has been hailed as one of the more successful and cost effective land registration programs in Africa and elsewhere. The estimated cost of Ethiopia's first level certification is reported to be approximately US\$1 per parcel (Alemu, 2006;

Deininger, Ali, Holden, & Zevenbergen, 2008; Land Equity International, 2006)². In addition to being considered one of the least costly land registration programs in Africa and elsewhere (Deininger et al., 2008), Ethiopia's first level land certification program was impressive in how quickly it was scaled up and the large number of households that were covered in a relatively short period of time. By the mid-2000s, approximately 20 million plots were registered from 6 million households (Deininger et al., 2008), with upwards of 12 million households covered by the end of the decade (Hailu & Harris, 2013). To date, the Ministry of Agriculture's Land Use Directorate estimates that 90% of farming households have first level land certification (MoA, 2013). Often associated with the 'green books'³ issued to households as a record of their land holdings and rights, research to date suggests that first level certification has had a positive impact on a variety of economic outcomes. Among the key findings are increased investment and land productivity (Holden et al., 2009), increased land rental market activity (Deininger et al., 2011; Holden et al., 2011), as well as increased women's participation in land market activity and even improved child nutrition (Holden & Ghebru, 2013).

Despite being an extremely important step in strengthening the tenure security of households who had been subjected to the uncertainty of land redistribution in the previous decades, first level certification is not generally viewed as being viable for the long-term as a result of some key shortcomings (Bezu & Holden, 2014). Chief among these limitations is that the first level certification process did not map individual plots or provide the level of spatial detail documenting boundaries that would allow for the development of cadastral maps for improved land use management and administration. The lack of computerized land registries further complicates the management and updating of registration records. To incorporate the necessary geographic information system (GIS) detail, generate parcel maps, computerize land records, and strengthen rural land administration system in general, the Government of Ethiopia (GoE) has been working with USAID and other development partners, including the Swedish International Development Cooperation Agency (SIDA), the World Bank, the United Kingdom's Department for International Development, and the Government of Finland under the Responsible and Innovative Land Administration Project (REILA) to explore alternative approaches to "second level land certification." The GOE plans to provide second level certification to an estimated 50 million land parcels (Hailu & Harris, 2013), and there is considerable interest by GoE and donors for research and analysis to assess and understand the impact second level certification will have on rural households and the functionality of the land administration system in general.

USAID SUPPORT TO SECOND LEVEL LAND CERTIFICATION

Starting in 2005 with the Ethiopia Land Tenure Administration Program (ELTAP), USAID has supported *woreda*-level (district) land administration agencies in Tigray, Amhara, Oromia and SNNP to pilot a second level land certification process that relies on the use of handheld GPS units to demarcate plot boundaries. Following the end of ELTAP in 2008, USAID support for second level certification continued under the Ethiopia Land Administration Program (ELAP), which ran from August 2008 to February 2013.

² By comparison, low-cost estimates for land titling in West Africa are in the range of US\$7-10 per parcel (Lavinge-Delville, 2006). Depending on the scale at which titling is taking place, in Madagascar the costs of issuing titles on an on-demand-basis range from US\$150 to US\$350 per parcel (Jacoby & Minten, 2007; Teyssier, Raharison, & Ravelomanantsoa, 2006), with low-cost estimates under a systematic approach in the range of US\$7-28 per parcel (World Bank, 2006). In Uganda, the cost of issuing customary land certificates is US\$40 per parcel (Deininger et al., 2008). Outside of Africa, the cost of first time registration ranges widely from of \$US10-13 per parcel (in Moldova and Peru respectively) to over US\$1,000 on the high-end (\$1,064 for Trinidad and Tobago and \$1,354 in Latvia) (Burns, 2007).

³ Green booklets were issued in Oromia and SNNP while in Tigray these were blue (Deininger et al., 2008)

The main objective of ELTAP was to assist the GoE to implement a sound land certification system that provides holders of rural land use rights with robust and enforceable tenure security in land and related natural resources in the four regional states of Amhara, Oromia, SNNP, and Tigray (USAID, 2008). Four components supported this objective:

- Component 1: Land Certification and Administration;
- Component 2: Public Information and Awareness;
- Component 3: Security of Land Tenure and Dispute Resolution; and
- Component 4: Policy Development and Program Integration.

The main objective of ELAP was to assist the GoE to strengthen and enhance rural land tenure security and land administration, also through four components (USAID, 2013):

- Component 1: Strengthening the legal framework on land administration;
- Component 2: Promoting tenure security to enhance land investment in high potential areas;
- Component 3: Increasing public information and awareness; and
- Component 4: Strengthening the capacity of land administration institutions.

Under ELTAP, second land certification was covered under Component 1, whereas under ELAP, it was covered under Component 2. Despite the different labels, the two components were substantively similar. ELAP used the same methods as ELTAP for mapping parcels, which involved recording parcel boundaries based on readings taken with handheld GPS devices. One important distinction between the two deals with the areas targeted for second level activities. Under ELAP, certification efforts were focused only on those areas with high agricultural production and investment potential. The extent to which ELTAP and ELAP may have had differential impacts on key outcome indicators can be addressed in the analysis strategy and incorporated into the empirical model appropriately (i.e. through the use of indicator or interaction variables).

Under ELTAP, second level cadastral surveying and registration of rural land started in Amhara and Oromia regions during the first quarter of 2007, followed by Tigray and SNNP regions in the second quarter. Through the end of May 2008, a total of 147,449 households were visited from six *woredas* in each region - 24 in total. Over the course of ELTAP, the boundaries of 704,754 parcels were mapped using GPS devices and registered with the land administration office. By the end of the program, approximately 56% of these parcels had been formally issued a certificate.

Land certification under ELAP was to continue in each of the four regions using the methodologies developed under ELTAP but targeting areas with high potential for agricultural production and investment. The criteria to identify high value areas to focus further second level certification activities were (USAID, 2013):

- High agricultural potential in terms of high rainfall, irrigation, and cash crops grown;
- High land transaction in terms of renting and sharecropping;
- Good infrastructure and access to markets; and,
- Presence of agricultural investors, with all *woredas* meeting this criterion.

TABLE 1: CERTIFICATION UNDER ELTAP AND ELAP

Year	Program	Number of Households	Parcels	
			Registered and Surveyed	Certificates Issued
2005	ELTAP	-	-	-
2006	ELTAP	-	-	-
2007	ELTAP	102,497	494,989	-
2008	ELTAP	44,952	209,765	396,017
Sub-total		147,449	704,754	396,017
2009	ELAP	10,613	12,101	-
2010	ELAP	33,523	52,047	-
2011	ELAP	38,685	79,068	88,766
2012	ELAP	-	-	103,418
Sub-total		82,821	143,216	192,184
Grand Total		230,270	847,970	588,201

NOTE: The total number of certified parcels under ELAP, 192,184, is higher than the number of parcels registered, 143,216, because it includes parcels registered and surveyed under ELTAP but certified under ELAP.

Source: (USAID, 2008, p. 13 Table 3.4, 2013, p. 24 Performance Indicators)

Officials in Amhara Region decided not to participate in the certification components of ELAP (USAID, 2013 p. 18). In the end, a subset of *kebeles* (villages) from *woredas* in three of the regions participated in the certification activities under ELAP: four in Oromia and two in each of SNNP and Tigray. Over the course of ELAP, 143,216 parcels were registered and surveyed while 192,184 parcels were certified. The number of parcels certified under ELAP exceeds the number surveyed and registered since the number certified includes parcels surveyed under ELTAP but which received certificates under ELAP.

3.0 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Using the above research questions as a starting point, the literature review is organized into four themes: i) agricultural investment and productivity; ii) land transactions and access to financing; iii) disputes and conflict; and iv) land management and soil conservation. This review focuses primarily on the state of research as it applies to Ethiopia. A recent review covering similar topics with a more extensive review of the literature can be found in the ELAP baseline data report (Ethiopian Economics Association, 2013).

INVESTMENT AND AGRICULTURAL OUTCOMES

A basic premise of stronger and more secure land tenure is that the enforcement of these rights lessens the risk of landholders being forcibly displaced and allows for a level of long-term security and a sense of permanence that encourages land-related investment (Besley, 1995). Although secure tenure alone is not sufficient to induce investment, it is a necessary condition for individuals to undertake long-term investments by giving them a sense of permanence and security. Numerous studies have demonstrated the positive impact greater land tenure security has on agricultural outcomes and investment in rural land (Deininger et al., 2011; Deininger & Chamorro, 2004; Feder, Chalamwong, Onchan, & Hongladarom., 1988; Holden et al., 2009; Jacoby, Li, & Rozelle, 2002; Rozelle & Swinnen, 2004). In Ethiopia, research to date suggests that first level land certification increased investment at the individual, as well as the community level (Deininger et al., 2008; Holden et al., 2009) and that farms with certified land tend to be more productive than those that are not (Ghebru & Holden, 2008). The higher productivity is attributed to the use of better inputs, such as superior cultivars, pesticides, and synthetic fertilizers.

LAND TRANSACTIONS AND ACCESS TO FINANCING

The land policy at the time of first level land certification allowed rural households to legally rent out their land (Adgo et al., 2014). Empirical research has shown that activity in land rental markets increased as a result of the introduction of first level certification (Deininger et al., 2011; Holden et al., 2011). Since land leasing was already permitted under the first level program, it is unclear whether second level land certification will lead to increased rental activity. Despite being legally permissible prior to second level certification, the additional information on specific parcel details, notably the size of the parcel and a map of the boundaries, could potentially reduce information asymmetries between renter and lessee by verifying key information, thereby allowing the parties to enter into a contract (formal or informal) that might not otherwise have taken place. Second level certification is also expected to increase the tendency for widows and women-headed households to engage in renting and sharecropping activity. Prior to receiving certification, women often limited such activity to relatives out of concern that the

renter/sharecropper might claim the land use right as his own after establishing use for several years. Certification provides women with additional reassurance and documentation of their rights and, as a result, is expected to increase women's tendency to engage in these types of short-term, temporary transfer of rights to non-relatives.

Although some land transactions, such as renting/leasing and sharecropping, are allowed, this does not apply to buying, selling, or mortgaging of land, which are still illegal. Although land cannot be used as collateral to secure a loan, research does support that informal financial institutions can be an effective alternative in supporting smallholder credit access to promote investment in new technologies. Informal means, such as financing provided collectively by a local group and using norms of social accountability as an enforcement mechanism, is one such model (Knox, Meinzen-Dick, & Hazell, 2002). Indeed, in Ethiopia, there is evidence that issuance of second level certificates makes it easier for small landholders to obtain micro-financing. One common mechanism for securing such loans is group lending, which is based on the principle that all members of the group are liable to repay the loan in the event one of the members defaults, thus providing security to the lender. Groups have adopted a practice where each member deposits their second level certificate with the group in order to join. Instances of this type of activity include Halaba woreda, SNNP Regional State and the Rift Valley of Oromia Regional State (USAID, 2013). Rather than being used as collateral in the formal sense – such that a bank could repossess land used as collateral on an unpaid loan – credit is being accessed through informal mechanisms, where the land certificate is *de facto* collateral – showing the capacity and ability for repayment – and the lender relies on group pressure or other extra-legal means for enforcement. Second level certificates may also facilitate access to credit by reducing the transaction costs associated with obtaining credit. By using the certificate as a means to verify information, such as plot size, on a loan application, microfinance agencies are able to reduce the time and effort required to process applications (Mola, 2011).

DISPUTES AND CONFLICT

In countries like Ethiopia, where livelihoods for most rural residents derive from land, land-related conflicts over ownership and boundary disputes can be particularly harmful and undermine productive activities. A number of studies indicate that land registration programs have the ability to reduce boundary disputes and litigation arising from such conflicts. In Ethiopia, there is evidence that land registration and certification has reduced the number of conflicts arising from border and inheritance disputes (Giri, 2010; Holden & Tefera, 2008). A basic premise of stronger and more secure land tenure is that the enforcement of these rights lessens the risk of being forcibly displaced and allows for a level of long-term security and a sense of permanence that encourages land-related investment (Besley, 1995). Tenure security also reduces the need expend resources to defend claims, which can be particularly important for women and minority groups, whose rights may not be sufficiently protected under traditional practices (Joireman, 2008).

LAND MANAGEMENT AND SOIL CONSERVATION

Several studies show that land certification programs in Ethiopia have induced better land management practices (e.g. tree planting, construction of stone terraces) and ultimately improve land productivity (Deininger et al., 2011; Holden et al., 2009). However, whether land certification on its own is enough to induce soil conservation practices directly or whether this is a secondary consideration resulting from some other primary (i.e. economic) objective is not clear. The finding by Kahsay (2011) that land

certification's impact on soil conservation depends on household characteristics, such as off-farm economic opportunities and household labor, further highlights the difficulties of isolating this impact.

DRAFT

4.0 RESEARCH HYPOTHESES AND INDICATORS

In the context of the larger policy dialogue and in answering the question “how secure is secure enough?” a number of hypotheses have been proposed to test the relationship between second level certification and development outcomes. Note that the vast majority of smallholder plots in the highland regions covered under ELTAP and ELAP had already received first level certification at the time the baseline data was collected. As a result, any impact of second level certification will be in relation to what exists under first level certification – that is, the marginal benefit of second over first level certification.

The specific hypotheses to be tested include:

- H-1: Having a second level land certificate increases household access to credit (i.e. micro-finance).
- H-2: Second level land certification reduces the number of land-related disputes households face, and households with second-level land certificates require less time to resolve land-related disputes when they arise.
- H-3: Having a second level land certificate increases the likelihood households engage in land rental and sharecropping activities.
- H-4: Second level land certification increases household investment in productive assets – short and long-term.
- H-5: Second level land certification results in households having higher levels of agricultural productivity.
- H-6: Second level land certification encourages households to invest more in soil and water conservation (SWC).
- H-7: Having a second level land certificate results in stronger perceived tenure security for women and men.
- H-8: Second level land certification increases the extent to which households engage in off-farm income generating activities.
- H-9: Second level land certification increases women’s involvement in land management and decision making activities.

Addressing and empirically testing these hypotheses requires specifying indicators to measure and track changes in key outcomes to capture program impact. Following from the hypotheses above, outcome

indicators include: value of agricultural output per unit of land; cropping decisions (i.e. higher value perennials vs. lower value annual crops); use of fertilizer and other inputs; household and hired labor; soil conservation measures; frequency of land disputes of different types and the associated costs; and perceived risk of conflict and expropriation. To the extent possible, the analysis will differentiate the impact of certification by gender, as well as consider intra-household effects concerning asset control and participation in production-related activities. Depending on the hypothesis being tested and the specific indicator under consideration, location characteristics, such as distance to urban market or to *woreda* capital, may be of particular relevance and will be factored into the analysis as appropriate (i.e. as a control variable in regression analysis).

H-1: HAVING A SECOND LEVEL LAND CERTIFICATE INCREASES HOUSEHOLD ACCESS TO CREDIT (I.E. MICRO-FINANCE)

Indicators:

- A.** Share of households having used land certificate to secure credit
- B.** Share of households perceiving land certification program will improve access to credit

Disaggregation:

- 1) By gender: Compare access to credit for those households whose head is male vs. households headed by a female.
- 2) By source of credit: Micro-finance, bank, individual

Notes:

- 1) In Ethiopia, land certificates (first or second level) cannot legally be used as collateral. Therefore, second level certification might increase credit if it is used to secure a loan through informal means.
- 2) The ELTAP baseline HH survey did not include content designed to capture the use of land as collateral.
- 3) Although the ELAP HH baseline did include content on the use of land and certificates to obtain credit, the information collected was limited. The endline survey for households includes greater depth and detail on the extent that land and land certificates are used to obtain credit. This information be used to create variables to directly compare with those credit-related questions from the ELAP baseline.
- 4) Assessing impact of ELTAP on access to credit will rely primarily on analysis of endline data using cross-section analysis methods.

H-2: SECOND LEVEL LAND CERTIFICATION REDUCES THE NUMBER OF LAND-RELATED DISPUTES HOUSEHOLDS FACE, AND HOUSEHOLDS WITH SECOND-LEVEL LAND CERTIFICATES REQUIRE LESS TIME TO RESOLVE LAND-RELATED DISPUTES WHEN THEY ARISE

Indicators:

- A.** Share of households involved in a land-related dispute
- B.** Average number of land-related disputes per household
- C.** Average time taken to resolve land dispute

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By type of dispute: boundary/encroachment, inheritance, and divorce
- 3) By party: with family members, with non-family members

Notes:

- 1) Does not cover disputes relating to household grazing animals on someone else's crop or pasture land) as this was explicitly excluded from the baseline survey questionnaires).

- 2) The revised endline household and wives questionnaires allows for detail on disputes by parcel and are designed so that endline indicators can be directly compared with baseline data to assess impact (i.e. specifies disputes in the last 2 years).
- 3) The reference period is the number of disputes in the previous two years for both the baseline and endline surveys.

H-3: HAVING A SECOND LEVEL LAND CERTIFICATE INCREASES THE LIKELIHOOD HOUSEHOLDS ENGAGE IN LAND RENTAL AND SHARECROPPING ACTIVITIES

Indicators:

- A. Share of households engaging in land rental market activity
- B. Household average area of land rented
- C. Household average value per ha of rented land

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By type of rental activity: renting IN versus renting OUT
- 3) By number of wives: compare activity with 1 wife with households with 2 or more wives

Notes:

- 1) Average value of economic activity generated from land rental activity per household is calculated by multiplying the average area of land rented by the average value per ha of land.
- 2) The ELTAP and ELAP baseline collected aggregate values on rental activity for the household. The endline uses parcel rosters to collect information on rental activity. The endline parcel-level rosters on rental activity also distinguish between monetary and in-kind payments. Thus, the endline data allow for creating variables matching those in the ELTAP and ELAP baseline on activities involving monetary payment. Since in-kind payments were not captured or valued as part of baseline, assessing total economic value of rental activity (i.e. includes monetary as well as in-kind payments) will be limited to cross-sectional analysis involving endline data.

H-4: SECOND LEVEL LAND CERTIFICATION INCREASES HOUSEHOLD INVESTMENT IN PRODUCTIVE ASSETS – SHORT AND LONG-TERM

Indicators:

- A. Household average number of trees planted per ha
- B. Household average share of area planted to perennial crops
- C. Household average use of improved farm inputs per ha

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female.
- 2) By type of tree: fruit and non-fruit trees
- 3) By type of perennial crop: coffee, chat, enset, hops, sisal, bamboo
- 4)

Notes:

- 1) Control for number of trees received free of charge or planted in response to government requirement. Some of the farmers may have been required to plant trees as part of a government mandated conservation program (for example having land situated in a 'critical watershed area'). To account for this: i) the endline household questionnaire asks whether or not households were required to adopt water conservation measures; and ii) the community questionnaire asks if part of the community is located in a critical watershed and if members of the community have been required to adopt water conservation measures.

- 2) Number of trees per ha is based on total land holding.
- 3) Share is perennial crops divided by total cultivated area (includes rented land that is cultivated)
- 4) Where possible, assign values to inputs to allow computing of the total value of improved inputs per ha.

H-5: SECOND LEVEL LAND CERTIFICATION RESULTS IN HOUSEHOLDS HAVING HIGHER LEVELS OF AGRICULTURAL PRODUCTIVITY

Indicators:

- A.** Household average value of farm product per ha

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By type of income generating activity: crop production, livestock
- 3) By annual and perennial crop

Notes:

- 1) Control for communal pasture and shared grazing when estimating livestock productivity.
- 2) Developing a single measure – including for crop production or livestock broadly – requires assigning monetary values. The endline data collection obtains price information at the household and community level, while price information from the baseline will need to be extracted from household data or supplemented with historic price data that is locally relevant (i.e. sufficient spatial coverage) as appropriate. Where suitable and representative price data cannot be retrieved from the baseline data or obtained from another source, analysis will: i) focus on estimating impacts based on type of crop or livestock production as appropriate and given the available data; or ii) combine data (baseline, endline, and other sources) to impute locally-relevant baseline price data where gaps exist and use these to estimate baseline production values.
- 3) Total farm area including area rented in (less area rented out) is used to normalize.
- 4) Normalizing for crops is based on total cultivated area (includes land rented in).
- 5) Normalizing for livestock is based on non-cultivated land.
- 6) When valuing production, all farm products (those sold on the market as well as for home consumption) are assigned the same price to obtain the 'true' value (i.e. opportunity cost) of production.
- 7) Prices and income from baseline will be adjusted for inflation and values will be reported based on 2014 constant prices.

H-6: SECOND LEVEL LAND CERTIFICATION ENCOURAGES HOUSEHOLDS TO INVEST MORE IN SOIL AND WATER CONSERVATION (SWC).

Indicators:

- A.** Average length of hedges, bunds, and ditches constructed
- B.** Average length of soil bunds stabilized with vegetation
- C.** Average number of water retention structures constructed

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By type of hedge, bund (soil, stone), and soil ditches

Notes:

- 1) Control for whether the farm has land plots on sloped lands where soil erosion is a problem.
- 2) Some of the farmers may have been required to adopt soil and water conservation measures by the government (for example having land situated in a 'critical watershed area'). To account for this: i) the endline household questionnaire asks whether or not they were required to adopt water conservation measures; and ii) community questionnaire asks if part of the community is located in a critical watershed and if members of the community were required to adopt water conservation measures.

- 3) Considerations for whether household used its own (voluntary) resources and whether the structures are maintained by household or other party.
- 4) Control for use of irrigation in considering construction of water retention structures.
- 5) Length of hedge, bund, and ditch constructed combines the length attributable to the household without help as well as with help from others.
- 6) Number of on-farm water retention structures (ponds, retention ditches) constructed by the household itself (using its own resources) to date and existing.

H-7: HAVING A SECOND LEVEL LAND CERTIFICATE RESULTS IN STRONGER PERCEIVED TENURE SECURITY FOR WOMEN AND MEN

Indicators:

- A.** Share of households that believe land redistribution of land in the kebele is not likely in the next 5 years
- B.** Share of households that believe renting land is not risky
- C.** Share of households that believe a certificate secures land holding
- D.** Share of households that would prefer to engage in business activity with someone holding a certificate on their land
- E.** Share of households that think they will benefit in the future from soil and water conservation measures
- F.** Share of households that think they will benefit in the future from the trees planted
- G.** Average household security perception index (see notes)

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By rental horizon: one cropping season, five cropping seasons
- 3) By type of rental activity: renting IN versus renting OUT

Notes:

- 1) Analysis to control for population pressure (i.e. population density) as well as prior land redistribution activity (date of last redistribution) as appropriate and based on data availability.
- 2) Perception responses are based on a 4-category scale (strongly agree, agree, disagree, strongly disagree). For computing these indicators, response will be assigned 'YES' if response is agree or strongly agree, and 'NO' if responding with disagree or strongly disagree.
- 3) Average household security perception index is computed by assigning a value to each of the five questions that underly indicators (A-F). For each question a household will receive a value of 1 if the response was consistent with a strengthening of tenure security (i.e. responded with strongly agree or agree) and a value of 0 if response was consistent with weaker perceptions (i.e. disagree or strongly disagree). The household security perception index is computed as the simple average.

H-8: SECOND LEVEL LAND CERTIFICATION INCREASES THE EXTENT TO WHICH HOUSEHOLDS ENGAGE IN OFF-FARM INCOME GENERATING ACTIVITIES

Indicators:

- A.** Household average number of weeks members have been away from home to find work
- B.** Household average value of income earned by members that have left home

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female.

Notes:

- 1) The rationale underlying this hypotheses and indicators is that stronger land tenure empowers holders to temporarily transfer rights for use of their lands, allowing the landholder to engage in other economic activities without fear of losing their land.
- 2) This question and hypothesis directed at a narrow subset of the population who would like to engage in

off-farm activities. When testing this hypothesis, the results will be conditioned on responses from the ELTAP and ELAP baseline, which indicated that households would prefer to 'rent-out their land and engage in another job' when asked 'What would you like to do with the farmland under your possession in the future?'

H-9: SECOND LEVEL LAND CERTIFICATION INCREASES WOMEN'S INVOLVEMENT IN LAND MANAGEMENT AND DECISION MAKING ACTIVITIES

Indicators:

- A.** Share of wives with land in their name involved in household decision making regarding use of land
- B.** Share of wives who perceive/see land certification will enhance women's bargaining power within the household
- C.** Proportion of women who believe there are laws to adequately protect the land rights of women
- D.** Share of wives with land certification that think the certification will encourage them to rent-OUT their plot of land
- E.** Share of wives with land certification that think the land certification will positively impact their ability to negotiate whether or not they participate in the land rental market
- F.** Share of women renting out their land to a person that is not a close friend or relative

Disaggregation:

- 1) Type of household (polygamous, monogamous)
- 2) Household head: Female, Male

Notes:

- 1) The data used to compute these indicators is collected primarily through the wives survey. The revised version of the wives component of the household questionnaire includes a parcel roster and includes content to elicit the extent to which wives are engaged in decision making (i.e. what to grow, how production is used, whether or not to rent-out land, etc.).
- 2) For polygamous households, each wife's response is given equal weight and responses are not normalized based on the total number of wives in the household (i.e. a household with two wives would be treated as if they were two separate observations and given the same empirical weight as a wife from a monogamous household).

5.0 SAMPLING AND IDENTIFICATION

SAMPLE DESIGN

Testing the research hypotheses involves measuring indicator levels prior to program implementation (baseline) and comparing these with levels after the programs have ended (endline). The development of the baseline survey instruments, sample design, and collection of the baseline data used in measuring pre-program indicator levels were covered under the ELTAP and ELAP program activities implemented by TetraTech. Under contract from TetraTech, The Ethiopian Economics Association (EEA) carried out data collection activities and supported the development of the survey instruments and sample design. Since the baseline sample design, questionnaire content, and data collection were carried out previously, there are practical limitations with respect to the strategy used to identify and measure program impacts. Fortunately, the baseline covered a large number of households (4500) and included treatment as well as control households.

TABLE 2: TREATMENT AND CONTROL HOUSEHOLDS BY REGION

		Region				Total
		Amhara	Tigray	Oromia	SNNP	
ELTAP	Control	326	199	285	275	1,085
	Intervention	573	700	618	627	2,518
	Sub-total	899	899	903	902	3,603
ELAP	Control	38	76	76	76	266
	Intervention	38	190	266	190	684
	Sub-total	76	266	342	266	950
Total		975	1,165	1,245	1,168	4,553

Source: (Ethiopian Economics Association, 2008, 2013, and ERC based on dataset tabulations)

The endline data collection will involve conducting a sample of approximately 4500 households and adopting a matched-panel approach where interviewers return to the same households to collect the survey data.

ELTAP BASELINE

The ELTAP baseline by EEA was conducted in the 4th quarter of 2007 and included 3,600 households across the four focal regions. Although baseline data data was collected in the third year of the program, there was no surveying and registration activities in 2005 or 2006 (Table 1). Although parts of the sample might have been contaminated (i.e. households having received some portion of the land intervention treatment prior to the baseline data collection), this is not likely to be a major issue, especially since certificates were not issued until 2008. However, to the extent that some households

may have received some portion of the treatment prior to data collection, these households will be flagged, and the extent to which these data may be compromised for the purposes of evaluating program impacts will be assessed. A review of the program and survey documentation revealed that the selection of households was not fully random, since a systematic approach, rather than random selection, was used in selecting some of the sample *kebeles*. For example, the size of *kebeles* and logistic requirements in terms of travel and access to the *kebeles* were taken into consideration and spatially selected in the following manner: i) 3 program and 1 non-program *kebeles* were selected from those far away from *woreda* capitals and/or main roads; ii) 3 program and 1 non-program *kebeles* were selected from among those that were in a medium range distance from *woreda* capitals and/or from main roads; and iii) 2 program and 1 non-program *kebeles* that were close to (5 km) *woreda* capitals and/or main roads (Ethiopian Economics Association, 2008). Although we are beholden to the sample design and approach taken when collecting the baseline, knowing the selection process is useful as some of the selection bias resulting from this systematic selection can be controlled for when specifying the empirical model for analyzing the data.

ELAP BASELINE

The ELAP baseline household survey was conducted by EEA during the months of April and May 2012. The household survey instrument was largely the same as that used for the ELTAP baseline with additional coverage of key variables. In particular, the ELAP household survey instrument included additional questions capturing the use of a land certificate to obtain credit (through informal as well as formal means) and greater scope covering perceptions on the types of rights. Since the ELAP baseline survey was conducted in spring 2012, the household survey was not a 'true' baseline, since a large number of households would have been treated starting in 2009/10 (Table 1). Unlike ELTAP, where the introduction of program activities prior to the collection of the baseline is likely to be minimal and manageable, compromised baseline data is likely to be much more of an issue for ELAP households. In conducting the analysis, it will be important to identify which *kebeles* were surveyed at what times and when certificates were ultimately issued to assess whether or not those data can be used for the purposes of assessing program impacts. Like ELTAP, the selection of households and the areas being sampled during the ELAP baseline was not fully random. Under ELAP, 18 ELAP program *kebeles* were non-randomly selected from the sample *woredas* based on the recommendation of ELAP program management, as they had been identified as having high potential for agricultural investments. An additional 7 non-program *kebeles* were selected randomly to serve as control *kebeles* (Ethiopian Economics Association, 2013).

ANALYSIS AND IDENTIFICATION STRATEGY

Following the collection of the endline data and after merging this with the baseline data, the combined data will be analyzed using two methods: comparison of average outcomes and difference in differences. To the extent data are randomized, we can measure the impact of the interventions by comparing the average outcomes of individuals in the treatment group to those in the control group using data collected from baseline and endline surveys. We can further disaggregate to see if the intervention impacts differ by gender, economic status, or other categories as appropriate.

A second strategy involves difference-in-differences methods to test the robustness of the uncontrolled analyses (Ravallion, 2001). Difference-in-differences (DiD) estimates the impact by comparing the change in outcome for the treatment group with the change in outcome for the comparison group. This

method allows us to take into account any differences between the treatment and comparison groups that are constant over time. The two differences are thus before and after, and between the treatment and comparison groups. The difference-in-differences estimator controls for time-invariant social and environmental characteristics that might be correlated with both treatment status and outcomes. By comparing the difference in the control group from the treatment group, both constant factors, any time-varying factors common to both the control and treatment group will be removed from the measured impacts, resulting in a ‘cleaner’ estimate of impact with fewer confounding factors. The basic difference-in-differences model can be specified as a two-way fixed effect linear model:

$$y_{ijt} = aT_{jt} + \sum_k b_k X_{ijk} + c_j + d_t + \varepsilon_{ijt}$$

Where y_{ijt} is the outcome indicator variable for an individual i , located in cluster j , and in period t . T_{jt} is an indicator of whether the cluster j is part of the intervention group in period t , and a is the average impact of the intervention. (Where there are multiple intervention arms, the model would be adjusted, allowing for additional indicator variables.) The X is time varying control variables (such as family size, total income, number of children, etc.) with the b_k identifying their effects on the outcome, c_j is the cluster fixed effect, d_t is a time fixed effect, and ε_{ijt} is an error term.

The form of the outcome variable will determine the error structure of the linear model. For example, if the outcome y_{ijt} is income from agricultural activities, then we will specify an ordinary least squares model with a random error term that is normally distributed. If the outcome variable is the number of plots of rented land, then one would assume a negative binomial error distribution and use the total number of plots under production as an additional offset in the model. If the outcome variable is a binary variable (i.e. yes or no in response to whether or not a certificate has been used to secure access to micro-credit), then we would specify an appropriate model, such as the logit or probit. As well, for questions that have multiple responses, the model for handling ordered/ranked responses, as well as non-ordered responses, can be specified, for example as an ordered logit or multinomial logit, respectively.

LIMITATIONS AND IMPLICATIONS FOR ANALYSIS

Given the way the *kebeles* were selected for inclusion, selection bias will be a concern that will require a more thorough treatment. The DiD method assumes that time trends are similar in the comparison and treatment groups before and after the intervention takes place and starts to break down when areas are purposefully selected, such as being designated as ‘high potential’. In these instances, a more sophisticated econometric approach will be needed, and the appropriate approach can depend to a degree on the outcome indicator in questions and the extent to which bias will be an issue. Depending on the data and the specific indicator in question, candidates for analysis include propensity score matching, instrumental variables, as well as models that combine parametric and non-parametric methods to control for sample bias (Heckman, Ichimura, Smith, & Todd, 1998). Regardless of the econometric methods employed, collecting additional community information will be key in helping to assess the extent of the bias and the viable options for controlling for this.

The problem of having collected the baseline after the second level activities had begun in some areas will need to be addressed on a case-by-case basis. For ELTAP households, this is not likely to be an issue since, even though the data were collected in the 4th quarter of 2007, there was no surveying and registration activity in 2005 or 2006, and actual certificates were not issued until 2008. For ELAP, it will be more complicated and will require looking at the data in more detail. Depending on the extent to which the baseline data are 'contaminated', one option would be to disregard those observations/data points altogether. If this would result in omitting too many variables, a regression model incorporating continuous treatment specification may be appropriate. The community survey instrument developed for the endline (which was not part of the baseline) requests information on the timing of events related to the certification program (i.e. when activities started, first community engagement, etc.) and will be useful in determining what methodology is most appropriate moving forward.

6.0 SURVEY AND MANAGEMENT

SURVEY INSTRUMENTS

The endline data collection includes a general household survey including a separate wives component, a community-level key informant survey, and a short questionnaire administered to *woreda* land administration offices.

HOUSEHOLD SURVEY

Under ELTAP and ELAP, information was collected from households using two survey instruments: a general household survey and a wives survey. The household component involved collecting information on land holdings, production activities, land use, perceptions on land tenure security, etc., as applied to the household as a whole. The wives survey was administered to male-headed households with one or more wives. The wives survey instrument collects additional information to better understand differences and similarities between women and men and their perceptions of tenure security and land-use decisions.

The information collected during the baseline will have a major bearing on indicators used to measure changes overtime and to assess impact. As a result, the information collected from households as part of the endline draws heavily from what was collected under the ELTAP and ELAP baseline data collection. Although the two programs were implemented five years apart, the ELTAP and ELAP baseline surveys were generally the same in terms of both structure and the specific questions asked. There were some minor differences in content, with the ELAP baseline household instrument including additional content, such as on obtaining credit, which was not part of the ELTAP baseline. The endline household instruments include these additional changes in addition to a number of significant revisions. The endline household instruments incorporate the following changes and additions:

- Additional parcel-level detail on household land holdings, land rental and sharecropping activity, land-related disagreements, use of land to obtain credit, temporary and permanent changes in land tenure, and whether or not these changes have been registered.
- Questions on accessibility of the *woreda* land administration office (i.e. distance to and costs associated with visiting the land administration office).
- The wives survey component includes parcel rosters to provide detail on decision making over land use and management and disagreements.
- Additional household details, including global position system (GPS) coordinates (latitude and longitude) and follow-up contact information (i.e. mobile phone).

Note that in revising the endline household instruments to provide additional detail, care was taken to ensure this information can be used to impute an endline value that can be compared with the baseline

responses. For example, in assessing the impact on rental market activity, one of the indicators is the amount of land the household rents out. In the baseline, a single question captures total amount of land rented out, while in the endline households indicate on a parcel-by-parcel basis which plots they have rented out. In this case, to create a variable comparable to the baseline value, one simply sums over all parcels rented out by the household. Although the additional parcel detail will not be directly comparable with baseline, this approach results in more precise estimates and allows for the possibility of cross-sectional analysis methods in addition to the type of analysis and identification strategy discussed in the previous section. The additional parcel-level detail also allows for future implementation of a performance evaluation component by noting parcel-by-parcel changes in land tenure status that should be recorded in the registry (revise ownership, transfer, death/inheritance, etc.) and whether households have taken steps to register these changes, which would allow for cross-referencing with the records at the *woreda* land administration office to see if those changes have been recorded.

The time taken to complete a household interview as part of the ELTAP and ELAP baselines is reported to have taken 4-6 hours. In an effort to reduce the time required to complete an interview, non-essential and low-priority content from the baseline is excluded from the endline. The endline survey when administered to households is expected to take between 2-4 hours.

In addition to the household survey instrument, the endline data collection for ELTAP and ELAP will include two new instruments, including a community key informant interview and a *woreda* land administration questionnaire.

COMMUNITY KEY INFORMANT

The community key informant interview will be administered to key informants in approximately 250 villages. The instrument is used to collect community-level information on the following:

- Price information
- Access to basic services
- Sources of employment and typical wages
- Agricultural activities
- Land administration
- Time of first and/or second level certification

The time estimated to complete a single key informant interview is approximately 1-2 hours.

WOREDA LAND ADMINISTRATION OFFICE SURVEY

The *woreda* land administration questionnaire will be administered in approximately 30 to 35 *woreda*, and is designed to collect a limited amount of information on fees and services offered by *woreda* land administration offices. More specifically, the *woreda* land administration questionnaire collects the following types information:

- The cost associated with obtaining a new land certificate

- The out of pocket costs associated with permanent (divorce, inheritance, etc.) and temporary (sharecropping, renting-out, etc.) changes in land ownership
- The number of trips to the woreda land administration office required to complete a land administration activity
- How first and second level joint certification are confirmed between a husband and wife in the woreda

PROTECTION OF HUMAN SUBJECTS AND INSTITUTIONAL REVIEW BOARD

All data collection activities will adhere to professional and ethical standards for the treatment of human subjects. The evaluation team will submit the proposed impact evaluation to the Institutional Review Boards (IRB) at Clark University. The IRB is an ethics body in charge of overseeing and monitoring research activities involving human subjects. The IRB's main role is to ensure that research procedures do not pose more than negligible risk to the participant subjects and to assess the adequacy of safeguards to protect subjects' rights, welfare, and dignity. Researchers are required by the IRB to: (1) inform the subjects about the purpose, risks, and benefits of the study so that they can make an informed decision about whether or not to participate in the research and (2) protect the anonymity of subjects and the confidentiality of the data.

Even though this activity involves surveying individuals covered under the baseline survey and involves questions exactly or very similar to those used earlier, a review will be conducted to ensure the activities "... conform to legal and other requirements governing research with human subjects in the country where it is conducted" (pg 3 [d] USAID, 2006). The evaluation will conform to the legal and other requirements governing research with human subjects in Ethiopia. Although there is no formal IRB requirement in Ethiopia, or official regulations regarding conducting household surveys, it is common practice to receive a letter of approval for conducting the survey from the relative ministry (Ministry of Agriculture) and from the local and Regional governments.

Furthermore, the research team will provide training to all enumerators and qualitative researchers to ensure they understand these principles. Upon completion of research activities in the field, the data will be maintained in a way that adheres to general IRB principles. All analyses and publications will respect the anonymity of respondents; no identifying information will be used in reports or presentations. The mode of analysis will follow econometric standards for survey research, the aim of which is to make general claims about the participant and non-participant populations, not specific claims about identifiable individuals.

SURVEY FIRM

ERC will be issuing a competitive request for proposals (RFP) for the endline data collection. The RFP will be issued in July with plans to have the proposals returned early August. A technical review panel will independently score the proposals received according to the technical guidelines developed prior to the issuance and included with the RFP. Following the independent review, the panel will meet to discuss and request additional information as needed before providing a review and ranking of the prospective firms. A financial review panel will also independently review required information. Meetings of the

technical and financial review panels will be held prior to final selection. The selected firm will be notified of the winning bid at the end of August. Firms submitting, yet not selected, will also be notified.

TABLET-BASED DATA COLLECTION

The endline data collection will be carried out using a tablet-based approach. While there is additional up-front effort required to program the questionnaire, train staff and enumerators on the use of tablets, and manage the tablets and hardware to limit complications in the field, there are a number of clear benefits. In general, a tablet-based approach reduces data entry errors and improves the quality of the data (Caeyers, Chalmers, & De Weerd, 2010). Most software includes functionality that allows for validating results, pre-populating entries based on prior information (i.e. household roster from a baseline survey), and routing capabilities that modify the information collected based on prior responses. While most survey software packages have these capabilities to some extent, the level of computer literacy and programming skill can vary considerably. The capability for consolidating and merging data from the household interviews and suitability for organizing data from lengthy questionnaires also vary considerably. Key considerations in selecting a software-hardware solution for this endline data collection were the ability to handle and organize a large amount of data given the relatively long survey instrument (estimate 4-6 hours to complete a household survey) and the ease with which the questionnaire could be programmed into the software.

TABLET USE AGREEMENT AND LOGISTICS

Tablets used for conducting the survey will be provided by Cloudburst to the Survey Firm if necessary. Ideally, the Survey Firm would have their own tablets for conducting the survey and have developed in-house capacity. To address this while at the same time helping to build capacity with the firm in-country, it was decided that Cloudburst would purchase and procure any necessary electronic devices plus any additional accessories through ERC. The procurement will be a one-time cost that, while being incurred mainly under this Task, can be leveraged against future data collection activities. Future data collection applies to those in Ethiopia as well as under other ERC tasks requiring data collection.

Frequent communication and coordination between the Survey Firm and the ERC IE team will be required to make sure the technology is available and ensure sufficient training and troubleshooting has taken place to ensure final data collection is carried out in a timely and efficient manner. The number of enumerators and field teams must be known as early as possible to ensure the tablets can be provided to the Survey Firm in a timely and efficient manner. Prior to any training or field activities sufficient piloting of the hardware should be carried out to ensure the hardware and software meets the necessary requirements. Changes to the questionnaires and programming into the survey software must take into consideration the time and effort necessary to test the updated version and ensure all tablets have been uploaded with the most current version of the questionnaire. Modifications or additions to the hardware and accessories will take considerably more time due to the logistics associated with sourcing, procuring, and locating a large number of devices/accessories. As such, pre-piloting and testing of the technology package should take place well in advance. ERC IE team with input from the Survey Firm will develop a plan for addressing the logistical challenges.

A Tablet Use Agreement allowing the Survey Firm to take possession of the tablets and accessories will need to consider:

- Terms for taking possession of the tablets and accessories from Cloudburst;

- When the Survey Firm takes possession of the tablets and accessories;
- Number of tablets and any necessary accessories (i.e. external battery, protective case, stylus, etc.);
- Storage and monitoring of the tablets when not in use;
- Management and tracking of the tablets when in use ;
- Responsibility and care while in possession of the Survey Firm; and
- Return of tablets to Cloudburst and the ERC IE team following data collection (including terms for withholding final payment until all devices and accessories have been returned to Cloudburst in working order or deducting the value of the tablet and accessory replacement in the case of non-return or damage).

INSTRUMENT PROGRAMMING

The ERC team will program the questionnaire into the survey software to allow for collection using mobile/tablet devices. To the extent possible, the tablet-based approach will incorporate the built-in functionality of the software to reduce errors in data entry (i.e. validation checks), pre-populate fields of the questionnaire based on prior round of household data collection (i.e. household roster information such as names from the ELTAP or ELAP baseline survey), and build in routing capabilities to improve efficiency of the data collection and reduce the potential for errors (i.e. collecting information on crop inputs and production only on plots of land which are under cultivation). Following the initial adaptation of the questionnaire to the survey software, the Survey Firm will ensure the questionnaire is translated into the local language (the survey software allows for switching between English and local languages). Ensuring the devices and programming meets the necessary field and language requirements will be the responsibility of the selected Survey Firm. Testing and revising of the software will be carried out on an ongoing basis and it will be important that the Survey Firm has an individual dedicated to programming the questionnaire into the software and building sufficient capacity in the use of tablets to allow for trouble shooting of potential problems as they arise in training exercises as well as when being implemented in the field.

DATA MANAGEMENT

Using electronic devices for data entry during the course of a household survey to populate a central dataset, the need for data entry personnel to transcribe paper entries is virtually eliminated. However, to make sure the data is organized and documented appropriately requires careful management and monitoring. This entails appropriate attention to setting up the database structure and shell for recording data, monitoring the data as it comes in from the field and identifying problems/issues as they arise, and creation of the final dataset complete with documentation. Since this is an endline survey, a catalog of variables and correspondences with baseline data will also be required. The baseline here consists of two datasets – ELTAP and ELAP – that will need to be reconciled (i.e. adopt a common set of variable names and identifiers and flagging questions that are in one dataset but not the other) to allow merging with the endline dataset. A final data dictionary will clearly document and describe the final dataset and information on each of the data files.

The data management plan developed with the Survey firm and will include:

- Coding strategy in order to maintain consistent, unique identifiers for households for matching longitudinal data (i.e. common variable names for matching across ELTAP/ELAP baseline data with the endline dataset and documenting clearly);
- Specify which variables from the baseline surveys (ELTAP and ELAP) will be used to pre-populate fields in the survey questionnaire;
- Working with survey programmer(s) to adapt data entry range and consistency checks to values appropriate for the country context, based on existing HH survey data (i.e. if age of household head was 35 at time of baseline for ELTAP in 2007, then validation error if age in 2014 is less than 41 or greater than 43);
- To the greatest extent possible, the data entry program should conduct range and consistency checks, in real-time as the data from each questionnaire is entered;
- The program should allow valid open-ended and “other” textual responses outside of the response options provided in the questionnaire; and
- Variable names generated by the program should correspond clearly and logically to the question labels used in the questionnaire.

7.0 DELIVERABLES

IMPACT EVALUATION REPORT

The endline report and associated analysis will be completed approximately six weeks following receipt of the final dataset. The impact evaluation report will report both the effects of the treatments versus controls, and the effects of each of the types of treatments vis-à-vis one another on the outcomes of interest. In addition to investigating average treatment effects, the report will also include a discussion of heterogeneous treatment effects to the extent possible. The report will also include the results of cross-sectional analysis of data collected at the endline that were not included in the baseline data collection. The analysis in the impact evaluation report will follow the plan outlined in the baseline report.

POLICY BRIEF

We will prepare a policy brief of approximately 10 pages that highlights the most policy-relevant findings from the evaluation. This brief will be completed following the endline analysis.

FULLY DOCUMENTED DATA SETS

We will deposit fully documented data sets with USAID LTD following the final round of data collection. The format, reporting detail, and organization of the data and any documentation will conform to the general reporting standards to be adopted for all data collected under the ERC Task Order. Along with reporting standards, safeguards will be implemented to ensure personally identifiable or otherwise sensitive information is removed prior to being made public. The fully documented datasets will be made public following approval from USAID LTD.

8.0 TIMELINE OF ACTIVITIES

Activity	2013					2014												2015				
	S	O	N	D		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M
IE Design																						
Preliminary stock taking of documents and data																						
Scoping trip																						
Refine research questions, specify indicators																						
IE design for review																						
SOW for data collection developed																						
Prepare budget																						
LTD review of IE design																						
LTD Approval of IE Design																						
Survey Preparation																						
Contract signed with survey firm																						
Adaptation of survey questionnaire to tablet software																						
Trip - work planning, device testing, training																						
Questionnaire development and translation																						
Secure devices and other equipment																						
Field work and data management planning																						
Survey Implementation																						
Field staff recruitment and selection																						
Training of field staff																						
Field work and data entry																						
Dataset creation, documentation, and delivery																						
Final field report from survey firm																						
Analysis and reporting																						
Draft report and preliminary analysis																						
Final report																						

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9.0 APPENDICES

APPENDIX 1: HOUSEHOLD QUESTIONNAIRE

[see file]

APPENDIX 2: WIVES QUESTIONNAIRE

[see file]

APPENDIX 3: COMMUNITY QUESTIONNAIRE

[see file]

APPENDIX 4: WOREDA LAND ADMINISTRATION OFFICE QUESTIONNAIRE

[see file]

DRAFT

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ANNEX VIII—DATABASES

The fully documented, cleaned, and finalized datasets for the ELTAP/ELAP IE Baseline and Endline data collections are currently being reviewed by a third-party. The datasets in their current state, pre-review, can be accessed via the USAID LTRM Document Approval Tracking System (DATS) at the following link: <http://usaidlandtenure.net/DATS/eltapelap-datasets-msi-review>.

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