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Ethiopia Strengthening Land Tenure and Administration Program Follow-On Report: An Impact Evaluation of Long-Term Effects of Second-level Land Certification

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ETHIOPIA STRENGTHENING LAND TENURE AND ADMINISTRATION PROGRAM FOLLOW-ON REPORT: AN IMPACT EVALUATION OF LONG-TERM EFFECTS OF SECOND-LEVEL LAND CERTIFICATION

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LIST OF ACRONYMS

ATE	Average Treatment Effect
CEL	Communications, Evidence, and Learning project (USAID)
CSA	Climate Smart Agriculture
CT	Continuous Treatment
CTG	Comparison Treatment Group
DFID	Department for International Development
DHS	Demographic and Health Survey
DID	Difference-in-Differences
DHS	Demographic and Health Survey
D/MHH	Dual- or male-headed household
ELAP	Ethiopia Land Administration Program
ELTAP	Ethiopia Land Tenure Administration Program
FCDO	Foreign, Commonwealth & Development Office (UK)
FGD	Focus Group Discussion
FHH	Female-headed household
FLLC	First-level land certificates
GoE	Government of Ethiopia
IE	Impact Evaluation
IPV	Intimate partner violence
IRB	Institutional Review Board
KAS	*Kebele* Authority Survey
KII	Key informant interview
LIFT	Land Investment for Transformation
MDES	Minimum detectable effect size
MFI	Microfinance institution
REILA	Responsible and Innovative Land Investment Project
SLLC	Second-level land certificates
SNNP	Southern Nations, Nationalities, and Peoples' Region
USAID	United States Agency for International Development

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EXECUTIVE SUMMARY

This report presents findings from an evaluation of long-term impacts of the highly innovative and cost-effective Ethiopian land certification program that took place between 2005 and 2020. We assess certification's impacts on tenure security, agricultural investment, leveraging land for credit or rental, and women's empowerment for up to 17 years for any land certification and up to 14 years for second-level certification. The evaluation adds to the evidence base on land tenure's roles in rural development and can inform the design of registration and other land programming to improve the well-being of rural land users in Ethiopia. Specifically, it contributes to an evidence gap on long-term effects of land programming, which is especially important for outcomes such as large agricultural investments or women's empowerment which are theorized to take more time to occur. This evaluation also enables greater visibility into the timing of when effects occurred, their duration, and their size at different points in time.

In 1998, the Government of Ethiopia (GoE) embarked on a rural land registration program to certify the long-term use rights of rural households in the four rural highlands regions – Tigray, Amhara, Oromia, and the SNNP. The certification effort was partially motivated by an intention to increase tenure security after a history of land reallocations. This effort, now referred to as "first-level certification," provided households with certificates of use rights.

In 2005, the GoE began implementing second-level certification, including through the USAID-supported activities Ethiopia Land Tenure Administration Program (ELTAP, 2005-2008) and the Ethiopia Land Administration Program (ELAP, 2008-2013). Second-level certificates differ from first-level certificates in that they are at the parcel level, have accompanying maps with more detailed spatial data, and are registered digitally with provincial government. ELTAP, ELAP, and other second-level certification efforts included activities to educate communities, land administration, and land governance institutions on women's land rights, as well as engage women in the second-level certification process and promote joint certification. Some second-level certification programs also linked certification with different complementary services such as access to finance.

This evaluation's overarching research questions are:

Q1) What are the long-term effects of receiving land certification on well-being and economic outcomes for households? How do these differ by household characteristics such as gender of the household head, poverty status, or region?

Q2) How do the impacts of certification on the various outcomes unfold over time? Which (if any) impacts occur in the short-term, but are not sustained? Which (if any) impacts are not observed in the short term, but occur over longer periods of time?

Q3) What are the effects of receiving land certification on wives' land ownership and decision-making about land in dual/male-headed households in rural Ethiopia?

Q4) What are the effects of receiving land certification on the risk of women experiencing intimate partner violence (IPV) in male-headed households in rural Ethiopia? If so, why?

Q5) Are women who have certificates in their names better able to solve land-related conflicts? What are the main barriers preventing women from accessing justice when they experience a land conflict?

METHODS

This evaluation uses survey data that followed the same set of households in 2008, 2015, and 2021 in the Amhara, Oromia, and SNNP Regions where ELTAP and ELAP were implemented. The 2021 survey does not include Tigray and part of Amhara due to conflict at the time of data collection. It also excluded households that were selected for ELAP based on their agricultural productivity potential. Each survey round interviewed heads of household, and if present, interviewed the head's wife/wives separately. The full 2021 survey sample includes 2,306 households in the Amhara, Oromia and SNNP Regions. Twenty-one focus group discussions (FGDs) with women and men gathered their perspectives on the benefits and limitations of having land certificates and provided context for the research questions and hypotheses.

We evaluate impacts of certification on 33 variables across the following 8 outcome families:

- Credit access
- Land disputes
- Land rental
- Agricultural investment
- Soil and water conservation
- Perceived tenure security
- Wives' possession of and decision-making over land
- Wives' experience of IPV

We use the same definitions of outcome variables as Cloudburst's 2016 impact evaluation covering 2008 to 2015, with some exceptions discussed in the methods section. We analyzed the panel survey data across the 2008, 2015, and 2021 rounds as follows:

Differences-in-differences (DID) analysis replicated Cloudburst's evaluation of the effect of households receiving or being surveyed for a second-level certificate compared to households having a first-level certificate or no certificate. In this study, we update Cloudburst's earlier analysis, which compared data from 2008 to 2015, to analyze the period from 2008 to 2021. A household is in the treatment group if they have a second-level certificate for any plot of land or if any of their plots have been surveyed for a second-level certificate.

For a more nuanced understanding of when effects of certification occurred and how they changed over time, we applied continuous treatment analysis (CT) to assess the effects of the number of years a household has had a certificate. We analyze the effects of years since certification using two definitions of treatment: 1) years since households first received a second-level certificate on any plot of land and, 2) years since households first received either a first- or second-level certificate. For household-level variables, we estimate the equations first on the 2,059 households that were in all three survey rounds and then for separate subgroups of female-headed households (FHH) and dual- or male-headed households (D/MHH). For wife-level outcomes, we estimate the equations for the 657 wives who appeared in all three survey rounds.

We used the 2021 survey data and matched estimates from Ethiopia's 2016 Demographic and Health Survey (DHS) to estimate associations of households having land certificates and wives having their names on certificates with the probability of wives experiencing emotional IPV, physical or sexual IPV, and any IPV in the 12 months prior to the survey. In one approach we estimated the effect of second-level certification on wives' probabilities of experiencing IPV using the 2021 round of survey data (the comparison group for any certification was too small for meaningful analysis). A second approach leveraged the 2016 DHS data to create a comparison group and used any certification as the treatment because the DHS does not distinguish the type of certification. We used the ELTAP 2021 survey data to identify a predictive model for wives having a land certificate; applied the model households in Amhara, Oromia, and SNNP in the DHS dataset to estimate propensity scores for certification; and then estimated the association with IPV by matching observations from the ELTAP 2021 dataset to their nearest neighbors in the DHS sample.

Readers should be mindful of several limitations of this evaluation. First, between 2020 and 2021, Ethiopia experienced COVID-19 and political conflict that reduced the sample size of the 2021 dataset and may have reduced access to agricultural inputs and markets and increased IPV, although examination of effects is still nascent. Second, the 2008 baseline survey did not collect parcel-level data for several outcomes, including agricultural inputs, investment, production, and market activity. This limits our ability to rigorously assess certain field-based measures using the 2008 data. Third, our analysis does not deeply examine the processes of second-level land certification (SLLC) or attempt to differentiate the effects of different components of SLLC programs on the outcomes.

We also caution readers who may want to compare the results in this report of long-term impacts against the impacts presented in the earlier Cloudburst ELTAP/ELAP endline report (2016). Despite using the same definitions of treatment and comparison groups, the samples in the DID analyses are different between the reports because some households received second-level certificates in the intervening time and because the 2021 sample does not include Tigray, areas of Amhara region, or ELAP households.

KEY FINDINGS

The results across different analytical approaches suggest several positive long-term impacts of certification. For the continuous treatment analysis, we observe long-term impacts of any land certification up to 17 years and up to 14 years for second-level certification.

PERCEIVED TENURE SECURITY: Impacts of certification on tenure security differ by how perceived tenure security is measured. Qualitative findings suggest that people perceived greater security because of certification, especially for women, and are more concerned about loss of land from development or corruption. The quantitative findings show that having any certificates and having a second-level certificate initially increase perceived tenure security but after 10 to 12 years we observe a decrease in perceived security measured by perceived likelihood of future land redistributions, mainly among dual- or male-headed households. Over 2008-2021, second-level certificates decreased perceptions of likely redistribution by about 2.6 percentage points, contributing to the overall decline in the percentage of households anticipating another land redistribution from 24 percent to 10 percent.

CREDIT: Only 67 households in 2015 and 32 households in 2021 accessed credit through a land certificate. The small sample size suggests negligible impact of certification on credit access. Given the small sample size we are cautious to draw conclusions with respect to the impact of certification. Second-level certification may increase the likelihood of households obtaining credit using land as collateral. However, it does not affect the amount of loans obtained and the increase in credit is more applicable to dual- or male-headed households than female-headed households. For households with second-level certificates the probability of obtaining credit may increase until peaking at 3 percentage points 5 years after receiving a certificate. The effect declines after year 5, reaching 0 at year 11 and, continuing to decline. This pattern is driven by dual- or male-headed households. Any certification may decrease the loan size taken by female-headed households.

DISPUTE RESOLUTION: Certification reduces dispute resolution time, and more so for female-headed households and households farther from regional capitals. The reduction in dispute resolution time continues until 16 years after receiving any certificate, when dispute resolution time has decreased by more than 23 days. Dispute resolution time decreases more rapidly with any certification among female-headed households. Second-level certification even more dramatically reduces dispute resolution time for female-headed households. The FGDs suggest a common perception among participants that land certification has helped reduce the probability of experiencing land disputes.

RENTING OUT LAND: Second-level certification increases the number of parcels rented out, the area rented out, and the probability of renting out land. This is the case mainly among dual- or male-headed households. The impact of having a second-level certificate increases the probability of renting out in a non-linear way: the effect peaks at a 4.2 percentage point increase at year 6. Over time, female-headed households with any certificate, as opposed to second-level certificates particularly, were more likely to rent out land. After one year with any certification, Female-headed households are 2.3 percentage points more likely to rent out land. This effect peaks at year 12 for an increase of 14.4 percentage points. First-level certificates may have created sufficient clarity and security to increase female household head's comfort and ability to rent out.

AGRICULTURAL INPUTS AND INVESTMENTS: Many of the findings on agricultural inputs are counterintuitive, not consistent by certification type (any or second-level), or statistically significant regardless of the household head's gender and should be explored further. Possible explanations include changes in production away from crops for which improved seeds were available (or preferred) in the short-term, shifts towards crops that are typically cultivated with less fertilizer, or increased fallowing. In FGDs farmers' consistently noted difficulties in obtaining inputs, such as long distances to markets where they are available, lack of credit, and limited access to capital. Second-level certification does appear to increase planting perennials shortly after certification. Second-level certification initially increases the number of perennials planted, peaking at 21 additional perennial plants 3 years after receiving a second-level certification before having a negative impact by 6 years after certification. The initial investment in perennials shortly after certification reduces the need for additional planting in later years.

SOIL AND WATER CONSERVATION: Having any certificate increases the probability that households invest in soil and water conservation, and dramatically so among female-headed households. Eight years after receiving any certificate, female household heads were on average just as likely as dual- or male-headed households to make soil and water conservation investments, closing an approximate gap of 20 percentage points. Across the entire sample we do not find a statistically significant effect of second-

level certification on investment in soil or water conservation measures using DID or CT estimates. However, second-level certification increases the probability of soil or water conservation among households headed by widows by 46.8 percentage points. Further analysis with the ELTAP/ELAP dataset that control for whether households are located in areas where policies mandate land soil and conservation investment and new qualitative data could help understand the differences between female-headed households' and dual- or male-headed households' responses to certification.

WIVES' LANDHOLDINGS: Second-level certification's efforts to promote joint registration increased the likelihoods that wives had land and had documented land rights, strengthening their legal, if not social, claim to land. However, the effects eventually decline, and the impacts are primarily for land in wives' joint possession with men, with no impact on land owned solely by women. For example, after 10 years of her household having a second-level certificate, a wife would on average possess 0.48 additional hectares either solely or jointly.

WIVES' DECISION-MAKING OVER LAND: The percentage of wives with decision-making over land increased over time, but certification's contribution to the increase is unclear. Impacts of second-level certification on women's decision-making about land require further study.

IPV: A wife having her name on a land certificate, not the household having a certificate, is associated with lower risk of emotional IPV. Wives whose households have a second-level land certificate are 12 percentage points more likely to experience emotional violence compared to a mean probability of 41 percent. However, the wife having her name on the certificate effectively counteracts this increased risk, lowering the probability of experiencing emotional violence by 13 percentage points.

CERTIFICATION DID NOT AFFECT ALL HOUSEHOLDS OR WIVES EQUALLY

Dual- or male-headed households and households with older heads were more likely to experience statistically significant positive effects on several credit and rental outcomes from second-level certification. Improvements in dispute resolution time from certification were more pronounced among female-headed households. Households that were farther from regional capitals or urban centers experienced larger improvements in dispute resolution time and increases in renting out land.

Outcomes for female-headed households were often more responsive to any certification than to second-level certification specifically. Female-headed households were more likely to rent out land and, especially among widow-headed households, increased investment in soil and water conservation over time. Dual- or male-headed households had no observable response to any certification in these categories. First-level certification may have created sufficient clarity and security for some female household head's comfort and ability to rent out land and make investments; or second-level may not have brought markedly more clarity to encourage more female heads to change rental or investment behaviors.

Wives in polygynous marriages experienced negative impacts on land ownership and decision-making.

POLICY RECOMMENDATIONS

Policy recommendations emphasize actions to maintain and expand the beneficial long-term impacts of certification for rural women and men and respond to smallholders' concerns about agricultural inputs and local land governance.

1. Land certification efforts in Ethiopia and elsewhere should incorporate approaches to improve the availability, accessibility, and relevance of agricultural inputs and services to women and men smallholder farmers. We recommend further investment in the accessibility of agricultural inputs and investments and intentionally linking them to any land certification efforts. Linkages can be direct — for example, an activity/project could partially de-risk loans that offer better terms to certificate holders — or a more facilitative approach to improve service delivery in geographies where certification is taking place. The UK Aid-funded Land Investment for Transformation (LIFT) program offers several promising examples for making credit and rental markets more accessible to smallholder farmers to leverage their certified land rights.

2. Land registration programming should emphasize registering land, both agricultural and residential, in women's names, both to uphold women's land rights and to potentially protect against IPV. Given that land certification programs have the potential to intensify IPV, it is critical for land formalization programs to conduct assessments to understand initial levels of IPV, potential risks associated with programming, and existing services. Programming should prepare referral protocols and train staff in their use. Programming also needs to continue to raise awareness and social acceptance that regardless of marital status, women can be either joint or sole registrants and do not have to be married or household heads to have their names on a certificate. Land programming should also deliberately address social norms that dampen women's decision-making over land use and agricultural production.

3. For certificate holders to reap the benefits of second-level certificates, certificates need to be up-to-date and readily accessible to households and individuals. Government investments in delivering existing second-level certificates and processes to update the names on certificates as people bequeath, subdivide, or otherwise transfer their rights are needed to ensure the continued benefits of certification.

4. Investigate the need for increased oversight of land management committees, other duty bearers, and decision-making and implementation around urban development and communities' understanding of how these actors and decisions are expected to function according to the law.

The evaluation also serves as a reminder of the value of collecting longitudinal parcel-level and individual-level data on land tenure, decisions, and outcomes. To examine the complex, multi-step relationship of certification's impact on yields at a minimum requires data on the quantity produced of each crop as well as the area planted with each crop, which the surveys did not do. Ideally, this would be done for each parcel to link the parcel's certification status and whose names are on the certificate with the identity of the parcel manager(s) and yields. Future longitudinal surveys should also follow individual women and men with their own unique identifiers to better understand gendered land tenure over time and how their decisions, options, and well-being change. The differences in husbands' and wives' perceptions of women's land rights are reminders of the importance of self-reported data and the need to account for intra-household dynamics in understanding women's land rights.

I. INTRODUCTION

Over the last 50 years, the Government of Ethiopia (GoE) has enacted multiple sweeping changes to its land policies and legal frameworks. The Ethiopian land reform in 1975 changed the tenure system by making all land state property and allocating user rights to households based on household size (Holden et al. 2010). Beyond changing the ownership of the means of production and foundation of livelihoods, the policy catalyzed the development of new social structures through the creation of peasant associations from the *woreda*[1] to the regional government (Ottaway 1977). Following a change in national government in 1991, regional governments gained the ability to adapt the national policy to their contexts in 1995 (Holden et al. 2011). This allowed the Tigray Region to start a process of rural land certification in 1998 that was followed by the Amhara Region in 2003 and by Oromia and the Southern Nations, Nationalities, and Peoples' Region (SNNP) in 2004 (Solomon et al. 2006; Behaylu et al. 2015). The first programs of rural land certification, called first-level certification, took place in the 1990s and early 2000s, and registered, at low cost, land use rights to parcels for approximately 12 million households (Hailu and Harris 2013). In the following years and with support from international donors, the GoE pursued "second-level" land certification, which added parcel-level mapping and a computerized land registration system, among other features, at scale.[2]

The United States Agency for International Development (USAID) has provided substantial support for second-level land certification efforts in Tigray, Amhara, Oromia, and SNNP[3] Regions. Specifically, USAID funded the Ethiopia Land Tenure and Administration Program (ELTAP) during 2005-2008. ELTAP worked with Ethiopian regional and woreda-level land administration agencies to map, register, and certify land, and other activities to strengthen land governance. Through the end of ELTAP in May 2008, the program visited 147,449 households and mapped the boundaries of 704,754 parcels using GPS devices. Only 56 percent of the parcels mapped under ELTAP received their second-level certificates in 2008. The second USAID program, designed as a successor to ELTAP, was the Ethiopia Land Administration Program (ELAP) (2008-2013). ELAP completed the certification process for many of the households that had not finalized the certification process of rural land under ELTAP. ELAP certified 192,184 parcels from 89,178 households (USAID 2013). The United Kingdom UK Aid-funded Land Investment for Transformation (LIFT) project (2013-2021) was a larger-scale second-level certification program that also included complementary services for certified participants to improve access to credit, agricultural inputs, and land rental markets. From 2014 to 2021, the LIFT program provided 14.3 million second-level land certificates to over 5 million households in 175 *woredas* in the same regions as ELTAP and ELAP (Holden and Neumann 2021).

In 2016, Cloudburst Consulting completed an impact evaluation (IE) commissioned by USAID to understand the impacts of the ELTAP and ELAP land certification programs on beneficiaries' economic outcomes and well-being. Applying difference-in-differences analysis to a panel survey of households collected in 2008 and 2015, Cloudburst's evaluation found that the second-level certification programs led to a small increase in access to credit, a modest increase in tenure security, and a sizable increase in women's empowerment measures. However, contrary to the programs' expectations, the evaluation did

[1] In Ethiopia, regions are divided into *woredas* (administrative districts). *Woredas* contain *kebeles* (villages).
[2] It should be noted that the description of this land registration applies only to rural land, not to urban land.
[3] In 2020, some *kebeles* in the jurisdiction of SNNP were incorporated into the new Sidama Region.

not find evidence of increased land rental activity, increased investments in soil and water conservation, or reduced land disputes. Arguably, more time needed to pass for the programs' impacts on behaviors, markets, and governance to materialize (Cloudburst 2016; Lisher 2019).

In 2019, USAID commissioned Landesa to conduct a follow-on impact evaluation (IE) of ELTAP and ELAP. Beyond understanding long-term impacts of the substantial GoE and USAID investments in ELTAP and ELAP, this IE begins to address a significant gap in the land tenure literature on long-term impacts of land tenure programming. To our knowledge, this study is the first to consider the long-term impacts of land rights certification in a rural agricultural setting and examine how the length of time a household has held a certificate affects investment and other outcomes. Through USAID's Communications, Evaluation, and Learning (CEL) activity, in 2021, Landesa surveyed the same households surveyed in 2008 and 2015, except for households in areas experiencing conflict – the Tigray Region and 12 *kebeles* in Amhara Region – and households that received second-level certification through ELAP.[4]

This evidence can enhance programming to improve the well-being of rural land users in Ethiopia. Results indicate that second-level certification efforts has not affected all persons equally – gendered headship, heads' age, and household location being mediating factors. However, the analysis of the women empowerment indicators suggests that land certification can increase women's resources and bargaining power within marriage.

[4] Of the 4,326 households surveyed at baseline in 2008, 2,306 (or 53.3%) were also interviewed in the follow-on survey in 2021. More details about the sample can be found in the Methods section of this report.

II. EVALUATION DESCRIPTION

The goal of this study is to assess the long-term[5] impact of formalizing land rights on tenure security, agricultural investment, leveraging land for credit or rental, and women's empowerment. We build on Cloudburst's 2016 impact evaluation of the ELTAP and ELAP second-level certification programs and use data that span a 13-year period to (a) test whether the outcomes observed by Cloudburst have been sustained and how they evolved; (b) test whether the other expected outcomes have materialized now that more time has passed and; (c) better understand differential impacts of formalization on wives' decision-making power and on women's risk of experiencing IPV[6].

The study relies on four quantitative datasets and qualitative data:

- Cloudburst's panel of household data and wives' data collected in 2008 (4,326 households, 3,560 wives) and 2015 (4,332 households, 3,177 wives)
- Data on the same households collected in 2021 by Landesa and EconInsights (2,306 households)
- Additional data we collected on wives from these households in 2021 (1,785 wives)
- 21 focus group discussions (FGDs) with women and men in Amhara, Oromia and SNNP in 2021
- 2016 Demographic Health Survey (DHS) data on women's experience of IPV and land ownership

We analyzed the quantitative data in three ways:

- We conducted DID analysis to explore changes on 22 outcome variables between 2008 and 2021. This analysis largely replicates Cloudburst's impact evaluation and covers a longer period.
- We conducted CT analysis to examine the impact of the certificates on 26 outcome variables varies over time.
- We used the 2021 survey data and matched estimates from 2016 DHS to estimate the impact of land certification on women's risk of experiencing IPV.

We analyzed qualitative data as follows:

- We read English transcriptions of all interviews and FGDs.
- We coded the transcripts using the indicators in the hypotheses (described in Table 2.1 below) and additional codes assigned for emerging ideas.
- We grouped codes by variables of interest (region, gender, age groups) to find differences and similarities in the relations between land certification and the indicators.
- We identified quotations that explained or illustrated both qualitative and quantitative findings.

Following the baseline and endline design, we aggregated the outcomes into the following categories:

- Credit access
- Land disputes

[5] In the 2021 survey, households had held second-level certificates for, on average, 4 years. Our CT analysis modeled impacts up to 16 years for any certification and 14 years for second-level certification.

[6] IPV refers to threatened, attempted, or completed physical, sexual, or psychological harm by a current or former partner or spouse. This includes physical violence, sexual violence, threats of physical or sexual violence, and psychological or emotional violence (WHO 2014).

- Land rental
- Agricultural investment (Continuous treatment only)
- Soil and water conservation
- Perceived tenure security
- Women's empowerment and decision-making over land
- Intimate Partner Violence (IPV)

RESEARCH QUESTIONS, HYPOTHESES, AND INDICATORS

There are three important differences in the research questions between this evaluation and the Cloudburst evaluations[7]. First, the follow-on evaluation using 2021 data focuses on long-term effects of certification, while the 2016 Cloudburst study, conducted shortly after the programs ended, measures shorter-term impacts. Second, the 2016 Cloudburst study focused on differentiating the effects of the second-level certification versus first-level certification on households' and individuals' welfare. Our study revisits this comparison and examines the effects of second-level certification and any certification (regardless of level) over time. Third, the 2021 survey added questions to directly examine connections between land certification and IPV.

The research questions for this evaluation retain the emphasis on the welfare impacts of certification that directed the original impact evaluation design. Changes are described in the Limitations and Changes section.

Q1) What are the long-term effects of receiving land certification on well-being and economic outcomes for households? How do these differ by household characteristics such as gender of the household head, poverty status, or region?

Q2) How do the impacts of certification on the various outcomes unfold over time? Which (if any) impacts occur in the short-term, but are not sustained? Which (if any) impacts are not observed in the short term, but occur over longer periods of time?

Q3) What are the effects of receiving land certification on wives' land ownership and decision-making about land in D/MHHs in rural Ethiopia?

Q4) What are the effects of receiving land certification on the risk of women experiencing IPV in D/MHHs in rural Ethiopia? If so, why?

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[7] Research questions from the Cloudburst evaluation are:
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?

Q5) Are women who have certificates in their names better able to solve land-related conflicts? What are the main barriers preventing women from accessing justice when they experience a land conflict?

Table 2.1 summarizes the research hypotheses and corresponding outcome indicators.[8] For consistency and comparability, we retained the outcome indicators used by Cloudburst and added indicators on agricultural investment and IPV. A much as possible, we retained the questions and structure of Cloudburst's tools when designing the 2021 survey instruments for head of household and for wives of heads of households (Annex 3).

Table 2. 1 Hypothesis and Indicators

HYPOTHESIS-1: CERTIFICATION INCREASES WOMEN AND MEN'S USE OF CREDIT
Indicators: A. Total credit amount obtained in logged Birr using land certificate in past 24 months B. Total amount of credit obtained in logged Birr for farming purposes in past 24 months C. Total amount of credit households took for farming purposes in past 24 months D. Reported limitations/barriers faced by women (qualitative)
H-2: CERTIFICATION REDUCES THE NUMBER OF HOUSEHOLD-LEVEL LAND-RELATED DISPUTES AND DISPUTE RESOLUTION TIME
Indicators: A. Number of land-related disputes B. Average time taken to resolve disputes experienced by men and women
H-3: CERTIFICATION INCREASES THE LIKELIHOOD THAT MEN AND WOMEN ENGAGE IN LAND RENTAL AND SHARECROPPING ACTIVITIES
Indicator: A. Number of parcels rented out by households in prior 12 months B. Amount of land (ha) rented out by households in prior 12 months C. Probability household rented out any land in prior 12 months
H-4: CERTIFICATION INCREASES HOUSEHOLD INVESTMENT IN PRODUCTIVE ASSETS—SHORT- AND LONG-TERM
Indicators: A. Household average number of trees planted per ha B. Household average number of perennial plants planted per ha in prior 24 months C. Household average use of improved farm inputs per ha
H-5: CERTIFICATION RESULTS IN HOUSEHOLDS MORE LIKELY TO INVEST IN SOIL AND WATER CONSERVATION
Indicators: A. Probability a household makes any investment in conservation measures such as bunds, hedges, ditches, channels, or other water retention structures
H-6: CERTIFICATION RESULTS IN STRONGER PERCEIVED TENURE SECURITY FOR WOMEN AND MEN
Indicators: A. Women and men with the belief that they have rights to bequeath land under their possession B. Women and men with the belief that land redistribution within the *kebele* is unlikely over the next 5 years
H-7: CERTIFICATION INCREASES WIVES' INVOLVEMENT IN LAND MANAGEMENT AND LAND-RELATED DECISIONS
Indicators: A. Hectares of land the wife possesses jointly and solely and hectares she possesses solely B. Number of parcels the wife possesses jointly and solely and number she possesses solely C. Whether the wife possesses land in her name D. Whether the wife has a certificate for land she possesses E. Whether wives can decide to rent out their land F. Whether wives can decide what crops to grow on their land
H-8: CERTIFICATION DECREASES WOMEN'S RISK OF EXPERIENCING IPV
Indicators: A. Number of households in which: • Women have experienced IPV in households with land certificates, compared to matched data from DHS to create a comparison control group. • Respondents believe that increasing the number of women who have land will create conflicts between husband and wife • Respondents believe that women with land certificates in their names are more likely to experience IPV

Note: Some indicators included in the original Table in the PA were dropped. Changes are explained in the *Study Limitations* section.

[8] We discuss the changes in the hypotheses and indicators in the sub-section called *Study Limitations*.

In this impact evaluation, we approach IPV using a socio-ecological perspective (Garcia-Moreno et al. 2005; Ellsberg et al. 2015; Heise et al. 2019). Although ELTAP and ELAP did not include specific interventions on violence prevention, we hypothesize that having greater land tenure security from second-level certification may improve partnered women's position in their households and support women's decision-making power and their ability to negotiate with their partners and households in case they experience violence. This expectation is consistent with the idea that increasing women's assets increases their bargaining power within their household, therefore lowering women's risk of experiencing IPV. Additionally, we hypothesize that women with secure land tenure may be more able to leave abusive situations. Some implementers of land certification programs have also raised concerns about potential backlash against women who may be more likely to experience violence after receiving certificates. Identifying if land certification increases the risk of women experiencing violence may inform programming on land certification and can certainly lead to deeper conversations about how to mitigate such risks.

STUDY LIMITATIONS AND CHANGES TO PLANNED ANALYSIS

LIMITATIONS ARISING FROM SAMPLING

Several factors related to the sampling and data structures in the different rounds limit our ability to analyze all outcomes in the analysis plan over the full 2008 to 2021 period at the individual, parcel, and household levels for all participants in the original 2008 baseline.

Between 2020 and 2021, Ethiopia experienced COVID-19 and political conflict. Safety mitigation measures, including not collecting data in Tigray and part of Amhara, explained in detail in Section V, reduced the sample sizes. We do not conduct regional comparisons using quantitative data. Note that the study design at baseline and endline did not aim to have regional representativeness. Potential impacts of COVID-19 and conflict may have further reduced access to agricultural inputs and markets and increased IPV.

The 2008 baseline survey did not collect parcel-level data for several outcomes, including agricultural inputs, investment, production, and market activity. This limits our ability to rigorously assess certain field-based measures using the 2008 data. The 2015 endline survey changed to collecting parcel-level data collection for key data about the plots and crops and adding a set of questions to improve the determination the household's level of exposure to treatment activities at the time of baseline. For this study, when 2008 baseline data was not collected in a sufficiently comparable manner with the 2015 endline data, we use endline and follow-on data and note doing so in the discussion of results

The study design at baseline and endline did not create a roster of spouses. As a result, we cannot follow wives as individuals across the survey rounds and measure changes in their land ownership or decision-making or consistently note when a woman enters or leaves the household as wife. It is only possible to know that the women who answered the wives' surveys are associated with the male head of household at the time of the survey.

The implementation of certification efforts and delivery over time and beyond the 2015 endline means that whether a household is categorized in the treatment group in the DID analysis changes over time. Regardless of whether households were classified in the treatment or comparison groups at baseline in 2008, by endline in 2015 some households received first-level certification, some households were surveyed as part of the process of second-level certification without receiving the actual certificate, some households received second-level certification, and some did not receive any certification. By follow-on in 2021, more households were surveyed or received second-level certificates, changing their treatment classification. To mitigate this problem, we used the criteria in the Cloudburst endline evaluation to create four comparison groups and conducted post-data collection power calculations to identify the comparison group that had enough power to merit the DID analysis reported in the results section in this report.

CHANGES TO PLANNED HYPOTHESES AND OUTCOME INDICATORS

Across outcome families, several indicators originally planned for analysis had too few observations or insufficient variation to merit analysis. These included mean severity of disputes experienced by men and women; whether / proportion of households renting land out to non-relatives or friends; amount of land that households rent out to non-relatives or friends; monetary payment received in Birr/ha for land rented out in last 12 months; and monetary payment in Birr/ha for the largest parcel of land rented out.

Women's Empowerment

This study does not answer the research question from the pre-analysis plan of "Are women with their names in the land certificates more likely to make general decisions pertaining to their individual, household, and community well-being than those without certificates?" or the hypothesis from the pre-analysis plan that "joint land certification increases women's involvement in household management and decision-making." Analysis of these questions merits more attention than the scope of this evaluation and needs to differentiate women by headship status, marital status and type of marriage, age, and several other observed and unobserved intersectional factors. Qualitative data collection that could have supported this analysis had to be re-designed after the pre-analysis plan was approved given the political conflict in the study areas to prioritize general questions about the effect of land certification overall, instead of more detailed attention to potential differences on processes used in each locality that may have directly influenced women's empowerment. For example, whether having women in local committees affected women's empowerment.

Our analysis did not deeply examine the processes of second-level land certification or attempt to differentiate the effects of different components of second-level land-certification programs. As a result, it does not answer the research question from the pre-analysis plan of, "What aspects of the land certification process have enhanced or limited women's ability to get land certificates in their name and/or their participation in decisions related to land management?" Research question Q3 includes decisions around land management.

Because parcel-level data for women's decision-making was not collected to enable estimation of acreage of land under wives' certification and decision-making, as originally proposed in the pre-analysis plan, we focused on whether wives had certification and could make land management decisions.

We study the effects of any certification and of second-level certification on women's risk of experiencing IPV. However, given that the samples of women who experienced IPV were small, we could not have a representative sample to apply another layer to the analysis to answer whether joint certification or individual certification decreases women's risk of experiencing IPV.

Tenure security

About tenure security outcomes, we prioritized direct measures of respondents' tenure security over indicators of respondents' belief that the land certificate program would have a positive impact on tenure security, land investment, land rental, security of entering business transactions, and fallowing. We do not include the hypothesis from the pre-analysis plan of "Women and men with the belief that land currently under their possession will remain under their control over the next 5 years" because the 2021 survey did not include this question, which was considered too sensitive to ask amidst ongoing conflict.

Agricultural investment and soil and water conservation

Average investment in agricultural inputs/yield was dropped from the pre-analysis plan. The indicator would have needed to be measured in monetary values of inputs, which the surveys do not collect, to aggregate across crops and parcels. We prioritized the analysis of the indicator for practicing any soil or water conservation rather than measuring the average length of hedges, bunds, and ditches constructed, the average length of soil bunds stabilized with vegetation, and the average number of water retention structures constructed – all of which would need to account for parcel area or total household land area, topography, and prior investment.

Agricultural productivity

This evaluation does not directly empirically test the hypothesis that certification increases agricultural productivity as measured by crop yields because the survey data was not structured to estimate yields. Estimated proxy yields using the survey data, described below, were not of sufficient quality to responsibly measure certification's impact on crop yields. The recommendations section speaks to the data and methods needed to estimate crop yields and certification's effect on yields to test the long-standing and critical questions of whether, through what pathways, and over what time period certification affects agricultural productivity.

We had planned to test the hypothesis that certification increases agricultural productivity by comparing yields in kg/ha across several categories of crops using the 2015 and 2021 surveys, which collected crop production data using the same method using parcel-level data (the 2008 survey asked about household-level crop production). However, it was not possible to estimate crop yields because surveys did not capture area planted to each crop. Households were asked about areas to annual crops, perennial crops, garden crops, tree crops, pasture, and fallow; they were asked about individual crop production across crops (not at parcel level). One approach to estimate a "proxy yield" is aggregating crops into categories such as cereals, pulses, cash crops, etc. and dividing by area planted, measured as the area owned plus the area rented in by each household minus the area rented out, the area left fallow, and the area used for pasture. This resulted in many negative estimates of the area cultivated, highly variable and

unrealistically high estimates of yields (likely a result of inherent variability in yields and aggregation across multiple crops), and unrealistic estimated effects of certification. A second approach – estimating crop-level proxies by dividing each crop's total production by the total area planted to annual, perennial, or garden crops – resulted in proxy yields for individual crops that were 16 to 29 percent of yields estimated for Ethiopia by the United States Department of Agriculture for the same year (USDA 2021; USDA 2022). The second approach is likely to produce biased estimates because (1) the accuracy of the proxy yields decreases with the number of crops planted and so systematically underestimates yields for households that produce more than one crop, and (2) because households planting large areas of some crops and small areas of other crops will appear to have higher yields for crops planted on large areas and lower yields for crops planted on small areas than households that plant similar areas for each crop, even if the true yields are identical (this is also a potential source of bias in the first approach linked to the diversity of crop categories households cultivate). In both proxy yield approaches, the error in yields may be correlated with certification.

Estimating yields for categories of annual, perennial, or garden crops would better address the mismatch in units but is less useful from a policy perspective given the variation in value, use for home consumption or sale, and crop uses included within a category (ex. teff and beans as annuals, coffee and enset as perennials). Moreover, the surveys do not ask how respondents classify different crops. Given that such classification is likely to depend on the scale of production (ex. beans could be classified as garden or annual crops), and farmers tend to overestimate production on small plots relative to large plots,[9] these proxy measures are also likely to be biased. Evaluation results do shed light on the pathways of perceived tenure security, agricultural inputs and investments, credit, and women's empowerment. Qualitative findings align with the hypothesis that certification increases yields and highlight the importance of agricultural inputs but do not directly establish that pathway. Both men and women participants in FGDs in all regions reported that land certification increased their yields and that they are becoming more productive. Participants state that farmers who increased their yields were able to obtain additional agricultural inputs the following year, which motivated them to do better. Older individuals also expressed that their yields increased after certification, but some mentioned other challenges such as natural disasters were limiting their productive potential.

[9] For example, see Abay et al. 2019, Desiere and Jolliffe 2018, Gourlay et al. 2019, and Lobell et al. 2020.

III. CONTEXT AND RATIONALE FOR THE EVALUATION

With 115 million people, Ethiopia is the second-most populous nation in Africa and the fastest-growing economy in the region. However, it is also one of the poorest, with a per capita gross national income of $890 (World Bank 2022a; World Bank 2020a). Between 2010 and 2019, Ethiopia's real gross domestic product (GDP) grew 10 percentage points annually on average (IMF 2021). This growth slowed in Fiscal Year 2019/2020, first due to COVID-19, and later due to the political instability in Ethiopia.

Although Ethiopia's population growth rate is slowing, it is expected to continue through 2050, especially in rural areas with higher fertility rates, making food security a key concern (CIA 2021; OECD and PSI 2020). The welfare gap between rural and urban areas is expanding, making rural agricultural livelihoods improvement an increasing priority (OECD and PSI 2020). Although Ethiopia is urbanizing, analysts predict it will remain predominantly rural until 2050, and the rural non-farm economy is still in an early development stage (ITA 2021; OECD 2020).

Despite these demographic changes, agriculture employs an estimated 70 percent of the population and will continue to account for a large share of employment and economic growth (OECD and PSI 2020; ITA 2021). The GoE recognizes the economic importance of agriculture, and with the support of international donors and lenders, has made significant efforts to increase and commercialize agricultural production over the last two decades. The GoE established the Agricultural Transformation Agency (ATA) in 2010 to address systemic bottlenecks by supporting the Ministry of Agriculture (MOA) and other public, private, and non-governmental implementing partners. In 2015, the GoE launched the $660 million Second Agricultural Growth Project aimed at increasing the productivity and commercialization of small holder farmers (ITA 2021; World Bank 2022b). Although agricultural output grew 7.6 percent from 2004-2014, yields are still below regional averages, stymied by poor land management, small-scale landholdings, and limited investments in technology or productivity-enhancing inputs such as fertilizer and irrigation (Bachewe et al. 2018; ITA 2021; USAID 2019).

COVID-19 created new challenges for the agriculture sector and smallholder farmers, including labor scarcity, and disrupted access to input distribution, markets, and extension and cooperative services (Minten et al. 2020; Worku and Ulku 2021). However, studies on the effects of COVID-19 in Ethiopia found that rural households have limited their off-farm activities as a response to COVID-19, suggesting that agricultural livelihoods may have served as a coping strategy to support resilience and maintain food security (Asegie et al. 2021).

WHY LAND TENURE SECURITY MATTERS IN ETHIOPIA

Land tenure is "the relationship that individuals and groups hold with respect to land and land-based resources, such as trees, minerals, pastures, and water" (USAID LandLinks, n.d.). This relationship is determined by a "bundle of rights in land" that can include the rights to "occupy, enjoy and use; to cultivate and use productively; to sell, gift or bequeath; to mortgage or rent; or to transfer" (UN Women and OHCHR 2020). Land tenure systems vary across societies, from formal to informal, and determine who can use the land and its productive resources, for what length of time and under what conditions (UN Women and OHCHR 2020; USAID LandLinks n.d.).

Secure land tenure is necessary, but may not be sufficient, for rural Ethiopians to make investments and transactions that advance their livelihoods and address long-term pressures on land availability and productivity. Agriculture employs over 80 percent of Ethiopia's labor force (Adamie 2021; Ethiopian Economics Association 2016), and 80 percent of Ethiopia's population lives in rural areas (USAID 2022; World Bank 2020c). Smallholders' efficient and sustainable land use and management is essential for sustainable agricultural-led growth and for national social welfare.

Farmers with secure use rights over their land for several years are more able to make medium-term investments (*e.g.,* fallowing) and long-term investments (*e.g.,* terracing) because the land is in their control. They also have more incentive to make the investments because they expect their continued rights to the land and its produce to yield ongoing future benefits beyond recouping investment costs. Secure land tenure provides a predictable base upon which farmers and households can plan their agricultural production and other livelihood activities over time.

Although existing research often focuses on links between land formalization (rather than tenure security) and investments in agricultural land, there is strong evidence in Ethiopia that land certification and knowledge of land rights promotes smallholders' agricultural investments (Deininger et al. 2008; Holden 2009; Melesse et al. 2018; Ghebru et al. 2013; Quisumbing and Kumar 2014), perhaps most consistently in soil conservation. Gebremedhin and Swinton's (2003) found that Ethiopian farmers who had long-term secure tenure were more likely to make costly but durable long–term conservation investments (*e.g.,* terracing), while farmers who had only short–term land tenure security were more likely to make less expensive and less durable investments (*e.g.,* soil bunds). Holden, Deininger, and Ghebru (Deininger et al., 2011; Holden et al., 2011) find significant positive effects of certification on the land rental market activity. Researchers also find that land certification in Ethiopia increased women's participation in land market activity and even improved child nutrition (Ghebru & Holden, 2013).

With increasing pressures on land's availability and productivity from degradation, climate change, and shifts towards commercial cultivation, farmers' tenure security and their investment choices will be crucial to sustain, let alone raise, productivity and improve food security. Land suitable for cultivation is increasingly scarce, and little remains available for expansion (ITA 2021). Eighty percent of Ethiopia's land surface is prone to moderate or severe soil degradation (World Bank 2020b), and more climatic and environmental challenges such as recent erratic precipitation (FAO 2021) are expected. Current rates of soil conservation and irrigation are low. According to the 2018-2019 Ethiopia Socioeconomic Survey Report (EPHI and ICF 2021), 22 percent of farm households in Tigray, 30 percent in Amhara, 45 percent Oromia, and 59 percent SNNP had not adopted any soil conservation practices. Investments in irrigation were rare, with 5 percent or fewer households in each of the four regions with any irrigated fields.

Tenure insecurity is also a source of conflict that affects the safety and livelihoods of individuals and communities. For example, in southern Ethiopia, insecure property rights and tension over land use has led to conflict over land and water resources among and within pastoral groups and decreased the sustainability of land use (Beyene 2017). More secure tenure and clear, enforceable property rights can reduce land-related disputes and conflict within and between farmers, pastoralists, and commercial

interests. As land for cultivation becomes increasingly scarce, preventing rural land-related disputes by clarifying and enforcing boundaries will be increasingly important. It will also be necessary to increase households' and communities' abilities to use agricultural and pasture lands sustainably, productively, and predictably. In Ethiopia, several studies found that land registration and certification reduced the number of border and inheritance disputes (Giri 2010; Holden and Neumann 2021; Holden and Tefera 2008; Holden et al. 2011).

Insufficient availability and productivity of land may also be among the drivers of migration in Ethiopia (Bundervoet 2018, Kosec et al. 2018). Although limited, the data suggests that 50 to 70 percent of the population moves internally, either briefly or permanently (Endris and Kassegn 2021). However, the rural-to-urban share of migration increased from 24 percent in 2005 to 33 percent over 2008-2013, primarily driven by people leaving rural areas to seek employment (OECD and PSI 2020).

WHY LAND TENURE SECURITY MATTERS TO WOMEN IN ETHIOPIA

Two-thirds of Ethiopian women live in rural areas, and 80 percent of those women live in the study areas of Oromia, Amhara, and SNNP (EPHI and ICF 2021). Having secure land tenure means that rural women can earn income from the land by farming, renting out land, or other means, and that there is stability and security to allow women to invest in their farms, wealth, households, and communities.

Women's land tenure affects not only their own livelihoods and security but overall agricultural productivity. Women provide approximately 29 percent of the labor for Ethiopia's crop production (Palacios-Lopez et al. 2017). Drawing on data from the 2011–2012 Ethiopian Rural Socioeconomic Survey, Aguilar et al. (2015) find a 23 percent gender gap in agricultural productivity, in favor of men. Their estimates suggest up to 10 percentage points of the gap could be closed if women had returns to land certification, land extension, extension services, and product diversification. This aligns with evidence from other countries where women's smaller cultivated land areas and more limited access to agricultural inputs, extension services, and credit are drivers of the gendered productivity gap (World Bank 2019a 2019b).

Kumar and Quisumbing (2015) show that community-based land registration, which promoted joint certification among spouses, and reforms to the Family Code implemented in 2000, which provide for community of property that acquired after marriage or common law unions, created conditions for self-reinforcing reforms that favor gender equity[10].

Traditional customary systems, social norms, low awareness of women's land rights, and government institutions not consistently observing the law are underlying barriers to Ethiopian women freely and fully exercising their legal land rights, even in regions of Ethiopia where the statutory framework supports women's land rights (Ahmed 2017; Girma and Giovarelli 2013). Beyond land access, these constraints limit women's decision-making over and ability to benefit from land. For example, to leverage land for collateral, a woman usually must ask her husband or relatives to sign for her and

[10] The LandLinks country profile for Ethiopia contains more detailed information: https://land-links.org/country-profile/ethiopia/#1528464170981-760bbcdc-3e0e. Last Accessed on October 8, 2021.

typically will have less control over the loan (Bhalla et al. 2021), limiting her ability to leverage certified land for collateral. Slavchevska et al. (2021) find that among agricultural parcels owned solely by women, 53 percent were not managed solely by women, and women did not solely control the economic returns for 40 percent of the parcels. Representation of women in rural institutions, including land governance, is low, and women are rarely in leadership roles (Bhalla et al. 2021). It is not common for women to speak in public meetings and women are not considered decision-makers (Cohen and Lemma 2011). Findings from the Women's Empowerment in Agriculture Index corroborate that low group membership and confidence speaking in public are among the top contributors to women's disempowerment in much of rural Ethiopia (Feed the Future 2018; Hirvonen et al. 2016). These limitations affect women's individual rights, their social identity and status in the community as well as their returns from livelihood activities (Lavers 2015).

Women's marital status affects their statutory land rights and the security of those rights. Ninety-eight percent of Ethiopian women aged 45-49 have been in a union in their lifetime (EPHI and ICF 2021). Between 16 percent and 14 percent of married women in Oromia and the SNNP are in polygynous unions (CSA and ICF 2016). Polygyny creates additional ambiguity for women's land tenure because Ethiopian criminal and family code prohibit it, leaving spouses' (mainly women's) marital property rights without legal recognition. Because polygyny is technically illegal, federal, and regional land proclamations did not specify rules for registration of polygynous families' land; some regions include all the wives in one certificate, while others register wives separately. Registration is often led by the husband who may favor to register one wife over others have registration.

Insecure tenure may leave women more vulnerable to IPV, which is widely prevalent in Ethiopia. The Ethiopia 2016 Demographic and Health Survey[11] found that 35 percent of ever-married women in the age group 15-49 reported experiencing some form of physical, sexual, or emotional violence by current or former partners. A 2018 systematic review found that IPV in Ethiopia was even higher among women who were divorced, separated, or widowed than among married women, with prevalence rates from most studies in the range of 60 percent or higher (Cordon et al. 2018). Regionally, IPV prevalence was higher in Oromia within the Highlands region (Cordon et al. 2018) as well as in Western Amhara, Gambella, Central Tigray, and Harari Regions (Muluneh et al. 2021). Actual prevalence of IPV may be even higher because respondents may not be fully aware of what IPV encompasses (Zegenhagen et al. 2019) or may be reluctant to report it (Gibson et al. 2020).

Boudreaux's (2018) review of the limited but growing literature on the relationship between land tenure and IPV finds mixed evidence for the effects of women's land rights on women's likelihood of experiencing IPV, with both positive and negative associations or effects on emotional IPV but not sexual or physical IPV. A common rationale behind a positive association is that land ownership and control of returns may increase women's bargaining power within the relationship or provide a residence outside the partnership. The rationale behind a negative association is social backlash when women exercising their land rights are seen as transgressing social norms.

[11] See page 290 in Central Statistical Agency/CSA/Ethiopia and ICF. 2016. Ethiopia Demographic and Health Survey 2016. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: CSA and ICF.

WHAT WE KNOW ABOUT WOMEN'S LAND TENURE IN ETHIOPIA

Evidence on Ethiopian women's land tenure is limited and mainly focused on female heads of households. Nationally, 25 percent of women report insecure tenure[12], compared with 28 percent for men, and only approximately 65 percent of women have formal documentation of land rights, compared with approximately 80 percent of men (Prindex 2020). Nineteen percent of rural women reported tenure insecurity, and the most frequent reasons rural women gave for tenure insecurity were lack of money or other resources and being asked to leave by the owner or renter (Authors' calculation using Prindex Ethiopia 2020 data).

Most existing data on women's land tenure compares FHHs with D/MHHs. Although this data does not represent women who are not household heads and speaks less to women's and men's individual tenure experiences, it is still valuable given that approximately 25 percent of Ethiopian households are female-headed (EPHI and ICF 2021). Nationally, FHHs are almost as likely as D/MHHs to report owning[13] the land they farm – 90 percent vs. 95 percent (EPHI and ICF 2021). However, FHHs on average own less area for farming – 0.4 ha compared with D/MHHs' 1.12 ha (CSA 2019). Forty-eight percent of rural women own land, and of those, 49 percent report having a title or deed; among rural men, 56 percent own land, and of those, 51 percent report having a title or deed (CSA and ICF 2016).

Within the study area, evidence suggests that long-term tenure security for FHHs coexists with remaining gendered inequalities in certification. Ninety-seven percent of female household heads reported believing they have a right to bequeath land, and only 17 percent reported concern about land redistribution (Cloudburst 2016). These responses suggest female heads' long-term perceived tenure security is high. Despite second-level certification programs' efforts to register land to multiple persons and promote joint registration, the Cloudburst IE found that only 50 percent of wives in D/MHH had a land certificate in their name, as compared to 80 percent of the male heads (2016). A 2019 evaluation of LIFT, which employed several approaches to ensure women's benefits/participation from second-level certification, found that 77 percent of certificates listed women as landholders, either jointly (55 percent) or individually (22 percent) (Mekonen et al. 2019)[14].

HISTORY OF LAND CERTIFICATION AND ADMINISTRATION IN TIGRAY, AMHARA, OROMIA, AND SNNP

In 1998, the GoE embarked on a rural land registration program to certify the long-term use rights of rural households in the four rural Highlands regions of Ethiopia. The program began in the Tigray Region, followed by Amhara (2002), and finally was implemented in the Oromia and the SNNP Regions (2004).

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[12] Prindex measures perceived tenure insecurity by how likely a survey respondent thinks it is that they will lose any of their land or real properties within five years.

[13] In Ethiopia, the government owns all land according to the Federal Constitution. Communities, families, and individuals have long-term use rights.

[14] The evaluation analyzed 7.1 million of 9 million LIFT-certified parcels DAI reported LIFT has issued (Smith et al. 2019). The evaluation also found that by area, 62 percent of the LIFT-certified land was under joint holding, while 21 percent was individually held by females and 16 percent was held individually by males; it found that there was no statistically significant difference in mean parcel size by gender of the holder. DAI reported that nearly 90 percent of the nine million land certificates that LIFT has issued include women as joint landholders (Smith et al. 2019).

The certification effort was at least partially motivated by an intention to increase tenure security after a history of land reallocations. Nationalization of all rural land followed the change of government in Ethiopia in 1974, and land reallocations occurred for nearly four decades afterwards. While land reallocations were intended to make land access more egalitarian, they also created tenure insecurity by taking land away from some groups of people to allocate to others (Adamassie 2000). This reform disrupted social and institutional arrangements through which people accessed land and produced crops, including landlord-tenant relations in the south and communal production in other parts of Ethiopia (Admassie 2000; Holden et al. 2011), and mandated the creation of peasant associations that created a hierarchical organization from grassroots to higher levels of government. As recently as 2015, in Amhara, Oromia, SNNP, and Tigray, at least 15 percent of household heads believed reallocation could still take place in their *kebele* (Cloudburst 2016).

The certification programs were grounded in Ethiopia's 1995 Constitution, which mandated equal property rights for women and men and reinforced the regional government authority to "administer land and other natural resources in accordance with Federal laws," (Federal Republic of Ethiopia 1995) and the 1997 Federal Rural Land Administration Proclamation which declared rural land as common property of the "Nations, Nationalities and Peoples" of Ethiopia (FAO n.d.-a) and set out principles for Regional Councils and other regional and local governments to administer rural lands and undertake certification.

The 2005 Federal Democratic Republic of Ethiopia Rural Land Administration and Land Use Proclamation (No. 456/2005) replaced the 1997 Land Proclamation. This new proclamation presents a new system of administration for rural land management and use, as well as for sustainable rural land use planning based on the different agro-ecological zones. It provides rules for acquisition and use of rural land by peasant farmers and pastoralists. It also governs the transfer, distribution, and use of rural land, as well as how to solve disputes, and defines responsibilities of the Federal Ministry of Agriculture and Rural Development and Regions (Federal Negarit Gazeta 2005). However, Haddis and Bekure (2017) suggest the Proclamation does not provide sufficient guidance on how to implement comprehensive and integrated land use planning, and how to regulate ongoing land use. Currently, the GoE is revising the Land Proclamation.

PROGRAM DESCRIPTIONS

The GoE began implementing second-level certification in Tigray, Amhara, Oromia, and SNNP[15] Regions in 2005. The GoE conducted second-level land certification in conjunction with ELAP/ELTAP, LIFT, and other donor programs in four steps:[16]

1) Public Awareness: Communities are informed about the land registration process, requirements, rights, and obligations. Local authorities inform farmers about events, required steps, and documentation.

[15] Implementation occurred in parts of the SNNP that now belong to the Sidama Region created in 2020.
[16] Source: Buckle and Woodhouse (DAI) 2021.

2) Adjudication and Demarcation: Field teams visit land sites to document individual plots' occupancy and boundaries. This may involve participants demonstrating their parcel boundary in the presence of neighbors and local leaders. Using aerial photography, para-surveyors record parcel boundaries on maps.

3) Public Display: The plot information is digitized, printed, and taken to a local center where community members can view it and confirm or challenge the information.

4) Certification: Once participants' plot data is verified, it is recorded in a local government register of land rights. Landholders then receive a printed certificate which includes details about their parcel boundaries, occupancy, and land rights.

Although programs followed the same legally required steps for second-level certification, some programs linked certification with different complementary services such as access to finance. ELTAP, ELAP, LIFT, and other second-level certification efforts also included activities to educate communities, land administration, and land governance institutions on women's land rights, as well as engage women in the second-level certification process and promote joint certification.

From 2005 to the present day, several external funders supported the second-level certification programs. Main programs[17] in the study regions are:

1) THE ETHIOPIA LAND TENURE ADMINISTRATION PROGRAM (ELTAP)

In 2005, implementation of the ELTAP activity began. The main objective of ELTAP was to assist the GoE to implement a land certification system that provided rural landholders use rights with robust and enforceable tenure security in land and related natural resources in Tigray, Amhara, Oromia, and SNNP (USAID 2008).

ELTAP worked with Ethiopian district land administration agencies to introduce second-level certification, which consisted of a computerized land information system with computerized digital mapping of parcels, cadastral registration, and the issuance of land certificates. Under ELTAP, second-level cadastral surveying and registration of rural land started in Amhara and Oromia during the first quarter of 2007, followed by Tigray and SNNP in the second quarter.

Through the end of the program in May 2008, a total of 147,449 households were visited in 24 *woredas* (six *woredas* in each of the four regions), and the boundaries of 704,754 parcels were mapped using GPS devices and registered with the land administration office. However, ELTAP encountered delays in issuing certificates, resulting in only 56 percent[18] of the parcels mapped under ELTAP receiving their second-level certificates in 2008.

[17] Other donor-funded second-level land certification programs that followed ELTAP and ELAP include the Responsible and Innovative Land Administration (REILA) program, supported by Finland and the Sustainable Land Management Program II of the World Bank.
[18] This number is recorded in Monchuk et al. (2014) USAID/Ethiopia Land Tenure Administration Program (ELTAP) and Ethiopia Land Administration Program (ELAP): Impact Evaluation Design. In: https://pdf.usaid.gov/pdf_docs/PA00T682.pdf

2) THE ETHIOPIA LAND ADMINISTRATION PROGRAM (ELAP)

USAID's partnership with the GoE continued from 2008-2013 through ELAP, which aimed to strengthen rural land tenure security and land administration through similar programming as ELTAP, including continued implementation of second-level certification. However, under ELAP new certification efforts focused on areas with high agricultural production and investment potential. ELAP also facilitated completion of the certification process for many households that began certification under ELTAP but had not yet received certificates when ELTAP ended in 2008. Nearly one-third of the parcels that ELAP certified were for households that were originally selected for the ELTAP program (USAID 2008, USAID 2013). Overall, ELAP reached 63 percent of its target, certifying 192,184 parcels from 89,178 households (USAID 2013).

3) THE LAND INVESTMENT FOR TRANSFORMATION (LIFT) PROGRAM

The LIFT program, funded by UK Aid and implemented from 2014-2021, significantly scaled-up second-level certification in Tigray, Amhara, Oromia and SSNP. Like ELAP and ELTAP, LIFT included land mapping, registration, and second-level certification. However, instead of the certificates being issued at the household-level, certificates under LIFT were issued to each individual landholder in the household, including female spouses, reflecting the program's emphasis women's land rights. To increase women's participation and benefit, LIFT also employed Social Development Officers in each *woreda* to identify and formulate a plan to address women's land issues and identify possible violations of women's land rights. They also organized public awareness activities to sensitize women, men, *kebele* leaders, and institutions on women's land rights and ways to engage women in certification processes; held women-only meetings and meetings at the sub-*kebele* level; and planned options for how to certify land in polygynous households (Mekonen et al. 2019). Alongside second-level certification, LIFT introduced complementary interventions to promote landholders use of credit, land rental, and agricultural inputs markets to improve the investment, productivity, and income outcomes for certificate holders. Complementary interventions included training and working with land rental service providers to use a template for formalized land rental transactions and work with Ethiopian microfinance institutions to create a loan product that leverages land certificates and crop production. As of July 2021, over 14.3 million second-level land certificates (SLLCs) have been issued, in 175 of the 242[19] *woredas* (districts) across the four Highland regions, benefitting over five million households (Holden and Neumann 2021).

[19] Total woreda figures compiled from Ethiopia's Central Statistical Agency website, https://www.statsethiopia.gov.et/.

IV. EXISTING EVIDENCE ABOUT LAND CERTIFICATION

This section briefly summarizes the existing empirical evidence for the hypotheses in Section II about the relationships between land certification and access to credit, land disputes, rental activity, agricultural investment, perceived tenure security, women's land rights, and intimate partner violence.

Despite the recent emergence of high-quality systematic reviews and a multitude of program-specific research and evaluations, the rigorous evidence base on land tenure remains thin. There is a lack of longitudinal studies on long-term impacts, especially in Sub-Saharan Africa where only Rwanda and Ethiopia have completed large-scale land regularization programs. Few studies investigate more than one step in the pathway from land certification to agricultural productivity or the timing of when those steps occur. Much of the literature assumes that formalization increases tenure security (Stickler et al. 2018) without exploring whether, at what point in time, or in what circumstances the certification increased beneficiaries' perceived tenure security. Finally, despite recent efforts to include multiple spouses in evaluations, studies still too often measure certification and outcomes at the household level, obscuring gendered and other differences in who does and does not benefit from land certification. This impact evaluation seeks to fill several of these gaps.

LAND CERTIFICATION AND CREDIT (HYPOTHESIS 1)

Land formalization is expected to make it easier for landholders to access credit by using their land as collateral and/or proof of occupation and livelihood, enabling them increase investment in agricultural productivity. However, recent reviews of the evidence and impact evaluations do not show a clear link between titling and access to formal credit in low and middle-income countries (LMICs) (Holden and Ghebru 2016; Higgins et al. 2018; Lawry et al. 2017; MCC 2022)[20]. Literature suggests that strong financial and regulatory institutions must also be present for individuals to be able to use their land as collateral to obtain loans, which is often lacking in LMICs. Sanjak (2012) suggests that the expectation that land formalization will increase farmers' access to credit fails to consider other significant factors including the farmers' income levels, the availability of credit in the market and the viability of the borrowers plans for repayment and of their business plans.[21] Meinzen-Dick et al. (2019) found little evidence regarding the associations between women's land rights and credit. Recent exploratory research is investigating formal and customary land documentation potentially improving access to informal credit or microfinance by conveying information about the certificate holder and their creditworthiness to lenders (Cloudburst 2016; USAID 2021).

Although in Ethiopia land cannot be used as collateral, second-level certificates may facilitate credit access by indicating that the loan will be used for agricultural purposes, validating livelihood and creditworthiness, especially through alternative financing such as community-based lending and microfinancing (Cloudburst 2016). The 2016 impact evaluation of ELTAP/ELAP second-level certification relative to first-level certification found a ten percent increase in the likelihood of taking out credit for farming, and a small increase in the amount of credit obtained. The Foreign, Commonwealth & Development Office's (FCDO's) second-level certificate-linked intervention created

[20] Evaluation Brief: Land Governance Reform for Equity and Growth in Lesotho (mcc.gov)
[21] Land Titling and Credit Access – Understanding the Reality | LandLinks (land-links.org)

the first ever loan for rural landholders secured by the "produce of the land and/or the land use right." Although the loan program has not undergone an impact evaluation or counterfactual analysis, a 2021 survey found that *woredas* with the credit intervention had twice as many farmers that were aware second-level certificates can be used to access credit (21 percent compared to ten percent in non-intervention *woredas*); however, rates of gaining credit via a second-level certificate were less than four percent in intervention and comparison *woredas* (Holden and Neumann 2021).[22] For individuals who did obtain loans, only two percent have ever missed a payment, and their average land productivity increased by 33.6 percent (LIFT 2019). Surveys and interviews of beneficiaries[23] indicated that access to finance accelerated investment and productivity and led to higher incomes (LIFT 2020).

LAND CERTIFICATION AND LAND CONFLICTS (HYPOTHESIS 2)

Formalization programs could prevent conflicts, mitigate crises, and aid post-conflict recovery (Von Uexkull and Pettersson 2018) by clarifying boundaries and providing verifiable land rights, or fostering local dispute resolution institutions, promoting education and awareness around land rights, and by contributing to post-conflict stability (Beyene 2017; Blattman et al. 2012; Sonmez et al. 2018). Formal recognition of tenure can increase social capital and trust within a community (Hartman et al. 2018). Formalization may also lessen the risk of being forcibly displaced, provide stronger evidence for restitution processes, and reduce the need for smallholders to expend time and resources to defend their land claims, freeing resources for more productive agricultural activity and investment (Goldstein et al. 2018; Linkow, 2016). This can be particularly important for women and other vulnerable groups whose rights may not be sufficiently protected under traditional practices (Joireman 2008).

In Ethiopia, several studies found that land registration and certification reduced the number of border and inheritance disputes (Giri 2010; Holden and Tefera 2008; Holden et al. 2011). The 2021 qualitative evaluation of the LIFT second-level certification program also found evidence of reductions in disputes (Holden and Neumann 2021). However, the 2016 ELTAP/ELAP evaluation found no strong impact in reducing disputes with having a second-level land certificate relative to having a first-level land certificate (Cloudburst 2016), suggesting that the additional steps in the second-level certification process may not have been critical for dispute prevention.

LAND CERTIFICATION AND THE RENTAL MARKET (HYPOTHESIS 3)

Land formalization can facilitate land rental market transactions by assuring renters that their claim can be enforced and by assuring landholders that renters cannot usurp their land. When farmers can lease or sell land, land use would in theory be shifted towards users with the highest efficiency, thereby increasing productivity and enabling further investments. The literature indicates that formalization enables increased land transactions, but more so in Asia and Latin America than in Africa because conditions supporting well-functioning land markets are under-developed in Sub-Saharan Africa (Lawry et al. 2017). Global evidence on the effects of land formalization on rentals alone is mixed. For example, in Higgins et al.'s (2018) examination of four studies on the link between land titling programs

[22] Comparing data from the LIFT 2021 study to the LIFT EEU Impact Survey (Holden and Neumann 2021).
[23] The study drew on qualitative interviews to attributed causation. Surveys did not include a control group and compared responses from 2019 to 2020.

and land rentals, two of the four studies found a positive association, one found no effect, and one demonstrated mixed results (Higgins et al. 2018).

In Ethiopia, there are indications that certification increases land rentals.[24] Ghebru and Girmachew's (2020) quasi-experimental impact evaluation of second-level certification revealed a market stimulant effect: households' likelihood of renting out was five percent higher for those who received SLLCs as compared to those without a SLLC. They also found spillover benefits for non-beneficiary households' likelihood of renting-in land. Although the 2016 impact evaluation of ELTAP/ELAP did not find positive additional impacts of second-level certification on land rental activity beyond first-level certification, the *combination* of having second-level certification and the introduction of standard land rental contracts with a network of service providers to facilitate land rental transactions in LIFT may have encouraged people to enter the land rental market for the first time, decreased land rental disputes, and increased the amount of land under productive use (Holden and Neumann 2021). Surveys and interviews of beneficiaries of both the rental formalization and second-level certification through LIFT suggest that the complementary interventions enabled an expansion of the rental market and a more efficient allocation of land overall, drawing in new landlords and tenants and also expanding rented land areas and contract durations[25]. Without piloting these additional measures, certification might not have had the same impact because Ethiopian law restricts land market activity.

A striking positive outcome of formal land tenure for women has been the increase in land rented or sharecropped out by female heads of household and especially widows. (Deininger et al. 2011; Holden et al. 2011; Macours et al. 2010; Yami and Snyder 2016). Holden and Ghebru (2013) found evidence that increased rentals by these women enhances overall agricultural productivity because they rent out the plots to people that uses this land more efficiently. These new land users who rented land from poor female–headed households utilize land in a way that improves food production and food access on average.

LAND CERTIFICATION AND INVESTMENT IN AGRICULTURAL INPUTS, INVESTMENT IN TREES, PERENNIALS, RENTING IN, AND SOIL AND WATER AND SOIL CONSERVATION (HYPOTHESES 4, 5)

Empirical evidence generally supports the theory that formalization encourages agricultural investments by increasing the likelihood that farmers will have the land long enough to benefit from the investments. In recent systematic reviews, Higgins et al. (2018) and Lawry et al. (2017) examined studies from Latin America, Asia, and Africa and found that land titling programs consistently had positive effects on land-related investment. Some authors caution that land tenure security is only one of many components that may spark farmers' long-term investments, and that such investment can only take place in an environment with sufficient access to inputs, credit, markets, and complementary infrastructure (*e.g.,* transportation) (Lawry et al. (forthcoming); Lawry et al. 2017). Some scholars also warn against reverse causality: while tenure security can increase investments and production, the

[24] Because land sales are illegal in Ethiopia, renting out is the only avenue for land transfers.
[25] The surveys had no control and it only compared responses from 2019 to 2020; the study also drew on the SLLC 2021 qualitative interviews that attributed causation. More research is needed to understand how this combination of measures translated into the gains detected.

reverse can also be true. Investments and agricultural activities are sometimes undertaken to enhance tenure security. For example, in some regions in Ethiopia, land use rights have had historically had to be exercised to be valid (Ghebru and Holden 2016). Evidence from Ghana suggests that tree planting may be a means to secure a claim to land (Otsuka et al., 2003; Goldstein and Udry, 2008). Although there are insufficiently gendered data and research, there is evidence that in some contexts, women may increase land-related investments more than men in response to increased perception of tenure security from formalization (Meinzen-Dick et al. 2019).

Prior studies in Ethiopia have found that land registration and certification have had positive impacts on smallholders' land improvement practices, such as soil and water conservation structures (Ahmed 2017; Deininger et al. 2011; Melesse and Bulte 2015), tree-planting, and use of organic fertilizer (Melesse and Bulte 2015). How long after certification farmers will make these investments is less clear. In some contexts, investment effects were observed as soon as one year after certificates were issued: Holden et al. (2009) found farmers' likelihood of investing in soil and water conservation increased by 20 to 30 percentage points. Gebremedhin and Swinton (2003) found that farmers who had secure tenure were more likely to invest in costly but durable long-term conservation investments (e.g. terracing); farmers who had only short-term land tenure security were more likely to make less expensive and less durable investments (e.g soil bunds). However, using the 2009 round of the Ethiopian Rural Household Survey, Quisumbing and Kumar (2014) find that the disparity in men's and women's knowledge about land rights diminishes the adoption of soil conservation practices as well as the planting of tree crops and legumes.

Evidence of impacts specific to second-level certification on agricultural investment is less strong. The ELTAP/ELAP impact evaluation found that second-level certification was not associated with additional improved agricultural practices compared with first-level land certification (Cloudburst 2016). However, in their quantitative assessment of second-level certification, Ghebru and Girmachew (2020) find that likelihood of soil and water conservation investment and maintenance were 13 percent higher for those who received SLLCs as compared to those without a SLLC. A mixed-methods assessment of LIFT found that one-fifth of farmers made increased investments, including 15 percent of farmers who planted more trees or long-term crops investments because of second-level certification. Farmers were motivated by increasing and diversifying income and by reducing erosion, following a 2020 drought (Holden and Neumann 2021). The study indicated that weather and input-use played a larger role, but possession of SLLC's encouraged long-term defensive investments, nonetheless.

LAND CERTIFICATION AND TENURE SECURITY (HYPOTHESIS 6)

Land formalization programs such as ELTAP/ELAP and LIFT are undergirded by theoretical assumptions that land held without formalization is not sufficiently secure, and that formalization will provide landholders greater land tenure security. However, there is a debate about whether land without formal tenure is insecure. *De facto* or customary tenure can provide ample tenure security, although the security of customary tenure, and for whom it is secure, is highly dependent on context, including location, gender, and marital status (Stickler et al. 2018). Having a certificate does not necessarily fully secure tenure or cause a person to believe that their tenure is completely certain. Additionally,

contextual factors such as historical instances of state-sponsored land appropriation can affect perceptions of tenure security (Higgins 2018).

In Ethiopia, most studies have found a positive relationship between formalization and tenure security, including the impact evaluations of the land certifications programs (Ahmed 2017; Cloudburst 2016; de Brauw and Mueller 2012; Deininger et al. 2011; Holden et al. 2011; Kumar and Quisumbing 2015; Melesse and Bulte 2015; Yami and Snyder 2016).[26] The 2016 ELTAP/ELAP impact evaluation found that there were tenure security gains from second-level certification over first-level, albeit modest, including an 11 percentage point increase in whether the household head believes that they have a right to bequeath their land (Cloudburst 2016). A 2021 qualitative evaluation of the LIFT second-level certification program found improvements in perceived tenure security (Holden and Neumann 2021). Using ELTAP/ELAP and LIFT data for a quasi-experimental impact evaluation, Ghebru and Girmachew (2020) found that the second-level certification programs had no significant additional effect on overall household perceived tenure security. However, their gender-disaggregated analysis finds 1) positive significant effects of second-level certification for married women's tenure security against risks of family disputes and expropriation by government or investors and 2) female household heads' perceived security against risks of appropriation. Effects were negative for male household heads. The authors postulate that the practice of issuing joint land certificates to heads and spouses could explain the increase in security married women feel with SLLCs and the decrease in security among men.

The widespread interest among rural Ethiopian landholders in obtaining land certificates is widely attributed to a perceived pre-program tenure insecurity rooted in fears of the state expropriating land and the recent history of land redistribution under the Derg regime from the mid-1970s to 1991 and by various subsequent state governments (Deininger et al. 2011; Holden et al. 2011; Melesse and Bulte 2015; Yami and Snyder 2016).

LAND AND WOMEN'S DECISION-MAKING (HYPOTHESIS 7)

In their systematic review, Meinzen-Dick et al. (2019) found evidence that overall, women with rights to land have a stronger bargaining position within the household. Research across several Central American countries also shows that women with secure land rights are more likely to have control over household income and access to credit (Katz and Chamorro 2002). Early results from a randomized controlled trial in Tanzania similarly finds that certification led to a reduction in land use decision-making solely by the male head (Persha, L. et al. 2018). A quasi-experimental impact evaluation in China finds that women's access to income generated from land use can enhance their tenure security and had a significantly positive effect on women's empowerment (Han et al. 2019).

Specific to Ethiopia, a quasi-experimental impact evaluation of joint land certification found significant effects on women's empowerment, particularly on dimensions of empowerment associated with women's participation in roles outside the home (Melesse et al. 2018). The 2016 ELTAP/ELAP impact evaluation found dramatic increases in women's empowerment variables associated with second-level certification—an 11 percentage point increase in the likelihood of a wife possessing land in her name, a

[26] However, some scholars question how secure tenure is if one's rights are limited to use rights as they are in Ethiopia, including Ayano (2018) and Rahmato (2014).

one-third hectare increase in the amount of land wives held, and a 44 percentage point increase in the likelihood that a wife makes decisions about crops grown on her land. However, these findings were not consistent or robust across different treatment and comparison groups (Cloudburst 2016). Ghebru and Girmachew's recent (2020) impact evaluation found positive impacts of having SLLCs on FHHs' access to and control over land but negative effects for women living in households headed by men.

There is evidence that women's land tenure improves women's empowerment and the health and education of children (Meinzen-Dick et al. 2019; Higgins et al. 2018). However, these effects depend on contextual factors including differences in tenure regimes, marital practices, social and cultural norms, and additional local laws that regulate unions, marriage, and the transfer of assets (Meinzen-Dick et al. 2019; Boudreaux 2018; Deere and Doss 2006). Meinzen-Dick et al. (2019) also found that these impacts were almost always stronger in households where land was held solely by women, as opposed to jointly held which more common in Ethiopia.

INTIMATE PARTNER VIOLENCE (HYPOTHESIS 8)

Intimate partner violence (IPV) is one of the clearest indicators of women's disempowerment. Meinzen-Dick and colleagues (2019) summarize the existing empirical evidence on the relationship between women's land rights and women's risk of domestic violence. While there is a body of literature that finds statistically significant effects, the directions of those effects are mixed. For example, Peterman et al. (2017), using matching analysis based on 28 international Demographic and Health Surveys (DHS found that land ownership was negatively associated with IPV in five countries but positively associated with IPV in four countries, and had no association in most countries. Boudreaux (2018) finds that much of the literature from South Asia suggests land rights prevents or mitigates the harm of IPV. Findings from other parts of the world are mixed suggesting either an opposite effect or effects on some types of IPV.

Existing studies use different measures of land rights and of violence, are often based on small samples, and do not sufficiently account for endogeneity. Furthermore, there are few rigorous evaluations on the links between land tenure and IPV or gender-based violence more broadly, especially in sub-Saharan Africa. According to a 2018 systematic review of gender-based violence literature in Ethiopia, there are limited impact evaluations for Ethiopia for interventions of any kind, land or otherwise (Cordon et al. 2018).

Contrasting sole and joint ownership, several studies find conflicting results, again highlighting the role of context. Based on the 'Work-In-Household' framework, Gahramanov et al. (2021) theorize that private ownership of property by a married woman may reduce the amount of household services she is willing to perform, and in response, the husband might use violence to force her to supply labor. In contrast, joint ownership may act as "compensation" for women, inducing them to supply more labor and lowering the chances that men use violence to coerce them. Supporting this theory, Gahramanov et al.'s (2021) study of household-level survey data for several Latin American countries finds that sole property ownership is associated with higher levels of IPV for married women, while joint property ownership is associated with lower levels of IPV. Along the same lines, analyzing DHS survey data in the DRC, Sano and Sedziafa (2017) find that women's independent ownership was associated with more

physical and sexual IPV than women's joint ownership. On the other hand, using 2010-2011 Zimbabwe DHS data, Wekwete et al. (2014) find that women's joint ownership is associated with more sexual violence than women's lack of any type of land ownership at all.

Research is beginning to reveal an interconnected relationship among women's land rights, violence, and productivity. Using case studies in Ethiopia, Badstue et al. (2020) found that women's fear of physical violence for violating cultural norms around land and agriculture stifled women's productivity and livelihoods. Their key informant interviews further revealed that IPV can cause psychological trauma to women, leading to a loss of confidence and productivity, including in farming and livelihoods. More generally, when overall insecure land tenure for the household means that agricultural production is low, there may be tension in the household that leads to IPV (Ruark 2020).

V. DATA AND METHODS

DATA COLLECTION AND SAMPLING

This study uses the same sampling strategy as the baseline and endline surveys. See the Cloudburst (2016) for details about the data collection and sampling used in 2008 and 2015. In 2021 we resurveyed the households that were surveyed in 2008 and 2015 in all but three circumstances: households from Tigray,12 *kebeles* in Amhara, and households covered by ELAP. We did not visit households in Tigray and the 12 *kebeles* in Amhara because of ongoing conflict. We did not visit households covered by ELAP because ELAP specifically targeted households with higher potential for agricultural productivity and we did not want this to bias our results. When a male head of household had multiple wives, we interviewed up to five of his wives.

The sample for the survey in 2021 includes 2,306 households from 183 *kebeles* in 19 *woredas* in the Amhara, Oromia and SNNP Regions. Ten households were dropped from the sample because the information they provided about their certification status was not complete. In this 2021 sample, 123 households did not have certificates of any type. Three-hundred and eighty-eight households only had first-level certificates and had not participated in second-level certification or survey; 394 households were surveyed for second-level certificates without receiving them, and 1,391 households received second-level certificates.[27] Of the 2,296 households, 78 percent were headed by a man and 22 percent were headed by a woman. Across D/MHHs, we interviewed 1,785 wives, of which 111 were in polygynous marriages. In polygynous households, we surveyed at least two of the wives.

In all 183 *kebeles*, we used the *Kebele* Authority Survey (Annex 3) to interview local officials, leaders, or other representatives with high-level knowledge of land practices, policies, and procedures in the *kebele*. We only surveyed authorities who had lived in the *kebeles* since 2017 to focus on authorities who had been implementing the ELTAP/ELAP programs. Sixty-nine percent of the land authorities interviewed served as *kebele* chairs, vice-chairs, or *kebele* managers; 34 percent were representatives of a civil society organization or other community group; 29 percent were agricultural extension providers; 25 percent served on a land administration committee; 20 percent were *kebele* security officers; and 13 percent were elders (these categories are not mutually exclusive). EconInsights attempted to achieve gender balance. However, they were unable to identify as many female land authorities with high-level land knowledge in the *kebeles*, and 75 percent of the *kebele* authorities interviewed were male.

We held 21 FGDs (seven per region) with women and men to better understand contextual factors, explanations, and mechanisms related to the quantitative analyses (see Annex 3 for FGD Guides). We recruited FGD participants by inviting respondents of the household head and wives' surveys. FGDs were carried out separately for women and men, in groups of 5 to 7 participants. We organized 5 types of FGDs: men who were between 18 and 45 years old, men who were 46 or older, women in monogamous marriages who were between 18 and 45 years old, women in monogamous marriages who were 46 or older, and women in polygynous marriages. The team recruited FGD participants

[27] In the difference-in-differences analysis, we classify a household as "treated" if they were surveyed for or received a second-level certificate (see Table 5.3). In the continuous treatment analysis of second-level certification, households that were surveyed but never received a second-level certificate have 0 years of treatment.

beginning with the first surveyed village in the region and continued recruiting until they reached the number of participants required for the region.

Data collection for all surveys and focus groups took place between April 1 and May 16, 2021. EconInsights trained and deployed 43 enumerators and seven supervisors (40 percent of them were women) who were also trained to conduct focus groups and to take notes during FGDs. A Landesa supervisor co-trained and co-supervised all the FGDs and visited random houses to ensure that the enumerators were following Institutional Review Board (IRB) and COVID-19 protocols. During fieldwork, the political unrest extended to some of the *woredas* in the Amhara region. To mitigate risk, the team skipped 155 households in all 12 *kebeles* in Dawa Chefa *woreda* and the Yelenena Wach *Kebele* of Kewit Woreda in North Shewa of the Amhara region due to security concerns. Table 5.1 summarizes the sample size and methods for each of the 2008, 2015, and 2021 survey rounds.

Table 5. 1. Summary of Tools and Methods

DATA COLLECTION TOOLS/SAMPLE SIZE	SAMPLING STRATEGY
2008 ELTAP AND LATER ELAP HOUSEHOLDS	
1) Head of HH surveys Treatment = 24 *woredas* X 8 *kebeles* X 15 HH's = 2,880 Control= 24 *woredas* X 3 *kebeles* X 10 HH' s = 720 Total = 3,600 2) Wive(s) Surveys: with first and second wife (if such exists) in male headed households: Total = 2,754 wives (including 111 second wives from polygynous HH's)	Multi-stage sampling Regions: Tigray, Amhara, Oromia, and SNNP *Woredas*: 6 *woredas* from each region. *Kebeles*: 8 treatment *kebeles* randomly selected out of the 15 program *kebeles*. 3 control *kebeles* Gotts/Qushets/Villages: 25 percent by *kebele*. Households: 15 households per treatment *kebele*. 10 households per control *kebele* distributed randomly from selected villages.
2015/HH'S ASSIGNED TO ELTAP THAT RECEIVED TREATMENT FROM ELTAP OR ELAP	
Total HH surveys = 4,319 Total wives surveys = 2,754 Households with no certification = 301 Households with first-level certification only = 1,787 Households with second-level survey with no certificate = 1,186 Households with second-level certificates = 1,045	Panel, using heads of HH and wives from 2008 data collection
2021	
Total HH surveys = 2,306 Total wives surveys = 1,785 Households with no certification = 123 Households with first-level certification only = 388 Households with second-level survey with no certificate = 394 Households with second-level certificates = 1,391	Panel, using head of HH and wives from 2008 and 2015 with these exceptions: • Households from Tigray, • Twelve kebeles in Amhara, • Households covered by ELAP because ELAP specifically targeted households with higher potential for agricultural productivity.

Source: Cloudburst (2016) Ethiopia Strengthening Land Tenure and Administration Program Endline Report. An Impact Evaluation of the Effects of Second-Level Land. USAID. Certification Relative to First-Level Certification

It was critical for the design to interview the same households in 2021 that had been interviewed in 2008 and 2015. To find these households in 2021, EconInsights used names of the household heads and GPS household information. After removing Tigray and the ELAP subsample, as well as the 12 *kebeles* in the Amhara region, EconInsights surveyed 2,306 households. They were unable to find 3 percent of the households. Table 5.2 summarizes the reasons for their attrition.

Table 5. 2. Attrition Reasons

ATTRITION REASONS	NUMBER OF OBSERVATIONS
Moved to another area (region, zone, and *woreda*)	30
Death of head of household and separation/dissolution of household	14
Household separation (other reasons)	10
Divorced and household is separated/dissolved	2
Conflicts between families on land inheritance	3
Sickness: couldn't respond due to serious illness	5
Not available at the survey time in their residence	4
OTHER (Households couldn't be tracked; Households in conflict with a neighbor/head at the hospital; Duplication of households on the track sheet given; Loss of collected data; Old age; Refused)	9
Total	**77**

Source: EconInsights (2021) Fieldwork report. Impact Evaluation of Land Certification in Four Regions in Ethiopia.

The head of household (male and female) surveys, wives' surveys, and *kebele* authority surveys were administered digitally by teams of EconInsights enumerators using SurveyCTO on tablets. Head of household (male and female) surveys were carried out by teams of enumerators (one male/one female) using contact lists (names, addresses) from the 2015 data collection. If the head of household at the address was the same individual surveyed in the 2015 data collection, we surveyed him or her using a Computer-Assisted Personal Interview (CAPI) tablet with SurveyCTO (if not, we interviewed the present head of household, but only after multiple attempts to locate the original head).

Women for the wives' surveys were recruited from within the dual-headed households at their homes. First, male household heads identified his wife or wives in the household roster at the start of the survey. If the male head of household at the address was the same as the 2015 survey data collection, and he agreed that we may interview his wife or wives, we attempted to interview them even if they were not the same wife or wives from the 2015 survey. If there was only one wife, she was given the long version of the survey that contained questions on IPV. If there was more than one wife, the enumerators rolled a die, and the wife with the largest number received the long survey with questions about IPV, and all other wives received the same survey but without the IPV questions. Although the

2021 survey asked wives whether they had participated in prior survey rounds, neither the 2021 nor 2015 survey rounds uniquely identify wives as individual women over time.

All survey information was encrypted at all points of the data flow process, from point of origin (interview) to storage on local devices and to the cloud. Once data was finally stored in a computer, the end-user could use the encryption key to decrypt and read the data. When sharing data folders and files with Landesa, items were stored in a secured folder on one of Landesa's drives with access restricted to only the principal investigators, research assistants at Landesa, and Landesa's Information Technology administrators.

For the qualitative FGDs, EconInsights survey enumerators recruited participants from the survey participants by asking if they voluntarily agreed to participate. EconInsights and Landesa conducted 21 FGDs with men and women in the Amhara, Oromia, and SNNP Regions. The data collectors recorded interviews and FGD notes in their tablets. Landesa trained the data collectors on ethical guidelines to conduct qualitative research, including safeguards related to gender-based violence; safety protocols to mitigate the risk of COVID-19 infection; applying techniques to identify the most significant changes in participants' experiences; and how to record participants' responses. EconInsights mobilized participants to safe, private, and convenient places, and conducted women-only and men-only FGDs. The team used data management and record retention instructions harmonized with WHO and United States Government recommendations for data management to protect women respondents for IPV research. EconInsights coded the written transcripts of FGDs using Atlas Ti, translated them into English, and sent the anonymized coded transcripts to Landesa for analysis and write-up. Transcripts and any accompanying field notes do not name participants and only have an assigned identification number. EconInsights kept any documents that may include names of participants separate from their responses.

Detailed recruitment, data collection, data management procedures, and ethical assurances are in the IRB protocol. The IRB committee of the International Center for Research on Women (ICRW) approved the IRB protocol for this study, prepared by Landesa and EconInsights, in accordance with the US Federal Regulation 45 CFR 46 (the Common Rule). The IRB protocol also contained measures to mitigate political risks through participation in this study in the country and localities where the study took place to ensure that the risk of participating in this study does not outweigh the benefits of such participation following the no-harm principle. A Community Assessment confirmed that national and local government had not put restrictions in place on movement or businesses during the expected staff training and data collection period, due to COVID-19. In the assessment, we reviewed national/local government categorizations of risk zones/clusters, contacted community leaders to discuss and explain research as well as seek written permission to enter communities for data collection purposes, and contacted key informants within communities to gauge the communities' likelihood of accepting in-person data collection or visits from individuals who may not be part of the community.

DIFFERENCE-IN-DIFFERENCES ANALYSIS

We estimate the impact of second-level certification using the 2008 and 2021 survey rounds. The DID analysis is used to show the change in the outcomes of interest over time in treatment versus comparison groups. This type of analysis was also conducted by Cloudburst (2016) as the main analysis that compared the effects of second-level certification with the effects of first-level or no certification using 2008 and 2015 data.

For our estimates, the treatment group includes households that either received a second-level certificate or had their land surveyed as part of a second-level certification program. The comparison group includes households that received only first-level certificates or did not receive any certification at all. This corresponds to Cloudburst's Treatment Group D, which analyses indicated was better powered to detect smaller changes in more variables in both the 2008-2021 and 2008-2015 analyses[28]. Table 5.3 describes which households are dropped from the analysis and which households are categorized as treatment versus control. Annex 1 shows DID results for all Treatment Groups.

Direct comparisons between this study's DID results and Cloudburst's should be made with caution for several reasons. First, the 2008-2021 DID results do not include Tigray or 12 *kebeles* in Amhara due to the political unrest at the time of the 2021 survey. Second, the two evaluations approached the potential bias in the ELAP subsample (in which households assessed as having greater productivity potential were prioritized for certificates) differently. This evaluation excludes the ELAP sample; the Cloudburst evaluation included the ELAP sample and used entropy balancing to account for the bias. Third, 45 percent of the original control group had received certificates by 2021 and can no longer be used as a control. The adjustments we had to make leave us with less statistical power than the Cloudburst evaluation. This constrains our ability to detect statistically significant impacts on some outcomes. Finally, to determine whether the impact of the treatment varied depending on who was treated, we used a triple-difference approach rather than the subgroup analysis used by Cloudburst. This approach allows us to maximize statistical power and analyze both binary and continuous variables using the same method.[29]

[28] Annex 1 presents a technical discussion of statistical power considerations for the DID analysis.
[29] The Cloudburst evaluation conducts heterogeneity analysis using subsample analysis for binary variables and using Local Regression (LOESS) plots for continuous variables.

Table 5. 3. 2008-2021 Treatment and Comparison Groups

	Certification Status as of 2021				
Certification Status at Baseline	None	1st Level	2nd Level Survey	2nd Level Certificate	Total
None	84	165	196	619	1,064
1st Level	39	223	198	772	1,232
Total	123	388	394	1,391	2,296

Removed

Control Group

Treatment Group

For assessing impact using DID, we used the following equation:

$$Y_{it} = \beta_0 + \beta_1 Post_t + \beta_2 Post_t \cdot Intervention_i + \alpha_i + \varepsilon_{it} \qquad (1)$$

where Y_{it} represents each of the 22 outcomes of interest for household or wife i in time t. $Post_t$ is a dummy variable equal to 1 when the observation corresponds to the follow-on survey and 0 when it is from the baseline survey. $Intervention_i$ is a dummy variable equal to 1 if household i received or was surveyed for a second-level certificate on any plot of land and 0 otherwise. α_i represents household fixed effects for household-level outcomes or wife fixed effects for wife-level outcomes.[30] Finally, ε_{it} is the error term for household or wife i at time t and standard errors are clustered at the *kebele* level.

In this equation, β_0 represents the baseline average value of outcome Y for the control group, β_1 is the coefficient that captures the impact of time on the control group, and β_2, the DID estimate, captures the average treatment effect, or the difference in changes over time between the treatment and control groups.[31]

To determine whether the impact of the treatment varied depending on what type of households were treated, we estimate the triple difference

$$Y_{it} = \beta_0 + \beta_1 Post_t + \beta_2 Post_t \cdot Intervention_i + \beta_3 Post_t \cdot X_i + \beta_4 Post_t \cdot Intervention_i \cdot X_i + \alpha_i + \varepsilon_{it} \qquad (2)$$

where Y_{it}, $Post_t$, $Intervention_i$, α_i, and ε_{it} are defined as above and X_i represents the characteristic assessed:

- Baseline information on the sex, age, and marital status of the household head
- Household wealth, land holdings, or distance to the regional capital city
- Whether the wife is in a polygynous union

The coefficient β_4 represents the triple difference estimate. A statistically significant β_4 coefficient implies that, in fact, the average impact of the treatment varies depending on who was treated.

[30] Note that without household fixed effects, the DID regression equation would include a dummy variable indicating whether a household is in the treatment or control group. However, treatment status is captured by the household or wife fixed effects and is therefore not included as a separate variable in the regression.

[31] DID analysis assumes that in the absence of treatment, the control and treatment groups would have the same change over time in each outcome variable.

Tables 5.4 and 5.5 show the descriptive statistics of the outcome variables and the mediating variables for heterogeneity analysis in the DID sample. At baseline in 2008, before any households received second-level certificates or had their land surveyed for second-level certificates, treatment and control groups were similar in terms of the variables of interest and the outcomes the intervention expects to affect. As expected, we do not observe statistically significant differences at baseline for households or wives in Treatment Group D (households with second-level certificate or that had their land surveyed as part of a second-level certification program) and the Comparison Group D (households with only first-level certificates or no certification at all).

Table 5. 4. Baseline Household Summary Statistics, by DID Treatment Status (Group D)

	Treatment Group D			Comparison Group D		
	Mean	S.D.	N	Mean	S.D.	N
Access to credit:						
Amount of credit taken by HH for farming (ln(Birr+1))	0.11	0.88	762	0.11	0.92	227
HH took credit for farming (%)	0.02	0.12	762	0.00	0.00	227
HH used land certificate to obtain credit (%)	0.02	0.16	762	0.04	0.20	227
Land disputes:						
Average time to resolve HH's land disputes (ln(months+1))	2.16	1.06	226	2.02	0.94	35
HH experienced boundary or encroachment dispute (%)	0.08	0.27	1,799	0.05	0.21	470
Land rental activity:						
Land area rented out by HH (hectares)	0.08	0.64	1,799	0.06	0.52	470
Number of parcels rented out by HH	0.16	0.62	1,799	0.08	0.35	470
Soil & water investments:						
HH invested in soil or water conservation (%)	0.45	0.50	1,799	0.34	0.48	470
Perceived land tenure security:						
HH expects it will be able to bequeath its land (%)	0.39	0.49	1,750	0.27	0.44	452
HH expects a land redistribution within five years (%)	0.24	0.43	1,799	0.24	0.43	470
HH feels more secure in credit transactions with certificate holder (%)	0.83	0.37	1,799	0.87	0.33	470
Mediating variables for heterogeneity analysis:						
Female-headed HH (%)	0.16	0.37	1,799	0.17	0.37	470
HH head is a widow (%)	0.12	0.33	1,799	0.14	0.35	470
Age of HH head (years)	46.35	13.59	1,799	45.91	13.87	470
HH wealth index	-0.47	1.13	1,799	-0.61	1.14	470
Area of land possessed by HH (hectares)	1.68	1.78	1,798	1.49	1.83	469
Distance to regional capital (km)	140.63	99.69	1,255	144.24	114.55	341

All percentages are presented on a scale of 0 to 1. For example, a binary variable with a mean of 0.03 represents 3%.

Table 5. 5. Baseline Wife Summary Statistics, by DID Treatment Status (Group D)

	Treatment Group D			Comparison Group D		
	Mean	S.D.	N	Mean	S.D.	N
Land disputes:						
Wife experienced land disputes on her parcels (%)	0.01	0.09	1,501	0.00	0.00	389
Women's empowerment & decision-making over land:						
Wife possesses land in her name (%)	0.49	0.50	1,501	0.47	0.50	389
Wife has certificate for land in her possession (%)	0.08	0.28	1,501	0.02	0.15	389
Wife decides what crops to grow on her land, self-reported (%)	0.07	0.26	1,501	0.05	0.21	389
Wife decides what crops to grow on her land, reported by head (%)	0.50	0.50	1,501	0.54	0.50	389
Wife can rent out her land, self-reported (%)	0.02	0.13	1,501	0.02	0.13	389
Wife can rent out her land, reported by head (%)	0.63	0.48	1,501	0.65	0.48	389
Number of parcels possessed by wife solely or jointly with spouse	1.66	2.29	1,501	1.32	2.07	389
Number of parcels possessed by wife solely	0.08	0.49	1,501	0.08	0.50	389
Area of land possessed by wife solely or jointly with spouse (hectares)	0.77	1.27	1,501	0.53	0.85	389
Area of land possessed by wife solely (hectares)	0.04	0.26	1,501	0.06	0.40	389
Mediating variables for heterogeneity analysis:						
Polygynous HH (%)	0.07	0.26	1,501	0.08	0.27	389
Age of HH head (years)	46.42	13.47	1,501	46.10	13.85	389
HH wealth index	-0.43	1.13	1,501	-0.57	1.14	389
Area of land possessed by HH (hectares)	1.79	1.97	1,500	1.69	2.36	388
Distance to regional capital (km)	141.38	101.65	1,019	147.08	116.69	280

All percentages are presented on a scale of 0 to 1. For example, a binary variable with a mean of 0.03 represents 3%

CONTINUOUS TREATMENT ANALYSIS

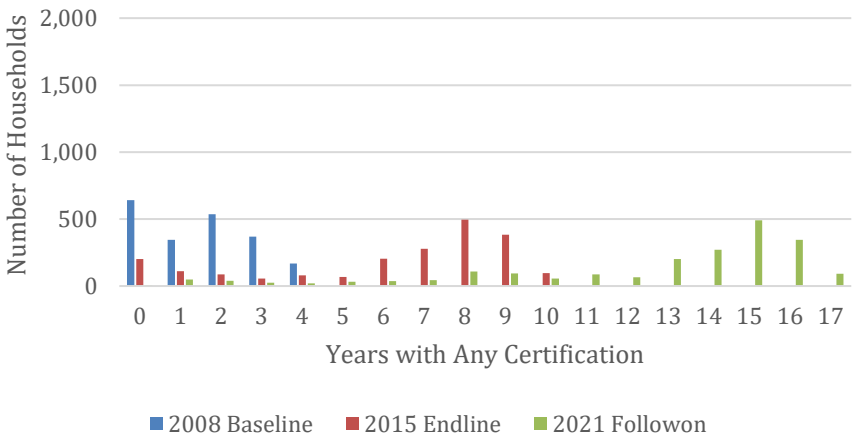
Many IE methods (including DID) conceptualize the treatment as a binary variable — each observation is either part of the treatment or the control group — and the analysis estimates how the average change in outcomes for the treated group compares to the average change in outcomes for the control group. A Continuous Treatment (CT), on the other hand, allows us to consider more gradual changes in the treatment. This would be the case, for example, if the treatment was a medicine that was administered in varying dosages, and we wanted to assess the effects of the different dosages on the patients.

For a more nuanced exploration of the effect of the second-level certificates, and of any certification, on the outcomes of interest, we use CT in our analysis. To expand our analysis from only second-level certificates and to better capture the effect of having the actual certificate in hand, we define treatment in two ways. Under the first definition, a household is considered "treated" if it received *any* certification, either first-level or second-level certification, on any plot of land. Under the second definition, a household is considered "treated" only if it received second-level certification on any plot of land. Note that these two ways of defining treatment differ from the classification used for the DID analysis. Therefore, comparisons of the results should be done with caution — we did not apply the two methods with the intent of comparison, but rather to see how results evolved since 2016 and to contribute to a more nuanced set of learnings.

Rather than comparing treated households with control group households, our CT estimation considers the number of years for which the household has been treated. This allows us to identify the effects on the outcome by year of certification. We estimate the number of years in the same way for the two treatment groups. For households with any certificate, we calculate the maximum number of years that each household has had any plot of land with a first- or second-level certificate. For the households with second-level certificate, we calculate the maximum number of years that each household has had any plot of land with a second-level certificate.

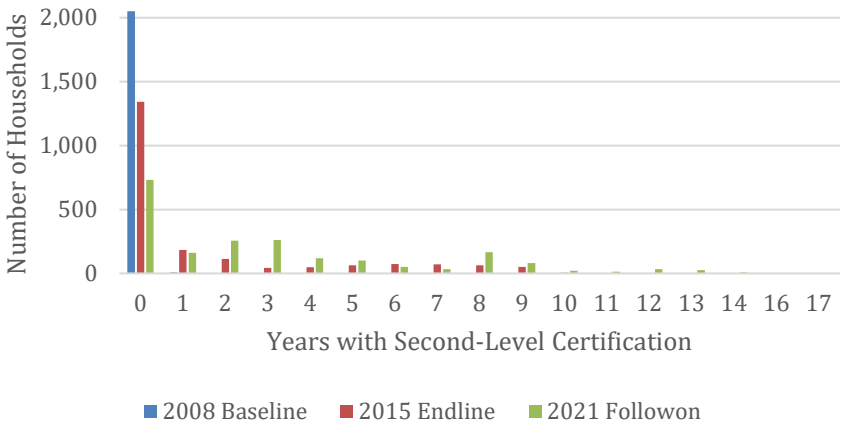
The benefit of using continuous treatment is that this method allows us to better account for the uneven rollout of the ELTAP and ELAP programs over time — we can now distinguish the impact of certificates granted in 2008 from those granted years later. Figure 5.1 shows the number of households that had any certification when the surveys were administered in 2008, 2015, and 2021. Figure 5.2 shows the number of households with second-level certification in 2008, 2015, and 2021. These distributions are similar for FHHs.

Figure 5.1. Households' Years with Any Certification in 2008, 2015, and 2021



Source: Authors' calculations.

Figure 5. 2. Households Years with Second-level Certification in 2008, 2015, and 2021



Source: Authors' calculations.

We model our approach on Carter et al. (2019). This approach allows the impacts of treatment to change over time by adding the squared number of years to the estimation model and controls for household fixed effects over time. Using the panel data collected in 2008, 2015, and 2021, the CT analysis estimates the impact of years of certification on the same set of outcome variables as the DID analysis with the following changes:

- We dropped the outcome of whether the household took any credit for farming purposes in the past year because there were too few observations of households taking credit for analysis to draw meaningful conclusions.

- We added the probability of the household renting out any amount of land.
- We added a family of outcomes for households' land and agricultural investments including planting trees or perennial crops and using tractors, oxen, improved seeds, fertilizers, and pesticides, and renting in land.
- We used only wives' self-reported decision-making on land.

For the CT outcome variables, we estimated the model

$$Y_{it} = \beta_1 T_{it} + \beta_2 T^2_{it} + \beta_3 s_2 + \beta_4 s_3 + \boldsymbol{F}_{it}' \beta_5 + \alpha_i + \varepsilon_{it} \qquad (3)$$

where Y_{it} is the continuous outcome of interest for household i in time t; T_{it} is the number of years household i has had a land certificate by time t; s_2 and s_3 are survey round dummy variables; $\boldsymbol{F}_{it}$ is a vector of control variables, including a binary indicator for FHHs in the estimations for household-level outcomes and a binary for polygynous marriage in estimations for wife-level outcomes; α_i are household fixed effects for household-level outcomes and wife fixed effects for wife-level outcomes; and ε_{it} is a random disturbance with a standard normal distribution. As in Carter et al. (2019), we employ Mundlak instruments and model the household fixed effects as a linear projection onto observed individual, household, and *kebele* characteristics, plus a disturbance. The household fixed effect is defined using averages of time-variant characteristics over all waves:

$$\alpha_i = d_0 + \bar{\boldsymbol{X}}_i' \bar{\delta} + v_i \qquad (4)$$

where $\bar{\boldsymbol{X}}'_i$ is a vector of observables relevant to the outcome of interest for household i.[32]

Probability models for the binary outcomes are given by

$$E(Z_{it}) = exp(\Phi) \,/\, 1 + exp(\Phi) \qquad (5)$$

with a binary outcome Z_{it} and with Φ represents the equation

$$\Phi = \beta_1 T_{it} + \beta_2 T^2_{it} + \beta_3 s_2 + \beta_4 s_3 + \boldsymbol{F}_{it}' \beta_5 + \alpha_i + \mu_{it} \qquad (6)$$

μ_{it} is a random error with a standard logistic distribution. Household fixed effects α_i are estimated in the same way as for continuous outcomes.

We estimate equations 3 and 6 to measure impacts of second-level certification and of any certification. For household-level variables, we estimate the equations first on a balanced panel of 2,059

[32] We control for the mean years since receiving a certificate, but we do not include the mean of the squared term due to multicollinearity. It is not necessary to control for the means of the survey-round dummies because we analyze balanced panels.

households[33] and then for separate subgroups of FHH and D/MHH. For wife-level outcomes, we estimate the equations for a balanced panel of 657 wives who appeared in all three survey rounds.[34] Estimations for wives include controls for being in a polygynous marriage.[35] Table 5.6 lists the control variables used for each family of outcomes. Where these variables were likely to be endogenous to certification (*e.g.,* proxies for wealth such as total area owned, expenditures, and livestock assets), estimations controlled for their baseline values instead of the time-varying values and the average across the three rounds of data.

[33] That is, we restrict the sample to households that were surveyed in all three survey rounds.
[34] Although each wife has a Household ID and a Wife ID in each survey round, neither the 2015 nor the 2021 sampling processes attempted to follow and uniquely identify a wife across rounds such that she would always have the same combination of Household ID and Wife ID in every round. To construct the wives panel, we first restricted the sample to households that appeared in all three rounds, kept only observations for which the same Household ID and Wife ID appeared in all three rounds, and then dropped wives who in 2021 said they had neither participated in the 2008 nor 2015 surveys.
[35] While we allow the intercept to differ for wives in polygynous unions, relative to those in monogamous unions, we do not conduct subsample analysis on polygynous wives because they comprise less than 12 percent of the sample in the panel of wives evaluated in the CT analysis.

Table 5. 6. Co-Variates used in CT Analysis.

VARIABLE DEFINITION	ACCESS TO CREDIT	LAND DISPUTES (HH-LEVEL)	LAND DISPUTES (WIFE-LEVEL)	LAND RENTAL ACTIVITY	INVESTMENTS IN AG. INPUTS	SOIL AND WATER CONSER-VATION	PERCEIVED LAND TENURE SECURITY	WOMEN'S EMPOWER-MENT AND DECISION-MAKING	TIME-VARIANT OR INVARIANT
Level of cash crop production in *kebele*				X	X			X	Time-invariant
Number of working age males in household		X	X	X				X	Time-variant
Number of working age adults in household				X					Time-variant
Age of household head	X	X	X	X	X	X	X	X	Time-variant
Number of children								X	Time-invariant (baseline values)
Male head is literate	X	X	X	X	X	X	X	X	Time-variant
Distance from home to land administration office (km)		X	X						Time-invariant
Household has parcels where soil erosion is caused by water						X			Time-variant
Gender of household survey respondent							X		Time-variant
Confident that institutions can enforce land rights							X		Time-variant
Past land redistribution in *kebele*		X	X				X		Time-variant
Household expenditures per capita (Birr)	X	X	X	X	X	X	X	X	Time-invariant (baseline values)
Area of land owned by household (hectares)	X								Time-invariant (baseline values)
Number of oxen, cows, heifers, bulls, and horses household owns	X								Time-invariant (baseline values)
Land area rented out by household (hectares)	X								Time-invariant (baseline values)
Household owns house in town	X								Time-invariant (baseline values)

VARIABLE DEFINITION	ACCESS TO CREDIT	LAND DISPUTES (HH-LEVEL)	LAND DISPUTES (WIFE-LEVEL)	LAND RENTAL ACTIVITY	INVESTMENTS IN AG. INPUTS	SOIL AND WATER CONSER-VATION	PERCEIVED LAND TENURE SECURITY	WOMEN'S EMPOWER-MENT AND DECISION-MAKING	TIME-VARIANT OR INVARIANT
Household owns kiosk	X								Time-invariant (baseline values)
Household owns oxen				X					Time-invariant (baseline values)
Quantity of fertilizer and pesticide (kg/ha) applied by household									Time-invariant (baseline values)
Whether household used improved seed for any crop									Time-invariant (baseline values)
Whether household used draught animal traction or tractor									Time-invariant (baseline values)
Household lost land in last 30 years							X		Time-invariant (baseline values)
Region	X	X	X	X	X	X	X	X	Time invariant
Survey round	X	X	X	X	X	X	X	X	Time-variant
FHH	X	X		X	X	X	X		Time-variant
Wife is in polygynous union			X					X	Time-variant

Tables 5.7 and 5.8 show the descriptive statistics of the outcome variables and control variables for the CT analysis sample. In 2021, we surveyed 2,306 households. However, Tables 5.7 and 5.8 present summary statistics for the 2,059 households that are included in the CT analysis. This sample excludes households that are missing data on whether they had first-level certification at baseline, whether they had certification at follow-on, or the year in which the household first received a first- or second-level certificate. It also excludes households that report having a certificate at baseline but not at follow-on.

The sample is comprised of 2,059 households. The CT analysis shows the effect of every year of certification on the outcomes of interests. For this analysis, we define "treatment" in two ways. We call the first treatment "any certificate." When we speak of the effects of the years of having any certificate on an outcome, we report the effect of the number of years of having first- or second-level certificates for the plot with the maximum of years owned by the household. In 2008, there were 1,418 households with any certificate. By 2021, 2,054 households are classified as having "any certificate."

We call the second treatment "second-level certificate." For the CT analysis, when we speak of the effects of having second-level certificate on an outcome, we report the effect of the number of years of having second-level certificates for the plot with the maximum number of years with second-level certification. In 2008, none of the households had second-level certificates. In 2021, 1,328 households had second-level certificates. Note that these two groups are different; in 2008, households in the sample already had on average 1 year with any certificate. About 21 percent of the sample are FHHs. Twenty-nine percent of all households are in Amhara, 33 percent are in Oromia and 37 percent in SNNP. On average, heads of household are about 56 years old and households own 1.59 hectares of land. Households received first- or second-level land certificates around 12.5 years ago, on average. However, the average time since receiving second-level certificates is 3 years. About 53 percent of household heads are literate. On average, households were 11.56 kilometers from the nearest registration office.

Table 5. 7. CT Sample Household Summary Statistics, by Survey Round

	2008			2014/15			2021		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Outcome variables:									
Amount of credit taken using land certificate (ln(Birr+1))	0.29	1.61	2,059	0.29	1.61	2,059	0.17	1.35	2,059
HH used land certificate to obtain credit (%)	0.03	0.18	2,059	0.03	0.18	2,059	0.02	0.12	2,059
Average time to resolve HH's land disputes (ln(months+1))	2.17	1.06	243	1.51	0.95	128	1.49	0.82	87
HH experienced boundary or encroachment dispute (%)	0.07	0.26	2,059	0.06	0.25	2,059	0.03	0.18	2,059
Number of parcels rented out by HH	0.15	0.59	2,059	0.40	0.94	2,059	0.35	0.95	2,059
Land area rented out by HH (hectares)	0.08	0.65	2,059	0.17	0.49	2,059	0.14	0.42	2,059
HH rented out land (%)	0.09	0.28	2,059	0.22	0.41	2,059	0.17	0.38	2,059
Number of trees planted per hectare	127.33	535.67	2,058	196.42	1131.60	2,059	105.54	819.75	2,059
Number of perennials planted per hectare	268.69	744.37	2,058	178.82	1189.46	2,059	162.49	734.79	2,059
Land area rented in (hectares)	0.00	0.00	2,059	0.02	0.17	2,059	0.01	0.10	2,059
Quantity of fertilizer and pesticide applied (kg/ha)	368.45	1249.52	2,059	36.88	178.25	2,059	120.50	213.66	2,059
HH uses oxen or tractors (%)	0.84	0.37	2,059	0.29	0.46	2,059	0.77	0.42	2,059
HH uses improved seed (%)	0.33	0.47	1,997	0.23	0.42	2,059	0.56	0.50	2,059
HH invested in soil or water conservation (%)	0.44	0.50	2,059	0.52	0.50	2,059	0.42	0.49	2,059
HH expects it will be able to bequeath its land (%)	0.37	0.48	1,995	0.98	0.12	2,059	0.96	0.19	2,059
HH expects a land redistribution within five years (%)	0.24	0.43	2,059	0.07	0.25	2,059	0.10	0.30	2,059
HH feels more secure in credit transactions with certificate holder (%)	0.85	0.36	2,059	0.48	0.50	2,059	0.93	0.25	2,059
Years since receiving first- or second-level certificate	1.55	1.31	2,059	6.14	3.08	2,059	12.54	4.04	2,059
Years since receiving second-level certificate	0.00	0.06	2,059	1.46	2.58	2,059	3.02	3.42	2,059
Control variables:									
Female-headed HH (%)	0.16	0.37	2,059	0.20	0.40	2,059	0.21	0.41	2,059
Indicator of confidence in certificate (%)	0.78	0.41	2,059	0.94	0.24	2,059	0.77	0.42	2,059
Region									
Amhara (%0	0.29	0.45	2,059	0.29	0.45	2,059	0.29	0.45	2,059
Oromia (%)	0.33	0.47	2,059	0.33	0.47	2,059	0.33	0.47	2,059
SNNP (%)	0.37	0.48	2,059	0.37	0.48	2,059	0.37	0.48	2,059
Age of HH head (years)	46.22	13.44	2,059	52.22	13.44	2,059	55.62	13.84	2,059
HH head is literate (%)	0.53	0.50	2,059	0.53	0.50	2,059	0.53	0.50	2,059
Household expenditures per capita (Birr)	208.94	203.49	2,059	1481.11	1645.66	2,059	5,738.79	5,375.25	2,059
Land area owned by HH (hectares)	1.65	1.82	2,058	1.55	2.04	2,059	1.59	2.37	2,059
Household owns house in town (%)	0.08	0.27	2,059	0.11	0.31	2,058	0.18	0.38	2059
Household owns kiosk (%)	0.03	0.16	2,059	0.02	0.15	2,058	0.04	0.20	2,059
Number of oxen, cows, heifers, bulls, and horses household owns	4.64	4.23	2,059	4.74	5.48	2,059	4.12	3.86	2,059

Number of working age males in household	1.81	1.21	2,059	1.79	1.21	2,059	1.83	1.28	2,059
Distance from home to land administration office (km)	11.56	63.12	2,056	11.56	63.12	2,056	11.56	63.12	2,056
Past land redistribution in kebele (%)	1.00	0.07	2,059	0.70	0.46	2,059	0.97	0.17	2,059
Number of working age adults in household	3.49	1.79	2,059	3.48	1.70	2,059	3.57	1.79	2,059
Household owns oxen (%)	0.70	0.46	2,059	0.67	0.47	2,059	0.60	0.49	2,059
HH has parcels where soil erosion is caused by water (%)	0.31	0.46	2,017	0.43	0.50	2,059	0.41	0.49	2,059
Woman responded to HH survey (%)	0.17	0.37	2,058	0.20	0.40	2,059	0.22	0.41	2,059
Household lost land in last 30 years (%)	0.01	0.11	2,059	0.04	0.21	2,059	0.02	0.15	2,059
Confident that institutions can enforce land rights (%)	0.77	0.42	2,059	0.47	0.50	2,059	0.89	0.31	2,059
Size of cash crop sector in kebele (ordinal measure)									
0	0.76	0.43	2,059	0.76	0.43	2,059	0.76	0.43	2,059
2	0.08	0.27	2,059	0.08	0.27	2,059	0.08	0.27	2,059
3	0.05	0.22	2,059	0.05	0.22	2,059	0.05	0.22	2,059
4	0.04	0.20	2,059	0.04	0.20	2,059	0.04	0.20	2,059
5	0.03	0.17	2,059	0.03	0.17	2,059	0.03	0.17	2,059
6	0.01	0.09	2,059	0.01	0.09	2,059	0.01	0.09	2,059
8	0.02	0.12	2,059	0.02	0.12	2,059	0.02	0.12	2,059

All percentages are presented on a scale of 0 to 1. For example, a binary variable with a mean of 0.01 represents 1%.

Table 5. 8. Sample Wife Summary Statistics, by Survey Round

	2008			2015			2021		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Outcome variables:									
Wife experienced land disputes on her parcels (%)	0.00	0.06	657	0.02	0.13	657	0.04	0.19	657
Wife possesses land in her name (%)	0.60	0.49	657	0.98	0.13	657	0.96	0.19	657
Wife has certificate for land in her possession (%)	0.08	0.27	657	0.77	0.42	657	0.84	0.37	657
Wife decides what crops to grow on her land, self-reported (%)	0.07	0.26	657	0.70	0.46	657	0.73	0.44	657
Wife can rent out her land, self-reported (%)	0.02	0.13	657	0.14	0.35	642	0.54	0.50	627
Number of parcels possessed by wife solely or jointly with spouse	1.94	2.11	657	3.84	2.78	657	4.17	3.18	657
Number of parcels possessed by wife solely	0.08	0.46	657	0.56	1.51	657	0.65	1.39	657
Area of land possessed by wife solely or jointly with spouse (hectares)	0.87	1.03	657	1.52	1.48	657	1.67	1.60	657
Area of land possessed by wife solely (hectares)	0.04	0.28	657	0.21	0.67	657	0.29	0.79	657
Treatment variables:									
Years since receiving first- or second-level certificate	1.76	1.27	657	6.66	2.91	657	13.21	3.68	657
Years since receiving second-level certificate	0.00	0.06	657	1.37	2.66	657	2.62	3.04	657
Control variables:									
Polygynous HH (%)	0.05	0.21	657	0.04	0.21	657	0.04	0.20	657
Region									
Amhara (%)	0.31	0.46	657	0.31	0.46	657	0.31	0.46	657
Oromia (%)	0.24	0.43	657	0.24	0.43	657	0.24	0.43	657
SNNP (%)	0.45	0.50	657	0.45	0.50	657	0.45	0.50	657
Age of HH head (years)	44.94	12.40	657	50.94	12.40	657	56.53	12.37	657
HH head is literate (%)	0.65	0.48	657	0.65	0.48	657	0.65	0.48	657
Number of children in household at baseline	3.28	1.96	657	3.28	1.96	657	3.28	1.96	657
Monthly real HH expenditures per capita (Birr)	194.21	165.19	657	1527.73	1203.44	657	5163.10	3,713.55	657
Number of working age males in HH	1.90	1.22	657	2.02	1.16	657	2.07	1.26	657
Distance from home to land administration office (km)	11.18	56.69	657	11.18	56.69	657	11.18	56.69	657
Past land redistribution in kebele (%)	1.00	0.00	657	0.96	0.21	657	0.98	0.15	657
Size of cash crop sector in kebele (ordinal measure)									
0	0.82	0.39	657	0.82	0.39	657	0.82	0.39	657
2	0.07	0.26	657	0.07	0.26	657	0.07	0.26	657
3	0.03	0.17	657	0.03	0.17	657	0.03	0.17	657
4	0.03	0.18	657	0.03	0.18	657	0.03	0.18	657
5	0.03	0.16	657	0.03	0.16	657	0.03	0.16	657
6	0.00	0.07	657	0.00	0.07	657	0.00	0.07	657
8	0.01	0.11	657	0.01	0.11	657	0.01	0.11	657

All percentages are presented on a scale of 0 to 1. For example, a binary variable with a mean of 0.01 represents 1%

IPV ANALYSIS

We test the hypothesis that land certification has a protective effect against wives' risk of experiencing different forms of IPV using two different approaches. Both approaches use data collected in 2021 using a survey module adapted from the tested module used in the DHS[36] that was administered to a randomly selected wife in each household. Both approaches estimate as outcomes the probability of experiencing any IPV in the 12 months prior to the survey, the probability of experiencing emotional IPV in the 12 months prior to the survey, and the probability of experiencing either physical or sexual IPV in the 12 months prior to the survey. We incorporated the DHS gender-based violence module into our survey, as well as additional questions to facilitate matching.

In the first approach we estimate the effect of second-level certification[37] on wives' probabilities of experiencing different forms of IPV using only the 2021 round of survey data.

The 2021 sample of ELTAP wives uses having a second-level land certificate as the treatment. Because only 30 wives had no certification, we do not use the ELTAP 2021 data by itself to examine associations between any certification and IPV.

In the ELTAP 2021 sample, as a base, we estimate the probability of each form of IPV separately, accounting for wives' individual characteristics, husband's characteristics, relational characteristics, and household characteristics summarized in Table 5.9.

The probability of each IPV outcome is given by

$$E(Y_i) = \frac{expexp\,(\Phi)}{1+expexp\,(\Phi)} \quad (1)$$

where Y_i is the binary IPV outcome for wife *i*. Φ represents the equation

$$\Phi = \alpha + \sum_{k=1}^{22} X_{ki}\beta_k + \varepsilon_i \qquad (2)$$

where X_{ki} is a matrix of characteristics of wives, husbands, relationships, and households described in Table 5.5. In the next model, we add whether the household received a land certificate to test if household-level certification, C_i , is protective (Equation 3) and later we add whether the wife's name is on the land certificate to test whether the wife having her name on the certificate, W_i , offers further protection (Equation 4).

[36] We incorporated the DHS gender-based violence module into our survey, as well as additional questions to facilitate matching. The DHS is tested to collect IPV data globally and has been applied in Ethiopia.
[37] For the 2021 survey data, we only consider impacts of second-level certification because using any certification as the treatment yielded a comparison group of only 30 women.

$$\Phi = \alpha + \sum_{k=1}^{22} X_{ki}\beta_k + \beta_{23}C_i + \varepsilon_i \quad (3)$$

$$\Phi = \alpha + \sum_{k=1}^{22} X_{ki}\beta_k + \beta_{23}C_i + \beta_{24}W_i + \varepsilon_i \quad (4)$$

The second approach addresses the problem of lacking a control sample when the treatment is defined as having any certification by leveraging the DHS data for Ethiopia from 2016 to create larger comparison groups using propensity score matching and entropy balancing. The DHS includes 16,650 households, with a sample of 15,683 women between 15 and 49 years. However, because the DHS does not distinguish between first-level and second-level certification, this second approach considers any certification (not specifically second-level).

To create the matched ELTAP/DHS sample, we start by identifying the best set of predictors of treatment using the ELTAP 2021 sample to iterate logistic regressions using all possible combinations of eight to fifteen predictors and choose the combination that maximizes the Akaike Information Criterion (AIC). Next, we use propensity score matching based on the optimal set of predictors to assign observations in the DHS and ELTAP samples to treatment groups defined as having any certification and having the name of the wife in their land certificate. To do this, we estimate propensity scores from a logistic regression model for the treatment group, and then match ELTAP 2021 observations to the five nearest neighbors in the DHS sample only for the data from households in Amhara, SSNP, and Oromia. Finally, we use entropy balancing on the full, matched sample to achieve balance with respect to the first and second moments of the distributions of the same optimal set of predictors. Entropy balancing improves upon matching methods by achieving balance on all specified covariates, without further eliminating observations from the sample (Hainmeuller 2011).

We estimate the average treatment effect on the treated (ATT) by

$$ATT = E[(Y_1 - Y_0)|D = 1] = E[Y_1|D = 1] - E[Y_0 \mid D = 1] \quad (5)$$

When using entropy balancing, the counterfactual term in the ATT is estimated by

$$E[Y_0 \mid D = 1] = \frac{\sum_{(i|D=0|)} Y_i w_i}{\sum_{(i|D=0|)} w_i} \quad (6)$$

where w_i is a unique entropy weight for each control observation.

Using the matched sample and using any certification instead of second-level, we then estimate each of the probabilities of wives experiencing any IPV, emotional IPV, and physical or sexual IPV similar to the first approach. We estimate a standard model for IPV. The probability of each IPV outcome is given by

$$E(Y_i) = \frac{expexp\,(\Phi)}{1+expexp\,(\Phi)} \quad (7)$$

where Y_i is the binary IPV outcome for wife *i*. Φ represents the equation

$$\Phi = \alpha + \sum_{k=1}^{22} X_{ki}\beta_k + \varepsilon_i \quad (8)$$

where X_{ki} is a matrix of characteristics of wives, husbands, relationships, and households described in Table 5.11.

We compare these results to models that also include land certification variables, which will estimate the average effect of treatment on the treated $E\,(Y_1 - Y_0 \backslash D=1) = E\,(Y_1=D1) - E(Y_0 \backslash D=1)$. The probability of each IPV outcome given treatment status is given by the equations

$$\Phi = \alpha + \sum_{k=1}^{22} X_{ki}\beta_k + \beta_{23}3C_i + \varepsilon_i \quad (9)$$

$$\Phi = \alpha + \sum_{k=1}^{22} X_{ki}\beta_k + \beta_{23}C_i + \beta_{24}W_i + \varepsilon_i \quad (10)$$

where C_i is a binary variable indicating the predicted treatment of whether wife *i*'s household has received a land certificate and W_i is a binary variable indicating the predicted treatment of whether wife *i* was explicitly included in the intervention by having her name on the land certificate.

Table 5. 9. Types of IPV Analysis, Datasets, and Variables

Dataset	Independent Variables	Dependent variables
ELTAP + DHS merged Only ELTAP	Wife's individual characteristics: Wife's age, wife's age at marriage with current partner, whether the wife is in a polygynous marriage, whether the wife is literate, whether the wife works off farm, index of the wife's level of decision-making power in household,[38] index expressing the wife's level of justification of physical violence.[39] Relational characteristics: Spousal age gap. Ownership of assets (not land): wife owns a house, wife has a title of ownership for a house, wife's name is on the title of ownership for a house, wealth index, household size of land owned, and number of large animals owned at the household level. Partner's characteristics: whether husband is literate, whether husband works off farm, whether husband helps with household chores, index with the number of the husband's controlling behaviors.[40] Region. Variable of interest 1: Wife lives in household with land certificate. Variable of interest 2: Wife name is in the land certificate	Experience of any IPV Experience of Emotional IPV Experience of Physical or Sexual IPV

THE ELTAP 2021 SAMPLE OF WIVES

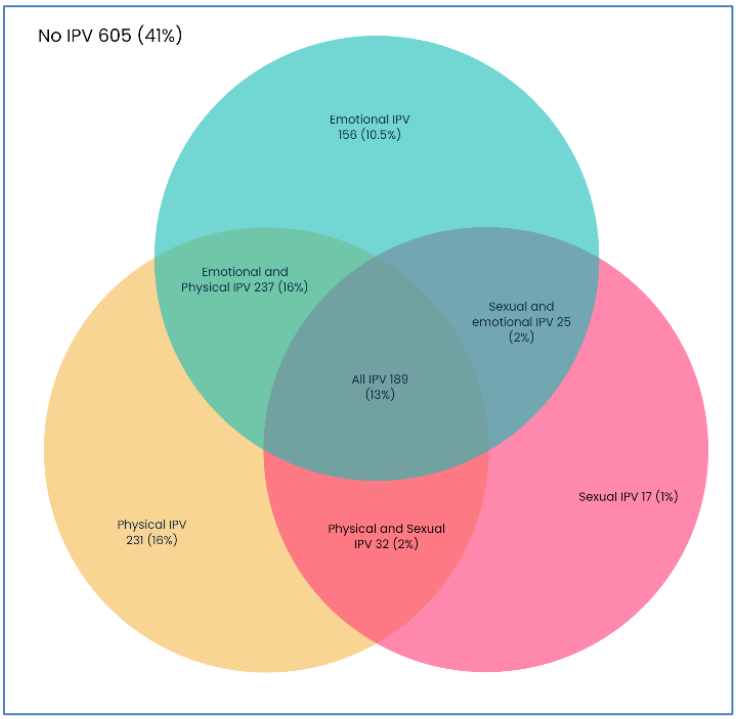
Figure 5.3 shows the prevalence of IPV and types of IPV among wives in the ELTAP sample. Forty-one percent of the 1,492 wives that responded to the IPV survey module declared not having experienced IPV. Table 5.10 shows descriptive statistics for the full sample and for subsamples of wives who experienced each form of IPV and wives who did not experience IPV.

[38] Specifically, the questions used are "Who usually decides how the money you earn will be used?, Who usually decides how your husband's earnings will be used?, Who usually makes decisions about health care for yourself?, Who usually makes decisions about making major household purchases? And Who usually makes decisions about visits to your family or relatives? With pre-coded answers: 1) Respondent, 2) Spouse, 3) Respondent and spouse jointly, 4) Other household member and, 5) Other.

[39] The Index was created using the following questions copied from the DHS module (DHS 2014) for gender-based violence: Question: "In your opinion, is a husband justified in hitting or beating his wife in the following situations: If she goes out without telling him?; If she neglects the children?; If she argues with him?; If she refuses to have sex with him?; If she burns the food? With answers, "I agree, I disagree, I do not know. Any "I agree" was given value 1 and added in an index that goes from 0 -1. For this index, the index of controlling behaviors, the application created a score for every observation for which there is a response to at least one item. These scores are added and then divided by the number of items over which the sum is calculated. Final scores range from 0 to 1.

[40] This is based on a question that asks "Please, tell us if any of these sentences describes your relationship with your spouse/husband? He is jealous or angry if you (talk/talked) to other men?, He frequently accuses you of being unfaithful?, He does not permit you to meet your female friends?, He tries to limit your contact with your family?, He insists on knowing where you (are/were) at all times? With answers "yes, no, I do not know"

Figure 5. 3. Number of Women Reporting Forms of IPV in the ELTAP Wives Survey, 2021



Source: Elaborated by the author

Across the subsamples of wives, there is little difference in wives' literacy, husband's literacy, whether wives work off-farm, and whether households have a land certificate. Wives in polygynous marriages are over-represented among wives who experienced each form of IPV. Wives who experienced each of the different forms of IPV were slightly more likely to have husbands who engaged in off-farm work and about half as likely to have husbands who do household chores.

Ninety-one percent of the wives in the full sample reported owning a home. Wives that possessed titled houses are half the full sample and 44 percent among women who did not experience IPV. Two-thirds of wives lived in households that have a second-level land certificate but just over half the wives have their name on the certificate. These percentages were similar across wives who did and did not experience violence and each of the different forms of violence.

Table 5. 10. Wives in ELTAP Sample. Percent by Any IPV, Emotional, and Physical and Sexual IPV

Type of IPV	No IPV	Any IPV	Emotional IPV	Physical and Sexual IPV	Full Sample
Type of Household					
- Monogamous	96%	90%	91%	90%	93%
- Polygynous	4%	10%	9%	10%	7%
Literacy					
- Wife is literate	75%	77%	79%	77%	76%
- Husband is literate	63%	60%	59%	61%	61%
Off Farm Work					
- Wife works off-farm	68%	68%	65%	69%	68%
- Husband works off-farm	77%	84%	82%	84%	81%
Wife owns a house	88%	94%	94%	94%	91%
Wife has a title to a house	44%	53%	57%	55%	50%
Wife's name is on the house title	52%	43%	39%	41%	47%
Husband helps with chores	47%	27%	24%	27%	35%
Wife's household has a second-level land certificate	67%	34%	70%	66%	66%
Wife's name is name on second-level land certificate	53%	47%	54%	53%	53%
Number of Wives	**605**	**887**	**607**	**731**	**1,492**

Table 5.11 shows the descriptive statistics of additional control variables by whether wives did or did not experience each form of violence and for the full sample. There are not substantial differences among the wives in terms of their ages, husband's age, age gap, age at first cohabitation, the index of wife's participation in decision making, number of large animals owned, and area of land owned. However, there are variations in the indices for justification of violence, controlling behaviors, and wealth. Wives who experienced physical or sexual IPV saw more justification for violence and experienced more controlling behaviors by their husbands than wives who did not experience physical or sexual violence. Wives who experienced emotional IPV also experienced more controlling behaviors by their husbands than wives who did not experience emotional violence. These differences carried over into higher indices of justification for violence and experience of controlling behaviors for wives who experienced any form of IPV compared to wives who did not experience IPV.

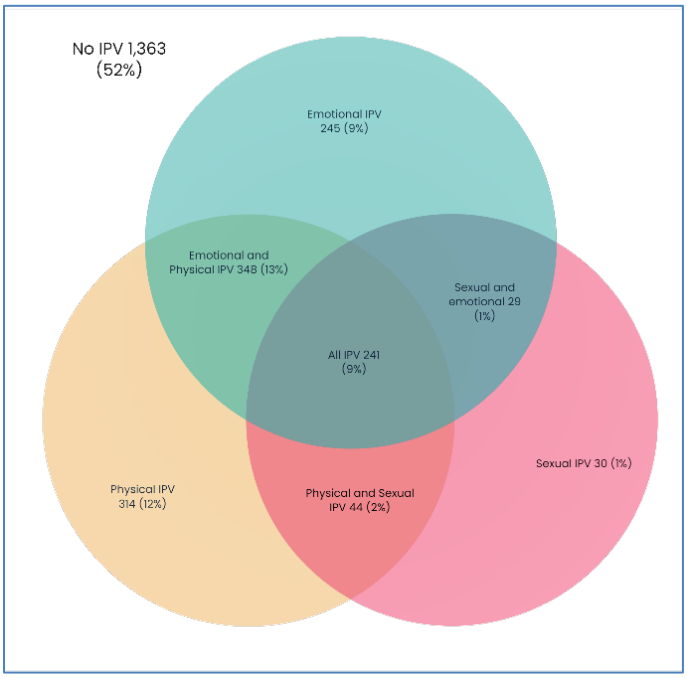
Table 5. 11. Wife, Husband, and Household Characteristics by Experience of Violence

	IPV				Emotional IPV				Physical and Sexual IPV combined					
	No IPV		Any IPV		Emotional IPV		No Emotional IPV		Physical and Sexual IPV combined		No Physical and Sexual IPV combined		Full sample	
Variables	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Husband's age	45	11	46	11	46	11	46	11	46	11	45	11	46	11
Wife's Age	55	13	56	13	56	13	56	13	56	13	56	13	56	13
Age gap	10	8	10	8	10	8	10	8	10	8	10	8	10	8
Age at first cohabitation	19	6	19	5	19	5	19	6	19	5	19	6	19	5
Index of wife's decision-making	0.8064	0.2969	0.8067	0.2594	0.7972	0.2521	0.8142	0.2884	0.7995	0.2641	0.8134	0.2854	0.8066	0.2751
Index of wife's justification of violence	0.2279	0.3236	0.326	0.354	0.2809	0.3412	0.2874	0.3486	0.3592	0.3555	0.2161	0.32	0.2862	0.3453
Index of husband's controlling behaviors	0.1246	0.1916	0.2329	0.2885	0.2832	0.308	0.1238	0.1947	0.248	0.2969	0.1323	0.2011	0.189	0.2591
Household wealth index	0.0356	0.9894	0.0076	0.9894	0.008	0.9891	0.0156	0.9777	0.0034	0.9956	0.034	0.9503	0.019	0.9725
Number of large animals HH owns	4.6909	3.6898	4.5874	4.2172	4.6787	4.4888	4.5733	3.6464	4.539	4.1762	4.7162	3.8458	4.6294	4.0107
Area of land owned	1.5048	3.7487	1.4534	1.553	1.6297	1.7134	1.3853	3.2079	1.45	1.5965	1.4977	3.4021	1.4747	2.6894

THE ELTAP/DHS SAMPLE

Figure 5.4 shows the prevalence of IPV by types of IPV in the sample of 2,614 wives. This sample results from the matching of ELTAP wives and DHS women of similar characteristics using PSM methods described in the methods section of this report.

Figure 5. 4. Number of Women Reporting Forms of IPV in the ELTAP Wives Survey, 2021+DHS Sample after PSM



Source: Elaborated by the author

Tables 5.12 and 5.13 show notable differences across subsamples of wives who experienced each form of IPV and wives who did not experience IPV. Wives in polygynous marriages are over-represented among wives who experienced each form of IPV. Compared to wives who did not experience IPV, wives who experienced each of the different forms of IPV were more likely to be literate, work off-farm, own a house, and live in a household that has a land certificate; they are less likely to have their own names on a land certificate and to have a husband who does household chores. Eighty-nine percent of the wives in the full sample reported owning a home. Forty-six percent of women have a title for their house and 41 percent have their name on the title.

Table 5. 12. Wives in ELTAP DHS Matched Sample. Percent by Any IPV, Emotional IPV, Physical and Sexual IPV

Type of IPV	No IPV	Any IPV	Emotional IPV	Physical and Sexual IPV	Full Sample
Type of Household					
- Monogamous	93%	87%	87%	87%	90%
- Polygynous	7%	13%	13%	13%	10%
Literacy					
- Wife is literate	44%	58%	58%	59%	51%
- Husband is literate	49%	53%	51%	55%	51%
Off Farm Work					
- Wife works off farm	47%	58%	54%	60%	52%
- Husband works off farm	90%	88%	88%	88%	89%
Wife owns a house	81%	87%	86%	88%	84%
Wife has a house title	46%	46%	44%	45%	46%
Wife's name is on the house title	42%	41%	38%	40%	41%
Husband helps with chores	45%	28%	25%	28%	40%
Region					
- Amhara	38%	37%	29%	40%	37%
- Oromia	27%	31%	32%	28%	29%
- SNNP	35%	32%	38%	32%	34%
Wife in household with certificate	65%	79%	78%	80%	72%
Wife with name on land certificate	49%	39%	42%	38%	44%
Total number of women (wives) Included	1,363	1,251	863	1006	2614

Table 5. 13. Wife, Husband, and Household Characteristics by Experience of Violence, Emotional IPV and, Physical and Sexual IPV, ELTAP + DHS Matched Sample of 2,614 women.

	IPV				Emotional IPV				Physical and Sexual IPV combined					
	No IPV		Any IPV		Emotional IPV		No Emotional IPV		Physical & Sexual IPV		No Physical & Sexual IPV		Full sample	
Variables	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Husband's age	37	12	41	12	41	12	38	12	41	12	37	12	39	12
Wife's Age	47	15	51	15	50	14	47	15	51	15	47	15	48	15
Age gap	9	9	10	9	10	9	9	9	9	9	9	9	9	9
Age at first cohabitation	18	5	18	4	18	5	18	5	18	4	18	5	18	5
Index of Wife's decision-making	0.720	0.295	0.742	0.293	0.730	0.293	0.731	0.294	0.736	0.297	0.727	0.292	0.731	0.294
Index of wife's justification of violence	0.390	0.394	0.395	0.384	0.367	0.390	0.405	0.389	0.417	0.381	0.377	0.394	0.392	0.390
Index of husband's controlling behaviors	0.143	0.198	0.264	0.303	0.3167	0.322	0.144	0.201	0.275	0.308	0.155	0.214	0.201	0.261
Household wealth index	0.007	0.973	-0.002	0.990	-0.023	0.983	0.004	0.980	0.012	1.000	0.015	0.969	-0.004	0.981
Number of large animals HH owns	4.216	3.398	4.201	3.624	4.189	3.724	4.218	3.396	4.242	3.638	4.187	3.427	4.208	3.507
Area of land owned	6.558	8.946	4.536	7.241	4.842	7.320	5.959	8.628	4.494	7.238	6.276	8.734	5.590	8.235

QUALITATIVE ANALYSIS

EconInsights used FGDs to gather data for details of the perspectives of the participants on the main benefits and limitations of their, or others' having land certificates. The FGDs use the most significant change (MSC) technique which allows researchers to collect stories that identify and explain what participants perceive as the most significant changes (Davis and Dart 2003) that took place in their lives and their communities since certification.

Facilitators engaged participants in discussions about the most recent certification processes they had observed as well as the main effects of certification. Facilitators showed pictures of women and men receiving credit, engaged in land disputes, renting land in and out, investing in agricultural inputs, water and soil conservation, and making decisions about land and participating in their communities. The facilitators used these pictures to ask participants to think about the impacts of the land certification process on the lives of beneficiaries. For each outcome, the facilitator asked participants if they had witnessed any changes related to each specific outcome in their village, followed by whether they considered that such changes were applicable to all people in their village, or to some specific people, probing for differences in gender, age, socioeconomic status, and ethnicity.

The data collectors transcribed data from FGDs, translated them and coded their transcripts utilizing a set of codes prepared to capture the main outcomes of the study. We used Atlas Ti to analyze the coded transcripts grouping citations related to each code into families that reflected the families of outcomes (credit, dispute resolution, renting, investments on agricultural inputs and SWC, tenure security, women's empowerment, and IPV) and families of codes related to land certification processes and women's participation in decision-making. Landesa's FGD supervisor produced the analysis tables to identify patterns and differences between responses from women and men in general, and later between women and men in each region. The discussion section integrates qualitative findings into the interpretation of quantitative results.

CHARACTERISTICS OF THE *KEBELES* IN 2021

Kebele characteristics summarized in Table 5.14 reflect the descriptions of livelihoods, land use, land scarcity, and migration for rural Ethiopia discussed in Section III. Agriculture is the predominant land use and livelihoods. Fourteen percent of *kebele*s have no remaining bush land and 83 percent have fewer than 25 percent *kebele* land area left as bush land for potential agricultural expansion, which still may not be sufficiently suitable for crop cultivation. Besides agriculture, small-scale trade and casual labor are the primary livelihoods of *kebele* residents. There is migration in and out of *kebeles*, with slightly more than half of *kebeles* reporting net outmigration. Although the survey of *kebele* authorities did not ask to where people migrated, this is consistent with increasing rural to urban migration. There is limited presence of financial institutions within *kebeles,* with only 4 percent having formal banks and 39 percent having microfinance institutions. *Kebele* residents face some barriers to access to services available outside the *kebele*, with at least one-fourth of *kebeles* not having passable roads year-round and the substantial cost of public transportation to the *woreda* capital, approximately 10 percent of daily household per capita expenditures.

When asked if they had heard of various land certification projects in their *kebele*, authorities in only 12 percent of *kebeles* had heard of either ELTAP or ELAP and 29 percent had heard of LIFT; in approximately 60 percent of *kebeles*, authorities had not heard of any land certification projects by name. Nonetheless, their awareness of and reported prevalence of first- and second-level certification activities in their *kebeles* were high, with nearly all reporting first-level certification, 94 percent reporting second-level certification activities, 84 percent reporting second-level land certificates were issued, and 80 percent reporting that their *kebele* held public meetings for land registration.

Table 5. 14. *Kebele* Characteristics as Reported by *Kebele* Authorities

Kebele characteristics	Mean or Percentage	Std. Dev. (for means)
Population		
Total number of households in *kebele*	1,072	885
Percentage of *kebeles* in which in the last 5 years …		
More people moved in	39%	
More people moved out	56%	
About the same of both / Neither arrivals nor departures	5%	
***Kebele* land use**		
Kebeles in which the most common land use is farming	95%	
Kebeles in which the percentage of land that is bush is		
None	14%	
1-24%	83%	
25-49%	2%	
50-99%	2%	
***Kebele* livelihoods**		
Kebeles where at least 75% of the population is employed in farming	84%	
Percentage of *kebeles* where _____ is one of the Main Economic Activities		
Farming	99%	
Small Trade	72%	
Sand/Stone Sale	10%	
Casual/Daily worker	35%	
Other	27%	
***Kebele* services**		
Kebele's main road is passable all year	72%	
Kebele has a large market weekly	77%	
Kebele has cell/mobile coverage	92%	
Kebele has a bank	4%	
Kebele has a microfinance institution	39%	
Kebele had a soil and water conservation project, 2016-2021	10%	
Total cost in BIRR from kebele to the *woreda* capital via public transportation	20.33	20.66
Kilometers by road to the nearest major urban center from the *kebele* center	23.01	24.22
Number of churches in *kebele*	4.36	4.24
Number of mosques in *kebele*	2.56	3.81

Note: Means and percentages are for all 183 *kebeles*

VI. RESULTS

In this section we present the results of the DID, CT, and IPV analysis organized by family of outcomes. The DID results replicate the Cloudburst analysis to show a treatment effect of second-level certification. The intervention group is comprised of households that received second-level certification or had plots that were surveyed but did not receive the second-level certificate; the comparison group is comprised of households that either did not receive certification or received only first-level certification. The CT analysis aims to show the effect of years of certification. In the CT analysis we consider households to have received second-level certification only if they received the second-level certificates. We also analyze the effects of years of having "any" certificate, whether first-level or second-level. We caution readers the three treatments are different.

We encourage readers to interpret the DID and CT results as complementary. The two approaches vary in how impact is calculated and in the definition of treatment. The DID shows the change in time between baseline and follow-on and between the treatment (households with second-level certificate or at least second-level survey) and the comparison group (households without certificate or with first-level certificate). The CT shows the effect for each year since households received certificates.[41] We analyze this for two treatments: for households with second-level certificates and for households with either first- or second-level certificates.

We also caution readers who may want to compare the 2021 results against the results presented in the Cloudburst ELTAP ELAP endline report (2016). Despite using the same definition of treatment and comparison groups, the samples in each report are different. Namely, the 2021 dataset does not include Tigray and 12 *kebeles* in the Amhara region or the ELAP sample. In addition, many households moved from the comparison to the treatment group between 2015 and 2021. Specifically, 1,280 households (56 percent of the DID endline sample) were surveyed for or received second-level certificates by 2015 and 1,799 households (80 percent of the DID follow-on sample) were surveyed for or received second-level certificates by 2021. Therefore, we advise comparing results with caution.

CREDIT OUTCOMES (HYPOTHESIS 1)

Hypothesis 1: Certification increases women's and men's use of credit

Key findings: Only 67 households in 2015 and 32 households in 2021 accessed credit through a land certificate. The small sample size suggests negligible impact of certification on credit access. Given the small sample size we are cautious to draw conclusions with respect to the impact of certification. The CT estimates suggest that any certification and second-level certification specifically may increase the likelihood that households will take out credit using a land certificate to help secure the loan. Having any certificate may increase the probability of taking out credit using land as collateral over time. However, for households with second-level certificates, the likelihood of obtaining credit may increase until peaking 5 to 6 years after receiving the second-level certificate and then decreases. This pattern appears to be driven by D/MHH.

[41] Results tables 6.1-6.8 show the effect of years and years.^{2} Years ^{2} is included to test the quadratic relationship between years of treatment and the outcomes of interest.

Table 6.1 summarizes impacts of certification on credit from the DID and CT analysis.

Table 6. 1. Summary of DID and CT Results on the Effects of Certification on Access to Credit

Continuous Treatment (Effect w/each year of certification)							DID (Average Treatment Effect, Total Sample)
	Any certificate			Second-Level Certificate			
Amount of credit taken for farming in past year (log Birr)							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	Not analyzed using CT						0.005
Years²							
HH took any credit for farming in past year							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	Not analyzed using CT						-0.002
Years²							
HH formally or informally used land as collateral to obtain credit							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	0.002	-0.001	0.002	**0.011****	0.008	**0.012*****	0.042
Years²	**-0.000****	-0.000	-0.000	**-0.001*****	-0.001	**-0.001*****	
Amount of credit taken using land certificate, conditional on taking credit using certificate (log Birr)							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	**-0.020***	**-0.200*****	**-0.021****	0.036		-0.002	Not analyzed using DID
Years²	**0.003***	-0.000	**0.003****	-0.004	-0.000	0.000	

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

To be comparable with Cloudburst's DID analysis over 2008-2015, we measured the treatment effect of second-level certification on the same variables of whether the household used the land certificate to take any credit for farming purposes in the year before the survey and the amount of credit taken as ln(Birr+1). However, we only use data from the 2021 and 2015 surveys, which collected information about credit in the same way. In 2015 and 2021, the surveys ask the respondent to enumerate their plots and, for each plot, to list up to three of the most important crops in terms of livelihood benefits. The surveys collect information on the amount of credit taken for farming purposes on each parcel for each crop. In 2008, the survey asked the amount of credit taken for farming purposes for the household

as a unit. This change in the unit of observation limits our ability to compare the data collected in 2021 with the data from 2008 for the credit questions. We also limit the DID analysis to the subsample of households that had not yet been surveyed for or received second-level certificates by the 2015 survey. In the DID analysis we used the same variables that Cloudburst used in the 2016 report and did not find significant effects on any of the credit variables. In the CT analysis, we instead analyzed the effects of the years of having any and second-level certification on the probability of households taking credit for any purpose using their land certificates to help secure credit and the amount of such loan(s) *conditional on taking out credit.*

Unlike Cloudburst's results from 2008 to 2015 which found positive effects of second-level certification on credit for farming and negative effects on using land as collateral, we do not find statistically significant results on any credit outcomes using the DID analysis on the period from 2015 to 2021. One potential explanation for the difference in results is that households may have used credit in the few years right after they received their certificates but later reduced their demand for credit (as the results of the CT analysis of suggest). Another reason may be changes in credit availability over time. The only statistically significant heterogeneous effect in our DID analysis for 2015 to 2021 suggests that the aging of our panel sample may be another reason for different results between the two evaluations. Households with older heads were less likely to take credit for farming. For each year of the head's age, the probability reduced by 0.1 percentage points, a small effect size but notable given the low rates of credit access (15 households, or 1.5 percent, took credit for farming purposes at endline in 2021), and average age of all heads, either male or female, was 46 years. Balana et al.'s (2020) survey of 4 *woredas* found that loan seekers are on average younger and more likely to be male heads of households, while FHHs, households with older heads and low-income households had more difficulties to access credit (Balana et al., 2020).

The CT analysis over 2015 to 2021 show that households that received a second-level certificate are statistically significantly more likely to take out credit over time. However, the increase in probability is 3 percentage points at its peak approximately 5 years after receiving the second-level certificate and disappears around year 11. In absolute terms, these impacts are substantial given the overall low rates of credit use of 2 to 3 percent in the CT sample over 2008 to 2021. In 2021, over 93 percent of the households with credit were households that had received second-level certificates. Figure 6.1 shows the effects of second-level certification and any certification on a household's likelihood of obtaining credit. Figure 6.2 shows the effects of second-level certification and any certification on the same likelihood for FHH and D/MHH. The effect of any certification on the amount of credit taken out is initially negative but becomes positive 7 years after receiving any certificate and continues to increase each year after that. Because of the small sample sizes, we cannot disaggregate the effects based on the duration of the loan and caution against interpreting results as causal effects or comparing across FHH and D/MHH.

Figure 6. 1. Impact of Certification in Using Land to Obtain Credit by Certificate Type

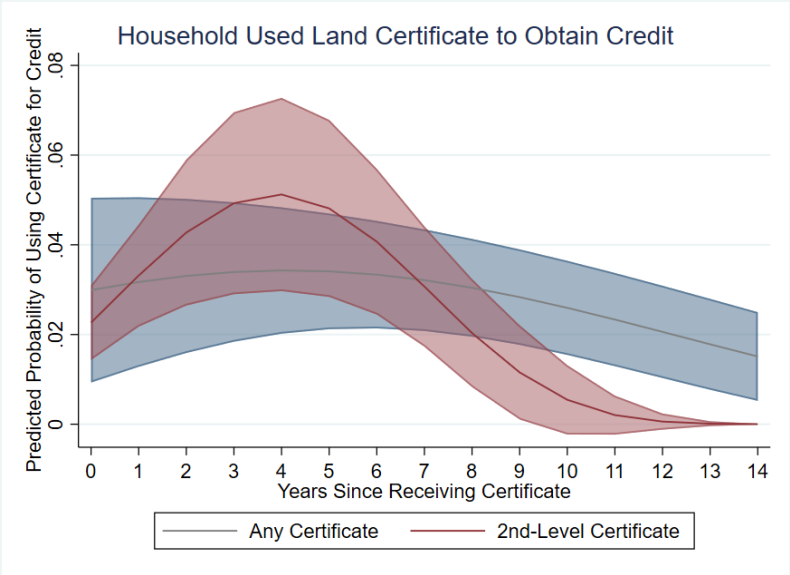
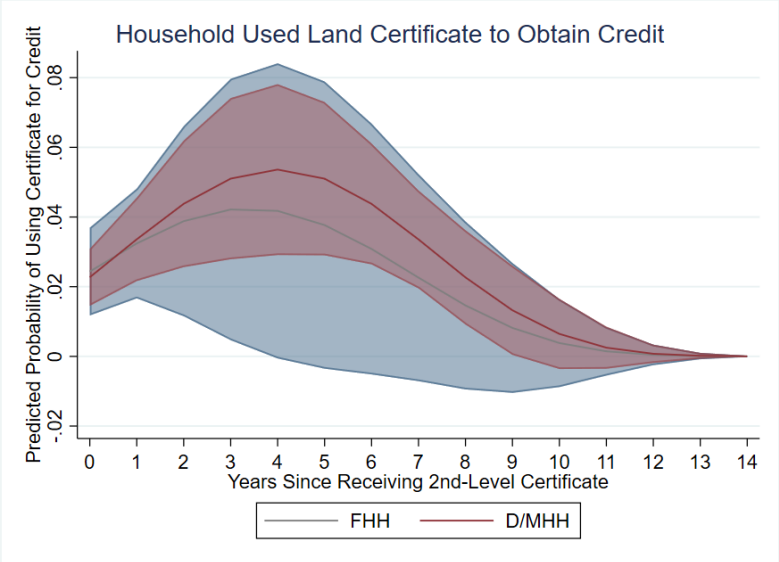


Figure 6. 2. Impact of Second-level Certification on Using Land to Obtain Credit by Gender of Head of Household



Limited supply of credit for farmers may be dampening potential impacts of certification. Rural financial markets in Ethiopia are still underdeveloped and much of the population is still underserved (Demirguc-Kunt, A., et al, 2015). Since 1991, the GoE put into place measures to liberalize the financial sector. For example, Proclamation No. 84/94 allows private domestic investors to participate in banking and insurance activities. Proclamation No. 40/96 allows microfinance institutions in Ethiopia. Alemayehu (2020) cites the Licensing and Supervision of Microfinance Institution Proclamation No. 40/1996 to explain how this law authorized the functioning of microfinance institutions (MFIs) to legally accept deposits from the public, to draw and accept drafts, and to give loans. However, this sector has not increased its depth as in other African countries in the rural sector. Our *kebele* surveys reveal that only 4 percent of *kebeles* have branches of banks in the *kebele* and 39 percent of the *kebeles* have branches of microfinance institutions. The distribution is similar in the three regions. To add to the constrains on the supply side, there are still limitations on the loan size and lending methodologies with financial products limited to saving deposits and lending predominantly through microfinance institutions that use group lending as a main methodology (Abera and Asfaw, 2019). More importantly, the use of land as a collateral is still limited. The National Bank of Ethiopia issued a guideline allowing banks to use land certificates as a collateral, but the federal land law has not yet allowed this. Only the Amhara land proclamation allows using land as a collateral for credit.

Women and men in the qualitative FGDs affirm that there is a supply of formal credit, mostly through microfinance institutions (three regional microfinance institutions, namely Amhara Credit and Saving Institution, Oromia Credit and Saving Institution and Omo Credit and Saving Institutions in SNNP). Findings from the FGDs suggest that there is a perception that the certificates are instruments for obtaining formal credit from microfinance organizations, although not banks necessarily. Farmers in FGDs in Amhara and Oromia noted that they could not get credit from banks or had even approached a bank with their certificate and had been denied credit. Microfinance organizations offer farmers the possibility of either accessing loans individually or in groups. Having this flexibility seems to be attractive to farmers:

> "The Amhara Credit and Saving Institution has two types of arrangements to provide them [farmers] with loan service: either by forming groups and access loan in group or to individuals by having their farmland certificate as a mortgage. So, if we can provide land certificate as a mortgage, we can access more amount of loan than accessing loan in group. We wish other loan institutions and banks follow this approach too." (FDG 1 Men)

In addition to the limited supply of credit, demand side factors among farmers may also curtail potential impacts of certification (Abate et al. 2016, Khander and Koolwal, 2016, Balana et al, 2020). The ability to use land as collateral only solves one type of problem that affects the demand. Even after removing this constraint, other demand side factors such as the farmer's perception that costs are too high, or the lack of information about how to access credit, or risk aversion may still affect the farmers' interest in accessing a loan. In addition, limited availability of credit providers or credit products that are suitable for rural clients and high costs of borrowing can be factors that limit credit from the supply side. Some participants also qualified their statements about how certificates may increase a farmer's ability to access credit by acknowledging their own concerns against taking credit. Muslim participants discussed how the Shariah law does not allow credit; other participants discussed the high interest rates and risks

that repaying a loan may bring to low-income farmers that have low productivity, such as themselves. Other participants discussed their discomfort with forming groups to take loans, which is often a requirement by microfinance institutions. Informal sources were reported to be the most accessible, compared to formal sources, for loans for both the younger and older ages. In both cases, the "Equb" and other traditional social support groups are being used to access informal credit.

A separate issue that affects the supply and demand is related to the gender of the borrower. Our quantitative results suggest that FHHs are not leveraging their second-level certificates to access credit. Although women in FGDs reported using their land certificates to take loans, women preferred informal credit sources including relatives or women organizations for their greater flexibility in terms of repayment. As Bizoza and Opio-Omoding (2021) and other evaluations have suggested, the GoE may consider improving the enabling environment for the development of a financial market with credit suppliers that develop financial products tailored to the needs and characteristics of most small farmers, including women, who are not necessarily seen as the typical farmer in Ethiopia because of social norms. The study of Balana et al (2020) in Ethiopia also finds that women tend to be less likely than men to be given loans by banks and MFIs. Evaluations of the LIFT program found that people were more likely to know they could use their second-level certificate to access credit in areas where LIFT had complementary programs with MFIs to develop loan products that leveraged certificates and had more accessible terms for farmers than in areas without complementary programming (Holden and Neumann 2021). The study does not disaggregate this awareness by gender. Evaluations of LIFT suggest that women have demand for credit linked to second-level certificates; however, how to meet that demand remains unclear. Despite women being 34 percent of LIFT loan recipients, women received only 3 percent of the total amount of loans given by their program up to August 2019 (LIFT 2019).

CONFLICT RESOLUTION FAMILY OF OUTCOMES

Hypothesis 2: Certification reduces the number of household-level land-related disputes and dispute resolution time

Key findings: FGD participants perceive that land certification reduces the likelihood of experiencing disputes. However, among households, there were only statistically significant impacts on the probability of experiencing a dispute found for second-level certification in the DID analysis among households with larger landholdings (an average reduction of 2.9 percentage points per hectare) and among households farther away from regional capitals. This suggests that years after they were issued, either the certification process or the certificates themselves still serve to clarify and confirm boundaries or that investments in improving land administration in remote areas are having an effect. Among wives, DID results show that a household being surveyed for or receiving second-level certification increased a wife's probability of experiencing a boundary dispute by 1.4 percentage points from 2008 to 2021.

Certification reduces dispute resolution time, and more so for FHHs. Figures 6.3 and 6.4 illustrate the effects over time of having a certificate on the time involved in resolving a land dispute. The reduction in the amount of time is approximately 5 days, after one year of having any certificate. The amount of time to resolve disputes continues to decline until 16 years after receiving any certificate, when dispute time has decreased by more than 23 days. Dispute resolution time decreases more rapidly with any certification among FHHs to more than 19

fewer days approximately 9 years after receiving any certificate, at which point the effect size begins to decrease. Among D/MHHs, any certificate reduces dispute time by over 23 days 17 years after receiving a certificate. Second-level certification even more dramatically reduces dispute time by almost one month 14 years after FHHs receive a certificate.

We examine the effect of certification on whether household members experienced boundary disputes in the 24 months prior to the survey, the amount of time (in logged months plus one) to solve disputes, and whether wives experienced boundary disputes on land they own by themselves. As in the case of the 2016 report (Cloudburst 2016), we found that land disputes were relatively uncommon in the data (for example, 162 out of 2,269 households in the DID sample in 2008 and 74 out of 2,257 households in 2021 reported experiencing a land dispute) and so interpret the results with caution.

Table 6.2 presents the DID and CT results for the conflict resolution family of outcomes.

Table 6. 2. Summary of DID and CT Results on the Effect of Certification on Conflict Resolution

	Continuous Treatment (Effect w/each year of certification)						DID (Average Treatment Effect, Total Sample)
	Any certificate			Second-Level Certificate			
Amount of time to resolve land dispute (log months)							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	**-0.191*****	**-0.231*****	**-0.139***	-0.138	**-0.287****	-0.174	0.500
Years²	**0.006****	**0.013*****	0.003	-0.004	-0.006	-0.000	
HH experienced land disputes related to boundaries or encroachment							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	0.005	0.004	0.005	-0.002	-0.004	-0.000	0.008
Years²	-0.000	-0.000	-0.000	0.000	0.000	0.000	
Wives experienced land disputes related to boundaries or encroachment							
	All wives			*All wives*			
Years	0.002			0.001			**0.014***
Years²	0.000			-0.000			

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Figure 6. 3. Impact of Second-level Certification on Dispute Resolution Time

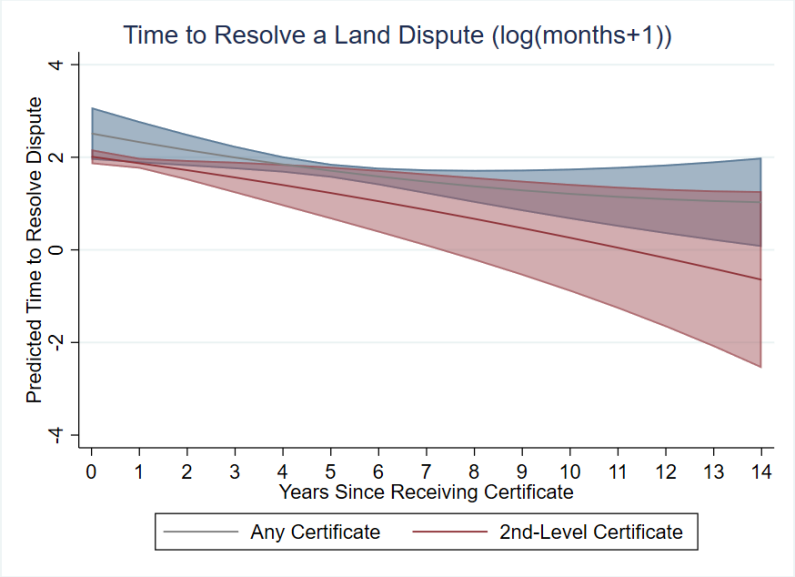
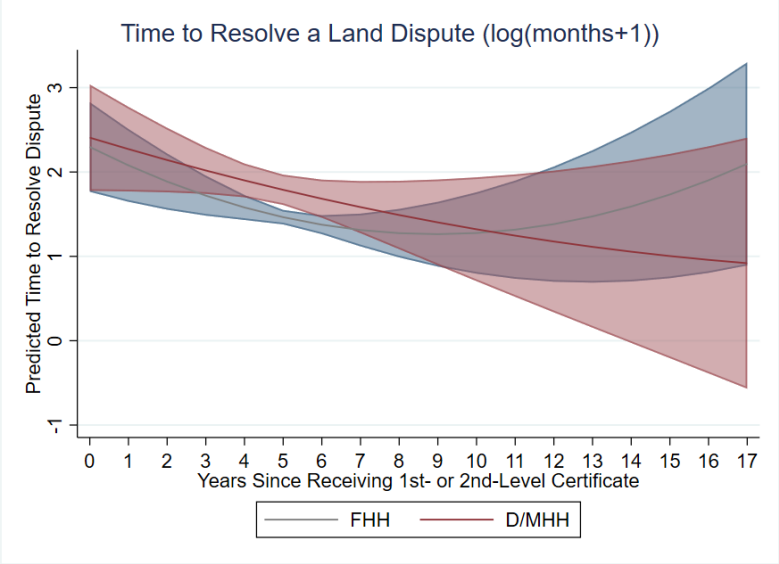


Figure 6. 4. Impacts of Any Certification on Dispute Resolution Time by Gender of Head of Household



Our DID analysis aligns with the 2016 Cloudburst evaluation of the ELTAP/ELAP programs that found little statistically significant evidence of impact of second-level certification or surveying relative to first-level or no certification (Cloudburst 2016). Our qualitative evidence aligns with findings from other research that land registration and certification in general (not restricted to second-level) reduced the number of land disputes, including conflicts arising from border and inheritance disputes in Ethiopia (Giri 2010, Holden and Tefera 2008, Holden et al. 2011, Holden and Neumann 2021). Evaluations of LIFT also suggest that much of the reduction in disputes happened during the certification process as boundaries and claims were clarified and that having certificates helped avoid disputes (LIFT 2020, Holden and Neumann 2021). This was also the experience under ELTAP and ELAP. Well-adjudicated areas during

first-level certification had fewer disputes during second-level certification. Sixty-five percent of surveyed LIFT participants noted a general reduction in the number of disputes since the program began (Holden and Neumann 2021).

The increase of the probability of wives experiencing conflicts is notable given that no wives in the control group reported boundary disputes at baseline and only 12 wives in treatment group D reported boundary disputes at baseline. These effects were not observable in the Cloudburst IE over a shorter timeframe. These results may be related to two issues in the analysis. First, over time, the number of wives with land increases in control and treatment groups between 2008 and 2021. As more wives have land, they may experience more conflicts. Second, the observed increase in wives' probability of experiencing conflict may reflect conflicts during the certification process for land possessed by wives. Relatedly, LIFT and other USAID funded projects have illustrated how women may be at risk of GBV during land certification processes given the discussions that likely take place within their households about their right to have their name on the certificates, and problems with borders (Mekonen et al. 2019).

Qualitative data from the FGDs supports the hypothesis that certificates have improved land dispute outcomes. Participants in our FGDs across the three regions stated that land certification has helped reduce and resolve border disputes, since the certificates are used as evidence for the court, the land administration office, or other alternative bodies to mediate the disputes. In some FGDs, participants identified conflict resolution as the most significant, or important effect of land certification.

> Resp 1: "[Certificates have] a positive change as they can assure their right. Previously, we were suffering from frequent conflicts related to land tenure." (FGD Men 1)
>
> Resp 2: "Now whenever conflict happens around land tenure owners can provide their certificate as an evidence and resolve the conflict (more) easily than the previous times." (FGD Men 1)

Participants also noted the accompanying maps are helpful in resolving border disputes, which, as illustrated in the example below, can also affect renters.

> "My mother used to practice sharecropping with some other person who plow part of her farmland. There was a certain size of the land left unused, and neighboring farmers started claiming the unused land and dared plowing it without her will. Since there was no map for the land and as she is female, she had to pass through various such challenges and quarrels […] Now the problem has got an end when the certificate and map have been provided to landowners. Now, such challenges remained to be only history. If it occurs again community leaders would easily mediate and solve." (FGD 2).

FGDs in all regions reflected that the certificates may have helped the resolution of conflicts experienced particularly by women. In most FDGs, participants discussed that certificates helped to avoid conflicts over land after divorce because they serve to clarify ownership. Participants pointed to the fact that having the name and photograph of both the husband and the wife on the land certificate

has made it straightforward for a woman to prove her claim to half of the certified land in the event of divorce.

The FGDs also suggest that the link between having second-level certificates and reducing disputes is not straightforward. Caveats occur when there are large power differentials between the two sides of the dispute. Some participants mentioned land related corruption in all the three regions associated with (i) closeness between the mediator and one of the disputants; (ii) interest in land by investors who want to acquire large portions of land; or (iii) in the case of expropriation for urban development. Comparing the FGD in the three regions, we find that in all the regions disputes around rented land are perceived as minimal. In one FGD in Amhara, participants reported rental disputes that were solved in court with the help of the certificate and clarification about the law. Participants in the other two regions reported that disputes related to rental contracts have significantly declined due to the land certification. During ELAP and ELTAP, reports from the field about rental disputes were less concerned about the terms of the rental agreement, and more concerned that people, particularly relatives of a widow's husband, would claim land they had rented for 2 or 3 years as their family land and outmaneuver the widow in litigation over the ownership by producing false, paid-for witnesses and manipulating the dispute resolution process to their advantage. This is consistent with reports from LIFT and current reports from the LGA project. Possession of land certificates mitigates against such false claims.

> Resp 3: "Along with its benefits, there are some problems occurring due to some dishonest committee members. Some committee members are still trying to steal somebodies' certificate and provide it to another person. So, such lies, and misconducts are still affecting landowners negatively. As I have seen in my eyes, problems of biasness and double certification is still observed." (FGD Men 1)

LAND RENTAL ACTIVITY FAMILY OF OUTCOMES

Hypothesis 3: Certification increases the likelihood that men and women engage in land rental and sharecropping activities

Key findings: Second-level certification increases the number of parcels rented out, the area rented out, and the probability of renting out land. This is the case mainly among D/MHHs. However, over time, FHHs with any certificate were more likely to rent out land. First-level certificates may have created sufficient clarity and security to increase female household head's comfort and ability to rent out. Overall, findings align with other findings in Ethiopia that secure land tenure allows landholders to increase land transfers – specifically, women with certificates tend to rent out land and engage in sharecropping more than women without certificates (Deininger et al. 2011, Holden et al. 2011, Macours et al. 2010, Yami and Snyder 2016). Table 6.3 shows results for DID and CT estimations.

Table 6. 3. Summary of DID and CT Results on the Effects of Certification on Renting out Land.

Continuous Treatment (Effect w/each year of certification)							DID (Average Treatment Effect, Total Sample)
	Any certificate			Second-Level Certificate			
Total area of land HH rented out (hectares)							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	0.009	0.009	0.011	**0.017****	-0.012	**0.024*****	0.028
Years²	-0.000	-0.001	-0.000	**-0.001****	0.001	**-0.002*****	
Total number of parcels HH rented out on a monetary basis							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	0.013	0.007	**0.022****	**0.035****	0.014	**0.043*****	**0.102*****
Years²	-0.000	-0.001	-0.000	-0.002	-0.002	**-0.003*****	
HH rented out land							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	**0.009****	**0.024***	**0.008***	**0.013*****	0.009	**0.013*****	Not analyzed using DID
Years²	-0.000	**-0.001***	0.000	**-0.001****	-0.002	**-0.001****	

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

The DID results suggest that, while second-level certification had no statistically significant effect on the area of land rented out by households, it did increase the number of parcels rented out on a monetary basis by 0.102 parcels, on average. Although our results differ from Cloudburst's DID analysis over 2008-2015, which found no significant effects on the number of parcels or land area rented out because of second-level survey or certification compared to first-level or none, both align with certification in general potentially supporting increased rental.

In examining heterogenous effects in the DID analysis, we see households that participated in second-level certification renting out 0.012 more parcels and 0.004 additional hectares, on average, for each additional year of the head's age. A positive estimate for impact with age fits with an explanation that younger heads rent out fewer parcels because they may be more able to do farm work. According to both the FGDs and the survey data, young heads of households also own less land. We have not found literature that discusses the differences between older and younger cohorts of farmers perception of tenure security when renting. This is a potentially fruitful area for further research.

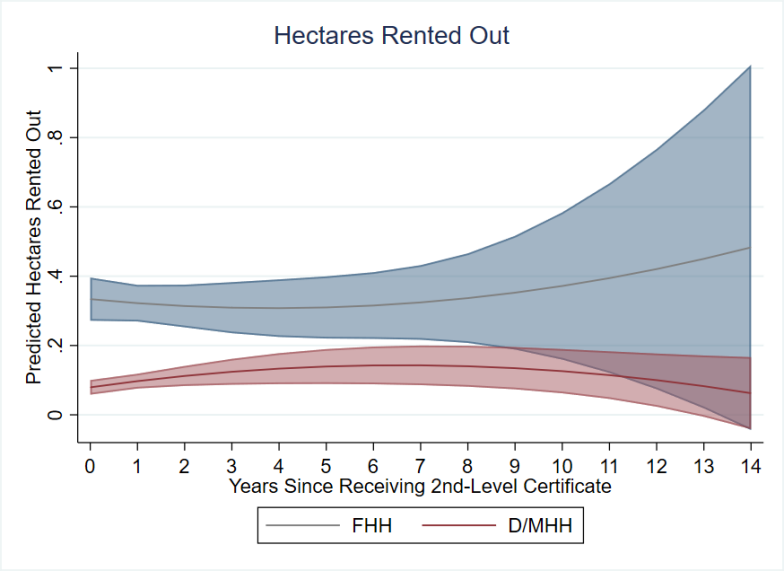
The treatment effect also falls 0.001 parcels and 0.001 hectares for each additional kilometer between the household and the regional capital, which may be a result of thinner rental markets farther from

urban centers or the importance of farming to household livelihoods in more remote areas, as well as the distance to markets to sell crops. It is also possible that the reduced risk from certification has a greater effect on rental transactions with higher property values, more likely closer to services and urban centers. Abay et al.'s (2021) findings on land rental market participation, which do not account for certification's potential effects on participation or land prices, did not show in Ethiopia significant associations between participation and distance to an urban center or distance to a market, but generally showed prices increasing with land scarcity and price per hectare decreasing with plot size.

Analyzed across all households, the CT results reveal that second-level certification increased the average number of parcels rented out by 0.033 parcels one year after certification, peaking at 0.153 additional parcels 9 years after certification. Second-level certification also increased the average area rented out, with the effect peaking at 8-9 years after certification at an additional 0.072 hectares, or 90 percent of the baseline average area rented out. In addition, second-level certification increased the probability of renting out land by 1.2 percentage points one year after certification. The effect peaks at 4.2 percentage points at year 6. Any certification increases the probability continuously by 0.9 percentage points by year. By 17 years, after receiving any certification, households are 15.3 percentage points more likely to rent out land.

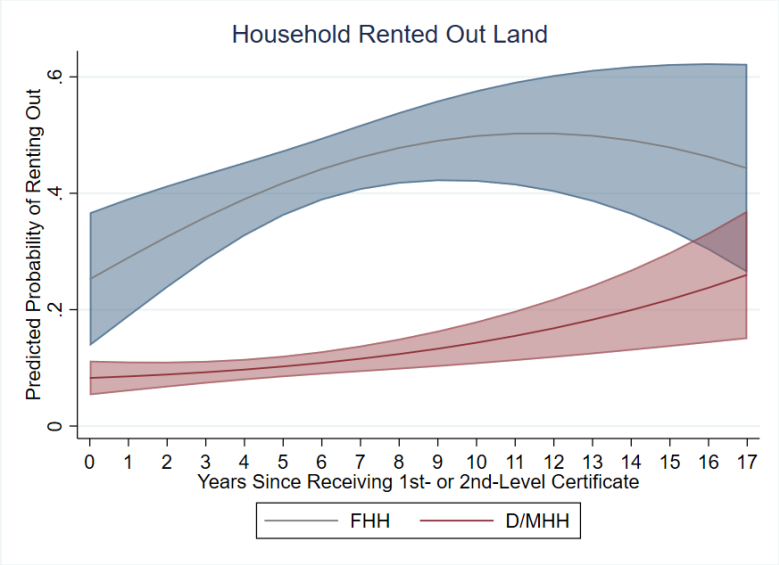
These effects of second-level certification on rental outcomes are primarily among D/MHHs. The effect of second-level certificates is not statistically significant for FHHs. D/MHHs rent out an estimated 0.04 more parcels one year after receiving the second-level certificate; the effect peaks at 0.154 more parcels at year 7 and then begins to decrease in year 8. The decrease is slow such that it is 0.152 additional parcels by year 8, 0.144 by year 9, 0.13 by year 10, etc. The effect reaches 0 between years 14 and 15. Applying the continuous treatment estimates to the 13-year period between 2008-2021 suggests that D/MHHs rent out 0.117 more parcels, similar to the DID results of 0.102, on average, for the same period. While we do not observe a statistically significant effect of any certification on the number of parcels or area of land rented out by all households, we do find that D/MHHs rent out an additional 0.022 parcels one year after receiving any certification. Figure 6.5 shows the impact of second-level certification over time on the area rented out by FHHs and D/MHHs. For D/MHHs, the effect peaks at year 5, when they rent out 0.055 more hectares.

Figure 6. 5. Impact of Second-level Certification on Area Rented out, by Gender of Head of Household



Among all households, the likelihood of renting out land increases with the years of any certification. After one year with any certification, FHHs are 2.3 percentage points more likely to rent out land. This effect peaks at year 12 for an increase of 14.4 percentage points. D/MHHs are 0.8 percentage points more likely to rent out land one year after any certification and this effect is still increasing 17 years after certification. These results align with findings from Holden et al (2007) that after certification, FHHs in Ethiopia were more likely to rent out land because they were less concerned about losing land to renters. The FGD findings support the idea that land certificates encourage female household heads and other women to rent out land because the certificate protects their rights. Note that women often rent out the land because they have less labor available to till it. The land certificate encourages renting out because it allows them to document their ownership of land if a renter tries to claim ownership. Figure 6.6 shows the predicted probability of renting out land by years of having any certification for D/MHHs and FHHs.

Figure 6. 6. Impacts of Any Certification on Probability of Renting out Land and Area Rented out by Gender of Head of Household



Qualitative data supports the finding on the impacts of certification in general (not necessarily second-level) on women renting out land, though discussion did not focus on FHHs. FGD participants still identified renting out land as a practice that widows need to engage in for cash income.

> "Previously, a person who rented the land used to force women and take away harvests more than the agreed share, but now we can confidently rent out our land and receive the harvest without any problem." (FGD women 3).

Overall, results align with other evidence that certification increases land rentals in Ethiopia (Ghebru and Girmachew 2020). Specifically, women with certificates tend to rent out land and engage in sharecropping more than women without certificates (Deininger et al. 2011, Holden et al. 2011, Macours et al. 2010, Yami and Snyder 2016). The LIFT program's combination of second-level certification with the introduction of standard land rental contracts with a network of land rental service providers may have encouraged people to enter the land rental market for the first time despite legal restrictions on land market activity (Holden and Neumann 2021). Across the three regions, responses from the FGDs showed similarities in terms of improvements in the rental payment practices, as well as the value of land, following the certification, particularly in the cases when they are also using rental contracts to formalize their agreements. However, in Amhara and SNNP regions some participants brought up issues and disputes around the rental payment. Responses from younger FGD participants highlighted disputes related to rent as a problem, while older participants indicated that rental disputes have been resolved because certification ensured their ownership rights.

AGRICULTURAL INPUTS AND INVESTMENT FAMILY OF OUTCOMES

Hypothesis 4: Certification increases household investment in productive assets – short- and long-term

Key findings: Certification has changing effects over time on use of improved seeds and fertilizer or pesticides, with initial reductions over the first 6-10 years following certification before showing a long-term positive effect. Any certification initially reduces the probability of using improved seeds, but the effect is eventually positive. The effect is not significant for FHHs. By contrast, among FHHs, second-level certificates initially increase but eventually decrease the likelihood of using improved seeds. Many of the findings on agricultural inputs are counterintuitive, not consistent by certification type (any or second-level), or statistically significant regardless of the household head's gender, and should be explored further. FHHs with any certification are less likely over time to use oxen or tractors for ploughing.

Among longer-term investments, second-level certification initially increases but eventually decreases the number of perennials planted. FHHs and D/MHHs follow the same pattern, but the effects are not significant for FHHs.

The results are presented in Table 6.4.

Table 6. 4. Summary of CT Results on the Effects of Certification on Agricultural Inputs and Investment

	Continuous Treatment (Effect w/each year of certification)						DID (Average Treatment Effective, Total Sample)
	Any certificate			Second-Level Certificate			
Number of trees planted (per ha)							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	Not analyzed using DID
Years	-0.221	-46.492	14.158	-17.406	-29.839	-13.810	
Years²	-0.201	2.794	-0.960	2.136	2.565	2.037	
Number of perennials planted (per ha)							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	Not analyzed using DID
Years	-8.679	-32.836	-2.718	14.547	48.925	7.049	
Years²	0.314	-0.749	0.558	**-2.511****	-6.279	**-1.736****	

	Continuous Treatment (Effect w/each year of certification)						DID (Average Treatment Effective, Total Sample)
Quantity of fertilizer and pesticides applied (kg/ha)							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	Not analyzed using DID
Years	24.779	-11.419	34.003	-3.517	-2.697	-3.953	
Years²	-0.115	0.259	-0.219	0.628	0.561	**0.687***	
Land area rented in by HH (hectares)							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	Not analyzed using DID
Years	-0.008	0.001	-0.010	-0.004	0.001	-0.005	
Years²	0.000	-0.000	0.000	0.000	-0.000	0.000	
HH use of improved seed							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	Not analyzed using DID
Years	-0.009	-0.009	-0.009	0.007	0.019	0.004	
Years²	**0.001****	0.001	**0.001****	-0.001	**-0.003***	-0.001	
HH used oxen or tractors							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	Not analyzed using DID
Years	-0.011	**-0.025***	-0.007	-0.005	0.012	-0.006	
Years²	0.000	0.001	0.000	0.000	-0.001	0.000	

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

There are no statistically significant effects of certification on number of trees planted or land rented in by the household. In some of the FGDs, participants mentioned that certification increased their ability to choose what to plant, including trees. However, there was not special emphasis on the certification increasing their desire to plant trees specifically.

As discussed in section IV, some evidence suggests that efforts to enhance tenure security will increase long-term investments such as planting trees (Higgins et al. 2018; Lawry et al. 2017). However, farmers may also plant trees to enhance their tenure security, implying that certification could reduce tree planting. The null effect that we observe on this outcome may reflect that these mechanisms work in opposite directions.

Second-level certification initially increases the number of perennials planted, peaking at 21 additional perennial plants 3 years after receiving a second-level certification. After 3 years, the effect begins to decline until it is negative by 6 years after second-level certification, most likely because the initial

investment in perennials shortly after certification reduces the need for additional planting in later years. Among D/MHHs, the effect of second-level certification peaks at about 7 additional perennials planted by 2 years after certification and declines until the effect is negative at approximately 5 years after certification.

Among all households and D/MHHs specifically, having any certificate initially has a negative effect on the probability of using improved seeds, but starts to increase the probability of using improved seeds by 10 years after certification. By 13 years after certification, the predicted probability of using improved seeds increases by 5.2 percentage points. The effect of years of any certification is similar but not statistically significant among FHHs. However, second-level certification initially increased the use of improved seeds among FHHs, peaking at a 3-percentage point increase 3 years after certification, but the size of the effect declines until 7 years after second-level certification when it becomes negative.

Similarly, second-level certification initially reduces the quantity of fertilizer and pesticide applied by D/MHHs, but the effect becomes positive by 6 years after certification.

The initial decreases in use of improved seeds and fertilizer following certification are counterintuitive. Possible explanations include changes in production away from crops for which improved seeds were available (or preferred) in the short-term, shifts towards crops that are typically cultivated with less fertilizer, or increased fallowing. Future analysis of the ELTAP/ELAP data could follow changes in households' portfolios of crops cultivated, land uses, and livelihoods in the years immediately following receiving a certificate to better understand which farmers are shifting away from improved seeds and fertilizer, why, and the role of certification in those shifts.

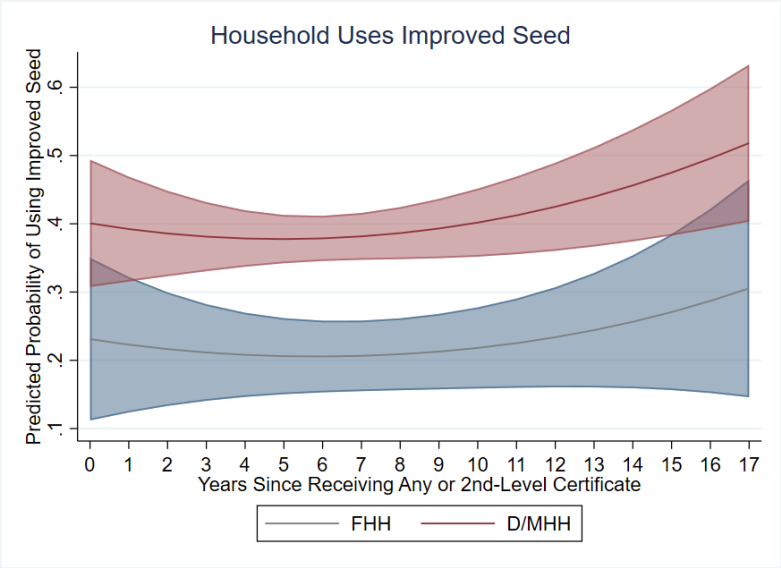
Among FHHs, having any certificate has a negative effect on the use of oxen or tractors. This negative effect is largest 12-13 years after certification, when the predicted probability of using oxen or tractors decreases by 15.6 percentage points. This could be because certification increases the probability that FHHs rent out land and, with less land to plow, there is a reduced need for FHHs to use oxen and tractors. This is the effect that we would expect, given that FHHs typically have few adult male members and are constrained by social norms against women plowing. A cross tabulation shows that from 2008 to 2021 among FHHs that rented out land, the percentage using oxen or tractor to plough declined from 70 percent to 38 percent, suggesting there are additional factors beyond certification in play.

FGD participants noted improved tenure security from land certification influenced their productivity through being able to make investments and feeling as though they have more decision-making power to cultivate as they choose. However, they also pointed out many limitations, including limited access to capital, the lack of credit for agricultural inputs, and the distance to the marketplace to obtain inputs.

> "Before getting land certificate we do not use the land as we desire. We worried if the government takes the land away from us. Thus, we were not productive. Even we cannot plant a tree on the land or cultivate a crop we wanted. Nowadays we are planting tree on our land and vegetable and whatever we desire which increase our productivity. The land certificate aids us to get loans to buy farming equipment."

"It has been changing after we get the land certificate. The problem is people in the village are not aware or do not have enough information about how to use the land certificate for investing on productive assets. The farmer in the village especially with land certificate needs training how they get benefited having the land certificate" (FGD Men 4)

Figure 6. 7. Impact of Certification on Households' use of Improved Seed by Gender of Head of Household



SOIL AND WATER CONSERVATION FAMILY OF OUTCOMES

Hypothesis 5: Certification results in households being more likely to invest in soil and water conservation

Key findings: Based on the CT estimates, we find that any certification impacts whether households invest in soil and water conservation, and dramatically so among FHHs with increases in the probability of making investments of almost 45 percentage points over 2008-2021. Eight years after certification, FHHs are on average just as likely as D/MHHs to make soil and water conservation investments, closing an approximate gap of 20 percentage points (Figure 6.8). However, we do not find a statistically significant effect of second-level certification on investment in soil or water conservation measures using DID or CT estimates.

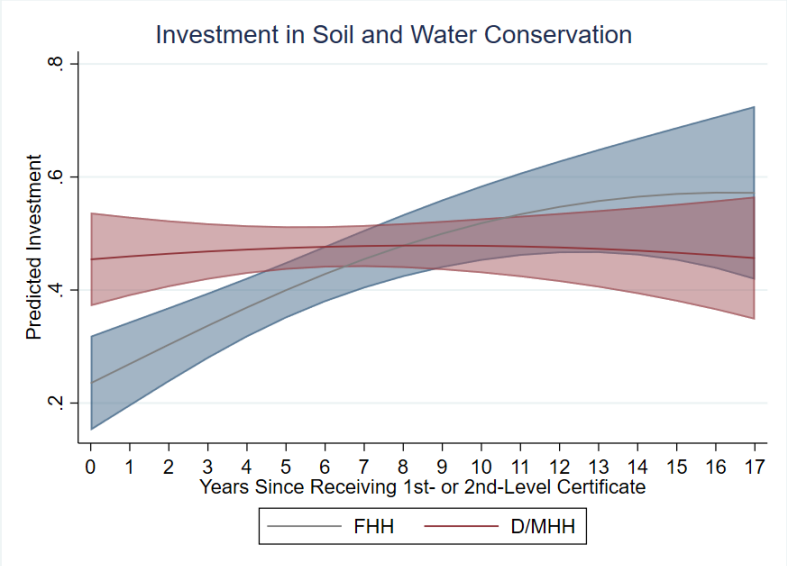
Table 6.5 presents the DID and CT results.

Table 6. 5. Summary of DID and CT Results on the Effects of Certification on Soil and Water Conservation

	Continuous Treatment (Effect w/each year of certification)						DID (Average Treatment Effect, Total Sample)
	Any certificate			2nd-Level Certificate			
	HH invested in soil or water conservation						
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	**0.014****	**0.045*****	0.006	0.005	0.025	0.000	0.125
Years^2	**-0.001***	**-0.001****	-0.000	0.000	-0.001	0.000	

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Figure 6. 8. Impacts of Any Certification on Soil and Water Conservation by Gender of Head of Household



To measure households' soil and water conservation, we used a binary variable equal to 1 if the household reported ever applying any conservation practices, such as building/maintaining bunds, hedges, making/maintaining canals, and wells, using water harvesting structures, or planting grasses, trees, or bushes.

The DID analysis shows that second-level certification did not statistically significantly increase household investments in soil or water conservation measures overall. Similarly, the Cloudburst analysis found no significant impact of second-level certification compared to first-level or no certification. However, the heterogeneity analysis finds dramatic impacts for two types of households. Second-level certification increases the probability of soil or water conservation among households headed by widows by 46.8 percentage points. In addition, among households that own more land, second-level certification decreases the likelihood of investing in soil or water conservation measures — specifically, by 5.4 percentage point per hectare of land held by the household.

The CT results find that the likelihood of soil and water conservation investments increases with years of any certification but not second-level certification specifically. The effect of any certification on the probability of making soil and water conservation investments peaks at 4.9 percentage points around 7 years after receiving a certificate. The increase is steady and much higher among FHHs such that their probability of making investments on soil and water conservation increases by 26.6 percentage points in year 7. FHHs who received a certificate in 2008 would be 41.6 percentage points more likely to make soil and water conservation estimates in 2021. These results are consistent with evidence from Rwanda (Ali et al. 2014) that certification has greater soil and water conservation impacts on FHHs. However, unlike the case in Rwanda, further investigation of the Ethiopia data shows that there is no statistically significant difference in the level of tenure security of FHHs and D/MHHs at baseline. FHHs have lower levels of investment in soil and water conservation than D/MHHs at baseline. We cannot explain the gendered differences using the same argument than Ali and colleagues (2014) because we do not find that FHHs have lower tenure security in Ethiopia at baseline. Further analysis with the ELTAP/ELAP dataset that control for whether households are located in areas where policies mandate land soil and conservation investment and new qualitative data could help understand the differences between FHH and D/MHH responses to certification.

One factor potentially diminishing any impact of certification on soil and water conservation practices is a legal regulation that states that farmers who do not take steps to protect land from erosion or do not invest on soil and water conservation practices risk losing their land. FGD participants referenced this regulation and 99 percent of *kebele* authorities interviewed posited that their *woreda* authorities were engaged in enforcing these government measures. Although only 42 to 52 percent of households report using soil and water conservation practices in any of the three survey rounds, this is higher than the 31 to 43 percent of households who report having parcels located on sloping lands where soil erosion caused by water is a problem (see Table 5.9). Soil and water conservation projects that were present in 10 percent of the 183 *kebeles* may have increased the number of households in those *kebeles* undertaking soil and water conservation investments. However, any such projects and authorities' propensity to enforce regulations would have been captured in the models' fixed effects if they do not vary over time.

TENURE SECURITY OUTCOMES

Hypothesis 6: Certification results in stronger perceived tenure security for women and men

Key findings: Impacts of certification on tenure security differ by how perceived tenure security is measured. Qualitative findings support the expected linkage that people perceived greater security because of certification, especially for women, and are more concerned about loss of land from development or corruption. Qualitative discussions allowed participants to define tenure security and risks more broadly than the measures used in the quantitative analysis. The quantitative findings, which specifically measure tenure security as perceived risk of government redistribution or perceived ability to decide how to bequeath land, show that any certification and second-level certification initially increase but eventually decrease perceptions that land will be redistributed in the future. This shift towards perceiving more tenure security takes about 10-12 years. Additionally, having any certificate initially reduces but eventually increases the likelihood that household heads feel more secure lending to certificate holders. All quantitative findings are driven by the effects of certification on D/MHHs.

Table 6. 6. Summary of DID and CT Results on the Effects of Certification on Tenure Security

	Continuous Treatment (Effect w/each year of certification)						DID (Average Treatment Effect, Total Sample)
	Any certificate			Second-Level Certificate			
HH head perceived heritability of land							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	-0.001	-0.005	-0.001	0.003	-0.001	0.002	0.014
Years²	-0.000	-0.000	0.000	-0.000	-0.001	0.000	
HH head perceived redistribution of land in near future							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	0.009	0.006	0.010	**0.011***	-0.010	**0.019****	-0.050
Years²	**-0.001****	0.000	**-0.001****	**-0.001***	0.001	**-0.002****	
HH head perceived security in lending to certificate holders							
	All	*FHH*	*D/MHH*	*All*	*FHH*	*D/MHH*	
Years	**-0.013****	-0.010	**-0.014****	0.006		0.005	0.052
Years²	**0.001***	0.000	0.001	-0.001		-0.001	

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

DID estimates found no statistically significant impacts of second-level certification on the probabilities that the head of the household believes they have the right to bequeath land, believes land redistribution in their *kebele* is likely, and would feel more secure in a credit-based business transaction with a farmer

who holds a land certificate than a farmer who does not – although the effects move in the expected direction of more security as Federal Proclamation 456/2005 made forced redistribution of rural land illegal. This may have influenced low perception of increased tenure security against redistribution of land. The DID analysis also found that second-level certification had smaller impacts among wealthier households on the probability of believing they have the right to bequeath land.

CT results show that both second-level certification and any certification impact household heads' belief that land redistribution in their *kebele* is likely. Counterintuitively, we observe an initial increase in perceived likelihood of redistribution of land shortly after receiving a certificate. However, over the 13-year period from 2008-2021, second-level certificates decrease perceptions of likely redistribution by about 2.6 percentage points, from 24 percent of household heads at baseline to 21.4 percent by follow-on. The effect of any certification is twice as large, reducing perceptions of likely redistribution by 5.2 percentage points over the same time-period. Although these are statistically significant results for the estimations using all households, results appear to be driven by D/MHHs (Figure 6.9).

CT results also indicate household heads who had certificates were less likely to feel that having a certificate made a potential borrower less risky. Having any certificate reduced the probability that household feel more secure lending to certificate holders for the first 12 years and then starts to increase. This effect is statistically significant for all households and for D/MHHs. This may be linked to the lack of legal mechanisms to claim land from people that may not pay back a loan. Given that in Ethiopia, land cannot be taken from a person to pay a debt, this may reflect people's perception that those with land certificates have stronger tenure rights than those without certificates so that people in debt with land certificates can legally resist any attempt of a lender to confiscate their land if they do not pay a loan.

Across the qualitative FGDs in the three regions, responses align with certificates being supportive of perceived tenure security.

> "Having the land certificate shows the land belongs to you. After we receive the land certificate it was a relief, we were not worried if our land would be taken from us, by the government or by those who have powers. Now we are confident that we can pay our taxes and work on the land. Even if I have the land certificate it does not comprise loans from any organization…" (FGD men 4)

Although FGD participants acknowledged the different access to land that women and men had, in all FGDs participants perceive that women's use rights to land were stronger after the certification programs because of the legal recognition of their rights, as well as the rights of wives, and the fact that the certificates included women's photos as an additional element that provided increased tenure security. This finding aligns with the findings by Ghebru and Girmachew (2020) who used ELTAP/ELAP/LIFT data for a quasi-experimental impact evaluation. They find that the second-level certification program had different impacts on the perceived tenure security of female respondents depending on whether the risk, or fear of losing land, was associated to divorce, inheritance or boundary related issues (called 'private tenure risk'), than if the source of the risk was the fear of losing land due to expropriation and/or eviction by private investor (called 'public tenure risk' by the authors).

Female spouses feared both types of risks, while FHHs were feared only private tenure risks. Men, on the contrary, report lower perceived tenure security. Ghebru and Girmachew (2020) hypothesize that the fact that the SLLC is predominantly administered by issuing joint land certificates to heads and spouses could explain why men feel that SLLC brings them insecurity when compared to the status quo of no joint use rights. A 2008 paper by Tefera and Holden suggests that some men may feel less tenure secure after their wives' name is included in the certificate because of the possibility of losing their land to their wives after divorce. We do not find evidence of this in our FGD; when men discussed women's tenure security, they discussed it in positive terms, not as a loss to their own tenure security.

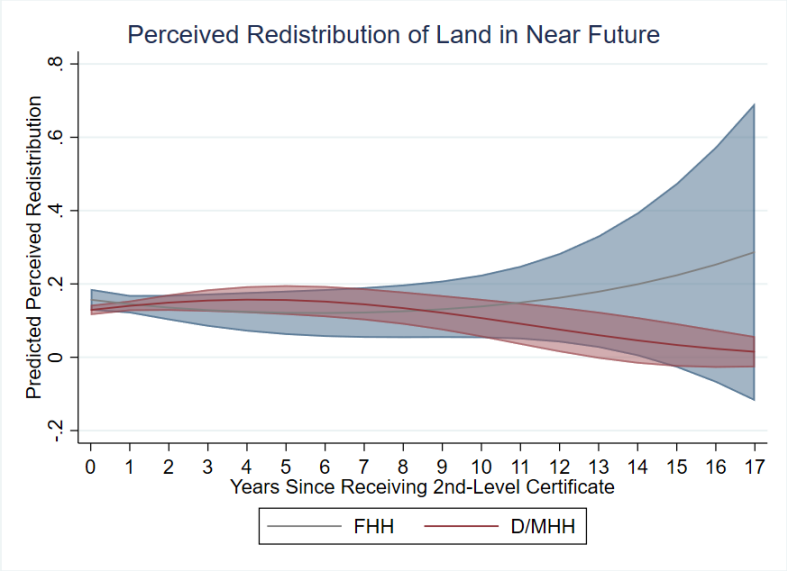
FGD respondents in areas where polygyny is practiced, in Oromia and SNNP, highlighted that the rights of first and second wives have now become more secured. In a FGD in SNNP, men stated

> "The name of both spouses has been written on the land certificate. Thus, if any dispute happened to them, they would know that they managed it based on their land certificate. In previous times, women were highly deprived of these rights. Even there was this saying in our community that the husband could have three to four different wives with a single dress. This means he could fire his wife and changed different women in his own homestead. Again, the father of the wife begs the husband for reconciliation when dispute occurred. There was no place to go for a divorced woman. But, today they both know their rights and duties so that they live in harmony. We really believe and appreciate this. We are happy about this change(…)"

> "Yeah, let alone he would share his asset (in the past), he (would) fire her with a low-quality dress called *shama* from his home. But recently husbands don't even try to do such things, because they know the consequences. If he tries to fire his wife, he knows that he will be out instead." (FGD 6)

Qualitative FGDs do not speak to perceived risk of redistribution but do reflect participants' concerns about corruption on land management committees, the absence of certificates, and change in the use of land to develop urban centers may still expose people to the risk of losing land. Some FGD participants suggested they feared that once the decision about expropriation for urban development is made, the certificates may not be enough to avoid losing their land. The FGDs also align with findings by Deininger et al. (2011), Holden et al. (2011), Melesse and Bulte (2015) and Yami and Snyder (2016) that explain that in Ethiopia, the perceived pre-program lack of tenure security that was born out of the participants' fears of expropriation was high. FGD participants often discussed their feelings of tenure insecurity based on the recent history of disruptive land redistribution under the Derg regime from the mid-1970s to 1991 and by subsequent state governments. When participants were asked their views about land takings and other events that could potentially lead to insecurity, they recalled the 1997 land redistribution in Amhara but noted that land takings are not a major concern if land is certified. Prindex 2019 data also indicate that while government expropriation is one source of tenure insecurity in rural Ethiopia — 25 percent of the 21 percent of tenure insecure rural residents reported fear of government expropriation as a reason for insecurity — it is a less prevalent source than perceived risk of owners asking residents to leave (72 percent), insufficient money or resources (56 percent), disagreements with relatives (34 percent), or death of a household member (28 percent) (Authors' calculations).

Figure 6. 9. Impact of Second-level Certification on Perceived Risk of Redistribution by Gender of Head of Household



WIVES' EMPOWERMENT AND DECISION-MAKING OVER LAND FAMILY OF OUTCOMES

Hypothesis 7: Certification increases wives' involvement in land management and land-related decisions

Key findings: Certification increased wives' possession of land and certified land. It is unclear that this translates into wives' decision-making power over land, for which there were differing results between DID and CT analyses. Wives in polygynous marriages experienced negative impacts on possession of land and decision-making.

According to the DID results, second-level certification increased whether wives had certificates for land in their possession, the number of parcels that wives possess, and wives' self-reported ability to rent out their land.

The CT results showed initial increases from any certification and second-level certification in whether wives possess land, the number of parcels wives possess solely or jointly with their spouses, and the total area of land wives possess solely or jointly with their spouses. However, the effects eventually decline. Any certification also increases the number of parcels and the area of land possessed by wives solely, peaking at 0.39 additional parcels 8 years after certification and 0.16 additional hectares of land 6 years after certification. Second-level certification initially has a positive effect on the probability that wives have a certificate of title for land in their possession, but the effect becomes negative approximately 9 years after receiving a second-level certificate. Surprisingly, having any certificate initially decreases the predicted probability that wives can rent out land in their possession and decide what to grow on land they possess (self-reported), but the predicted probabilities start increasing 11 years after certification for renting out land and 16 years after certification for crop decisions.

Tables 6.7 and 6.8 show estimated effects of certification on women's land ownership and decision-making over land using several variables. In the DID analysis we run the estimations on all wives, including multiple wives when present. In polygynous households, up to two wives were invited to the respond to the wives' survey at baseline and endline.

Table 6. 7. Summary of DID and CT Results on the Effect of Certification on Wives' Possession of Land

Continuous Treatment (Effect w/each year of certification)			DID (Average Treatment Effect, Total Sample)
	Any certificate	Second-Level Certificate	
Wife possesses land in her name			
Years	**0.028*** **	**0.035*** **	0.013
Years²	**-0.002*****	**-0.003****	
Wife has certificate for her land			
Years	0.007	0.016	**0.224*** **
Years²	0.000	**-0.002****	
Number of parcels possessed by wife solely or jointly			
Years	**0.182****	**0.294*** **	**0.894***
Years²	**-0.013*** **	**-0.20****	
Number of parcels possessed by wife solely			
Years	**0.097*** **	0.042	0.174
Years²	**-0.006*** **	-0.000	
Area of land possessed by wife solely or jointly (hectares)			
Years	0.061	**0.106*****	-0.606
Years²	**-0.008*****	**-0.006**	
Area of land possessed by wife solely (hectares)			
Years	**0.050*** **	0.025	-0.246
Years²	**-0.004*****	-0.001	

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

In the DID findings, wives in households that participated in second-level certification are not more likely to possess land at all but do possess more land and are more likely to have a certificate. These wives are on average over 22 percentage points more likely to have a certificate for land in their possession and possess 0.89 more parcels of land than wives in untreated households. Neither of these effects was statistically significant in the prior evaluation. There were also no statistically significant effects on wives' sole possession of land. The findings suggest that second-level certification efforts to reach wives made substantial progress in doing so and in certifying land to which wives have joint claims, but certification has not increased wives possessing land by themselves.

- The CT results for outcomes of wives' landholdings are presented separately for households with any certificate and those with a second-level certificate in Figures 6.10- 6.14. The number of years that households have any or second-level certificates are associated with short- and medium-term increases in the likelihood that wives have land in their name, the number of parcels that wives possess solely or jointly, and the area of land that wives possess solely or jointly.

- The probability of wives possessing land increases with any certification and peaks at an additional 9.8 percentage points by year 7; for second-level certification, the effect is slightly more pronounced, peaking at 10.2 percentage points by year 6.

- We do not observe an effect of any certification on whether wives have a certificate for land in their possession. However, second-level certification initially increases the probability that wives have certificates, but after 9 years the effect is negative.

- The effect of any certification on the number of parcels possessed jointly or solely by wives peaks at year 7 at an additional 0.6 parcels for any certificate, and an additional 1.1 parcels for second-level certificates. When we examine the effects of certification on wives' sole possession of parcels, having any certificate increases the number of parcels owned until year 8 when it peaks at 0.39 additional parcels; there is no effect for second-level certificates.

Figure 6.13 shows how the predicted area that wives possess solely or jointly changes based on the number of years that households had any certificates or second-level certificates. The effect peaks at an additional 0.12 has 4 years after receiving any certificate and an additional 0.47 has 9 years after second-level certification. Given the baseline value of 0.87 ha of total land in wives possession, these are substantial increases.

There were several heterogenous effects of receiving or being surveyed for second-level certificates on the probability of wives possessing land (see Annex Table 3.12). Most dramatic is the 34 percentage point decrease for wives who were in polygynous marriages at baseline. In SNNP, where polygyny is common, first-level certificates were supposed to be issued in the name of the head and main wife while other wives were supposed to get a certificate in their own name (Deininger et al. 2008). However, Holden and Tefera (2008) found very few cases in which polygynous wives had only their names on the certificates. They suggest that this discrepancy between the requirements and implementation resulted from protests on the part of polygynous men, who wanted their name listed on all certificates. It is possible that men in polygynous unions used second-level certification as an opportunity to expropriate

land from their wives. However, it is important to note that, according to the descriptive statistics, 93 to 98 percent of polygynous and monogamous wives possessed land, regardless of treatment status.

We also observe a 1.5 percentage point decrease in the probability that wives possess land for each year of the head's age at baseline, a 2.4 percentage point decrease for each hectare of land possessed by a household, and a 0.1 percentage point decrease for each kilometer of distance to the regional capital. Similarly, for each year of the household head's age, second-level certification reduces the area of land that wives own solely or jointly by 0.33 hectares and the area of land that wives own solely by 0.14 hectares.

There were also negative effects on the area that wives own solely or jointly for each kilometer of distance to the regional capital. By contrast, second-level certification increases the number of parcels that wives own solely by 0.84 parcels.

Figure 6. 10. Average Marginal Effects of Any- and Second-level Certification on Whether Wife Possesses Land

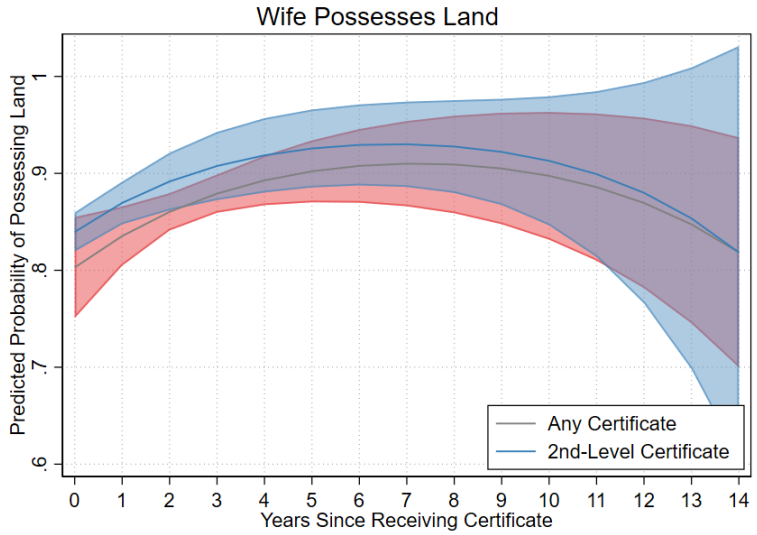


Figure 6. 11. Average Impact of Any- and Second-Level Certification on Number of Parcels Possessed by Wife Solely or Jointly with Spouses

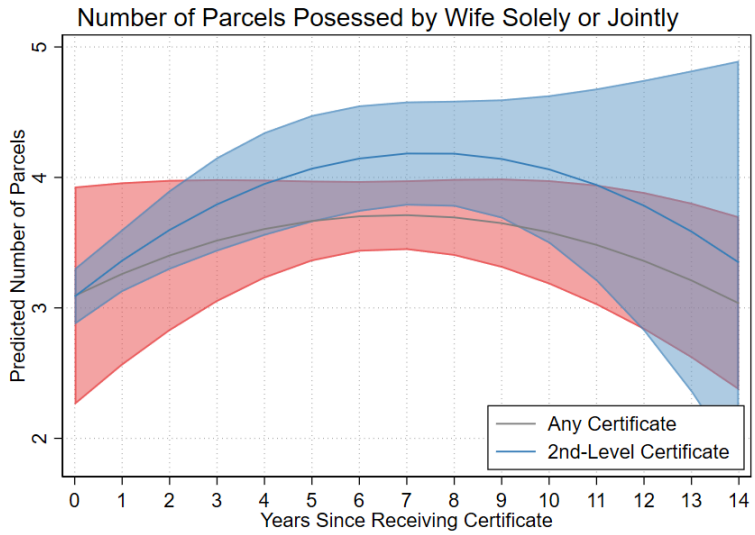


Figure 6. 12. Average Impact of Any- and Second-level Certification on Number of Parcels Possessed by Wife Solely

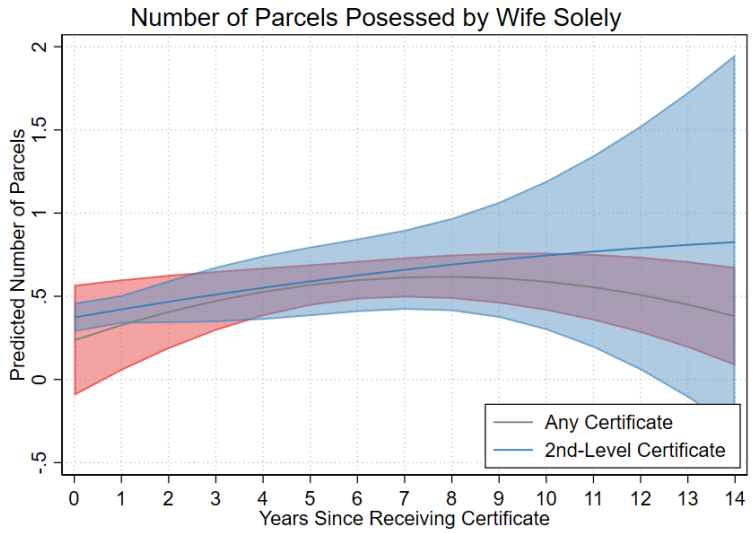


Figure 6. 13 Average Impact of Any- and Second-level Certification on Area of Land Possessed by Wife Solely or Jointly with Spouses (Hectares)

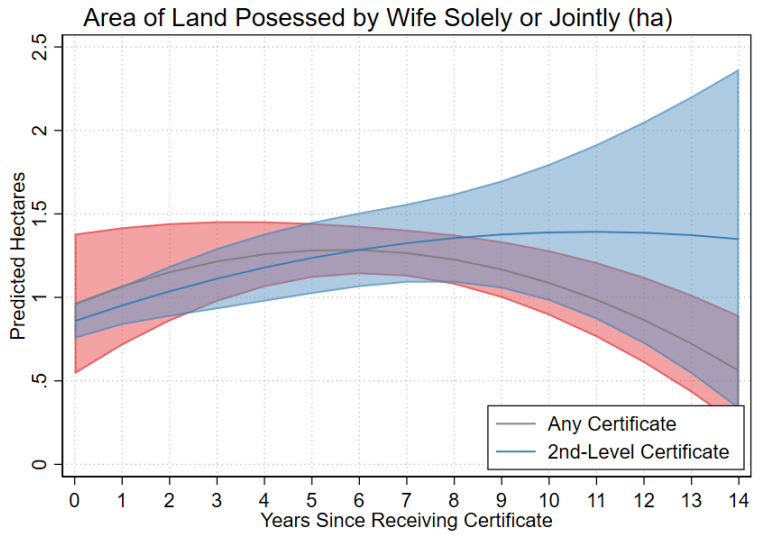


Figure 6. 14. Average Impact of Any- and Second-level Certification on Area of Land Possessed by Wife Solely (Hectares)

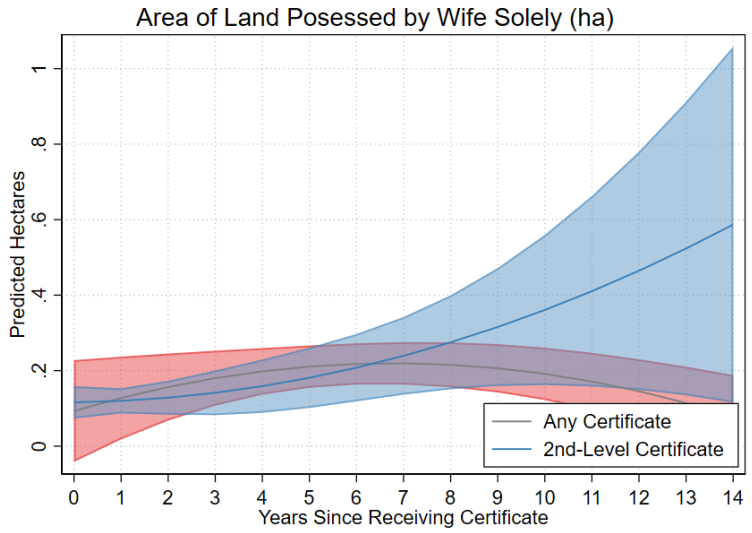


Table 6. 8. Summary of DID and CT Results on Effects of Certification on Wives' Decision-Making over Land

	Continuous Treatment (Effect w/each year of certification)		DID (Average Treatment Effect, Total Sample)
	Any certificate	Second-Level Certificate	
Wife decides what crops to grow on her land (self-reported)			
Years	**-0.021****	-0.006	0.071
Years²	**0.002*****	-0.002	
Wife decides what crops to grow on her land (HH head-reported)			
Years	Not analyzed using CT		-0.054
Years²			
Wife can rent out her land (self-reported)			
Years	-0.020	0.009	**0.219*****
Years²	**0.002****	-0.002	
Wife can rent out her land (HH head-reported)			
Years	Not analyzed using CT		0.047
Years²			

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Using the DID approach, we separately present results on wives' decision-making using wives' self-reported responses and the male household head's responses. We examine whether women can decide about their crops, and if women can decide to rent out their land.

We do not observe any statistically significant effects of second-level certification on whether wives decide what crops to grow on their land. However, heterogeneity analysis points to differential impacts by wealth and marriage type. Second-level certification had a larger effect on the probability that wives decide what to grow, according to household heads' reports, in households with greater baseline wealth. Second-level certification also increased the probability that wives in polygynous unions report that they decide what to grow on their land by 35 percentage points; using responses from male household heads shows a decrease of almost 45 percentage points as a result of second-level certification. Second-level certification statistically significantly increases the probability that a wife reports she can rent out land by 22 percentage points, on average, compared to wives (not only wives in polygynous unions) in households without second-level certificates. The model that uses household heads' reports about wives' ability to rent out land (column (4)) is not statistically significant and has an

average effect approximately one-fifth that of the model using wives' self-reported data. We do not observe any statistically significant heterogenous effects for wives' ability to rent out land.

The difference in the results depending on whose responses were used highlights the importance of collecting self-reported data from wives to assess their own rights and experiences. The higher explanatory power, represented by the R-squared, of models using wives' self-reported data also suggests that there may be less noise in these data than in husbands' reports about their wives.

Figure 6.15 shows the CT results for whether wives report deciding what crops to grow on their land. Surprisingly, the predicted probability that wives can decide what to grow on land they possess (self-reported) decreases with each additional year that a household had any certificate and was not statistically significant for second-level certification. This negative treatment effect persists for 15 years after receiving a certificate. Given the strength of traditional gender norms against women's decision making on economic issues among the study population, we hypothesize that the results may also suggest that wives initially give up some decision-making power in exchange for ownership. Note that treatment is defined at the household level, so the effect we observe here is the effect since the first plot owned by the household was certified, not necessarily the wife's plot that this question is enquiring about. This result may point to the need to move from analysis at the household to the individual level, as much of the literature on gender and assets suggests. Since we conducted the analysis following the original project design, we use the household as the unit of analysis. We think this is a topic that should be further investigated either through further analysis of this evaluation's dataset or with a sampling design that allows for better tracking of individuals over time.

In contrast to the DID results, the CT results suggest that having second-level certificates does not affect whether wives can decide to rent out their land at their discretion (self-reported). The effect of second-level certification on whether wives can rent out land in their possession was not statistically significant; any certification initially reduces the probability that wives report that they can rent out land in their possession, but the effect becomes positive 11 years after receiving a certificate. This result suggests that women may start renting out later in their life cycle — perhaps when they face more challenges to plow their land.

Both the literature and qualitative data support the idea that, despite improvements to women's legal standing, women remain subordinated in Ethiopia. This is deeply rooted in traditional social norms that must be addressed to realize changes in the effective use of land certificates.

> "Women's subordination, which was founded on deeply ingrained traditional attitudes and beliefs, is the main challenge for women to have land certificate. Furthermore, the society believes women are not capable of handling administrative issues."
>
> "There are still barriers to women to obtain land certificates. The main challenge is largely attributable to the negative attitudes and harmful traditional practices which deny our right to own, administer and control the land."
>
> (Female FGD participants)

Other evidence also suggests that there is a need to improve attitudes towards women's inheritance, one of the main forms to access land in Ethiopia. In Bezu and Holden's 2014 study on land and youth based on interviews to 600 sons or daughters (15-29 years old) and heads of households from 266 households in 16 villages in Oromia and SNNP, at least 90 percent of the household heads were willing to transfer at least part of their current farm to their children, but approximately 75 percent of the heads of households said they would not bequeath land to their daughters (Bezu and Holden, 2014). Parents often consider that the marriage of their children is the appropriate time to transfer land to them. However, they favor their sons because they expect women to leave and access land through marriage. Our FGD participants suggest that youth have few means of accessing land by renting it or buying it because of their difficulties finding occupations that will render profit enough to save for renting or buying land. This leaves women with mainly one way to acquire land — through joint ownership facilitated by marriage with a landowner. An FGD participant explained:

> "Men can inherit land from their parents. Culturally a woman cannot inherit land from her parents. It is said that when she gets married she can share a land with her husband. And if her parents died, she asks her brother for piece of land that her parents leave." (Women FGD 7)

In contrast with the quantitative findings in this study that suggest modest improvements on wives' ability to make decisions over their crops and over renting out, participants in our FGDs perceived that land certification enhanced women's empowerment. Often, male FGD participants noted women's empowerment as one of the most important changes related to certification while others said that certification gave women confidence and decision-making ability.

All our findings are happening in a context of general improvements in women's rights in Ethiopia in a larger context of inequitable gender norms that present a barrier to women's empowerment and affect women's access to assets and decision-making power regarding land (Deininger et al. 2011; Holden et al. 2011; Kumar and Quisumbing 2015; Melesse and Bulte 2015). The presence of legal frameworks supportive of gender equality for land rights at national and regional levels helps explain the relatively favorable social inclusion outcomes for Ethiopia's land certification program (Holden and Tilahun 2020; Kumar and Quisumbing 2015; Lavers 2017; Melesse and Bulte 2015). Reforms to the federal Family Code in 2000 accorded "equal rights to spouses during the conclusion, duration, and dissolution of marriage" (Kumar and Quisumbing 2015:409); similar reforms were implemented in Tigray, Oromia, Amhara, and SNNP over the next five years. Women's rights to land were further strengthened with the issuance of the federal 2005 Land Proclamation, which required joint land registration (Kumar and Quisumbing 2015; Melesse and Bulte 2015). Kumar and Quisumbing (2015) argue that it is the combination of the 2000 Family Code and the 2005 Land Proclamation that has enabled women to benefit from certification, because together they provided a "mutually reinforcing" legal framework that promoted equity for women in land access and tenure security and because the land certification projects are often accompanied by workshops about women's land rights. Kumar and Quisumbing (2015) underscore the importance of policies requiring that women serve on Land Administration Committees (LACs), reporting that the presence of female members on these committees had a positive effect on changing perceptions that assets would be divided equally between spouses in the case of divorce. Having a woman in the LAC increases women's knowledge of land registration and their

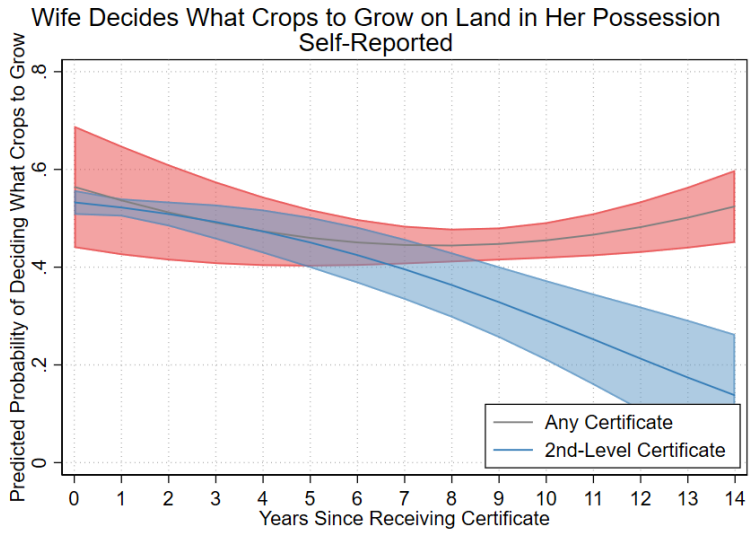
attendance at meetings (Kumar and Quisumbing, 2015) and is also associated with a smaller gender gap in knowledge of the land registration process (Kumar and Quisumbing, 2014).[42]

Whether people adapt to these legal reforms, which support gender equality, depends on social norms and implementation of law, both of which vary by region. In regions with social norms that favor men, many women continue to access land through male relatives (Kumar and Quisumbing 2015; Lavers 2017). Regional differences in how the state legal framework intersects with local social norms may lead to positive outcomes for women in some areas and negative outcomes in others (Holden and Tilahun 2020; Kumar and Quisumbing 2015; Lavers 2017). Local tenure norms in Oromia made it difficult for women listed on joint titles to actualize their rights at their husband's death or upon divorce (Lavers 2017).

Given the strength of social norms, state intervention alone may not be sufficient to provide women with equal control of land (Ahmed 2017). In many regions, women traditionally move to the home of the husband upon marriage. Social norms prescribe husbands to oversee land management. FGDs suggest that in all the regions the social norm still prescribes that only men can cultivate with oxen or tractors. FHHs, therefore, face problems with land management when they do not have sons and therefore commonly rent out much of their land or engage in sharecropping contracts. Women heads of households may be less tenure secure because of their limited ability to till the land and the demand for land by (male) in-laws and natal family. The designers of the interventions expected land certificates to strengthen the position and ability of female land possessors to rent out land without risking the loss of possession. However, the decision about when to rent out land may be more likely to be made by a woman when she is a FHH, than when she is a wife who is still expected to make decisions about land with her husband.

[42] Despite official requirements that each LAC have at least one female member, early analysis of first-level certification revealed that only one fifth of LACs had complied with this stipulation (Deininger et al., 2008).

Figure 6. 15. Average Marginal Effects of Any- and Second-level Certification on Whether Wife Decides What Crops to Grow on Land in Her Possession, Self-Reported



IPV OUTCOMES

Hypothesis 8: Land certification decreases the probability of a woman experiencing IPV.

Key findings: We find associations between wives having their names on land certificates with substantial reductions in the risks of experiencing emotional IPV but not the risk of physical or sexual IPV. Wives that live in households that have certified plots, but do not have their names on land certificates, have an increased risk of any IPV. The analysis did not find statistically significant associations between living in a house where plots have a certificate (any or second-level) and the risk of physical and sexual IPV. Qualitative findings support the perceived importance of women having their name (and photo) on second-level land certificates, particularly as strengthening wives' claims and deterring husbands from violence because of the potential consequence of losing land in the case of divorce. These findings suggest that second-level certification's promotion of co-registering land to spouses may have ongoing influence to prevent emotional IPV.

Indicators of unequal gender norms and behaviors, such as higher indices of women's justification of violence and husband's controlling behaviors, are associated with a higher risk of IPV, while having a husband that helps with household chores, an indicator of more equitable gender norms is associated with wives' lower risk of IPV. This suggests that indicators for social norms are strong predictors of IPV.

We estimate the effect of land certification on the probabilities of women experiencing any type of IPV, emotional IPV, and physical or sexual violence using two different samples. To examine the relationship between second-level certification and wives' risk of IPV, we apply the models to the 1,492 wives[43] from

[43] Only one wife in each household was surveyed about controlling behaviors and IPV.

the 2021 ELTAP survey round who answered questions about IPV. Because few wives in the 2021 ELTAP sample lack certificates, there would not be a sufficiently large comparison group to compare having any certification versus no certification. Instead, we create a second sample by combining the 2021 ELTAP wives' sample with a matched subset of women from the 2016 Ethiopia DHS from the study regions. This matched sample has 2,614 women. Using the matched data from the DHS allows us to have a larger control group of women whose households or who themselves do not have certification than was possible only using the 2021 ELTAP survey.[44] Because the DHS does not differentiate between first-level and second-level certification, we can only analyze associations for any land certification.

Figures 6.16 and 6.17 summarize the prevalence and overlap in emotional, physical, and sexual violence for each sample. Fifty-nine percent of the 1,492 wives in the 2021 ELTAP sample and 48 percent of the 2,614 wives in the matched ELTAP/DHS sample reported having experienced any form of IPV in the last year before the survey. These percentages are not far from the results of the DHS 2016.

As explained in the methods section, for each IPV outcome variable we estimate three models. In the first model, we use variables that are commonly associated with the risk of experiencing IPV. In models 2 and 3, we add our variables of interest: having a land certificate and having the wife's name in the land certificate. Table 6.9 summarizes the marginal effects of second-level and of any certification on the probabilities that a wife experiences any IPV, emotional IPV and physical and sexual IPV for model 3. Annex 6 shows the full results, including the effects of each covariate in the 3 models

[44] The second approach addresses the problem of lacking a control sample when the treatment is defined as having any certification by leveraging the DHS. Because the DHS does not distinguish between first-level and second-level certification, this second approach considers any certification (not specifically second-level). To create the matched ELTAP/DHS sample, we use the Demographic Health Survey (DHS) data for Ethiopia from 2016 to create larger comparison groups using propensity score matching and entropy balancing. We merge these data with the ELTAP data using Propensity Score Matching – PSM to create a larger sample. We start by identifying the best set of predictors of treatment using the ELTAP 2021 sample to iterate logistic regressions using all possible combinations of eight to fifteen predictors and choose the combination that maximizes the Akaike Information Criterion. Next, we use propensity score matching based on the optimal set of predictors to assign observations in the DHS and ELTAP samples to treatment groups defined as having any certification and having the name of the wife in their land certificate. We estimate propensity scores from a logistic regression model for the treatment group, and then match ELTAP 2021 observations to the five nearest neighbors in the DHS sample only for the data from households in Amhara, SSNP, and Oromia.

Table 6. 9. Summary Marginal Effects on the Probability of Women Experiencing Any IPV and Types of IPV

Marginal effects and Standard errors for full Models. *		
	Any certificate	Second-Level Certificate
ANY IPV		
HH with certificate	0.1372* (0.0557)	.0144 (0.0428)
Woman's name in certificate	-0.0156 (0.0360)	-0221 (0.0412)
EMOTIONAL IPV		
HH with certificate	0.0660 (0.0527)	**0.1171** (0.0380)**
Woman's name in certificate	-0.0641* (0.0351)	**-0.1254** (0.0376)**
PHYSICAL or SEXUAL IPV		
HH with certificate	0.0896 (0.0555)	**-0.0100 (0.0423)**
Woman's name in certificate	0.0080 (0.0347)	**0.0459 (0.0400)**

Standard errors are reported in brackets next to marginal effects
Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Second-level land certification only showed a statistically significant relationship with emotional violence. Wives whose households have a second-level land certificate are 12 percentage points more likely to experience emotional violence compared to a mean probability of 41 percent. However, the wife having her name on the certificate effectively counteracts this increased risk, lowering the probability of experiencing emotional violence by 13 percentage points. Having her name on a second-level land certificate means that there is a document that is registered in an office and has a photo of both spouses (when land is owned by a married couple).

Any land certification showed statistically significant relationships with any IPV and emotional violence. Wives whose households have a land certificate are 13-14 percentage points more likely to experience any IPV, compared to a mean probability of 48 percent. A wife having her name on the land certificate did not significantly mediate this increased risk. For emotional violence however, having her name on a land certificate decreased the wife's probability of experiencing emotional violence by 6 percentage points, compared to a mean of 33 percent.

We expect that women with names on land certificates will have improved tenure security and stronger fallback position or leverage. Thus, a wife's position may be weak in households that have certificates without the wife's (or wives') name. Second-level certification's emphasis on joint certification for spouses may explain why we see larger reductions in IPV risk in the ELTAP 2021 analyses.

Women who own homes are associated with an increased risk of any, emotional, and physical or sexual IPV. Having her name on a title for the house is associated with a substantially lower risk. In the ELTAP 2021 sample, a wife's homeownership is associated with increased risk of emotional IPV by 12 percentage points, and 25-27 percentage points for risks of any IPV and physical or sexual IPV. However, having a title for a house and having her name on the title is associated with lower risk, decreasing the initial risk. For emotional IPV, having a title for the house alone cancels the association with the increased risk associated with owning a home; having her name on the title is associated with a further reduced risk by 9 percentage points. For physical or sexual violence, a wife having her name on the title for the house is associated with a full reduction in the risk associated with home ownership. In the matched ELTAP/DHS sample, a wife owning her own home associates with increased risk of any, emotional, and physical or sexual IPV by 8-15 percentage points depending on the IPV variable. A woman with a home is associated with an increased risk for IPV. A wife having her name on a title for a household is associated with a substantial decrease in the risk of IPV.

We identify several factors that are associated with a reduced risk for IPV. Having a home title is associated with reduced risk for IPV. This finding is consistent with the literature that suggests that housing tenure may be at least as important as land tenure for preventing or escaping IPV. Panda and Agarwal (2007) in a seminal study in Kerala, India, shows that home and land ownership by women lower their risk of experiencing IPV. In 2011, Bhattacharyya, Bedi and Chhachhi tested this in Uttar Pradesh and West Bengal and find further evidence of the protective function of homeownership against IPV. Further evidence from Nicaragua (Grabe 2010; 2012) and by Hillard et al. (2016) show evidence of the protective effect of owning a home or land against IPV. However, not all evidence shows that this relation is always positive or conclusive (Boudreaux 2019). Using the 2010 Ecuador Household Asset Survey (EAFF) and the 2010 Ghana Household Asset Survey (GHAS), nationally representative surveys for Ecuador and Ghana, respectively, Oduro, Deere and Catanzarite (2015) investigate the relationship between women's ownership of assets and physical and emotional abuse by spouses. The authors find that women's share of couple wealth is significantly associated with lower odds of physical violence in Ecuador and emotional violence in Ghana. This association is mediated by the household's position in the wealth distribution. This study shows evidence that land ownership itself may not be enough to explain IPV. There are not many studies that explore the protective role of homeownership on IPV. Wetweke et al., (2014) find that property or asset ownership may be an important element in raising women's economic and social status, but the effect is mediated by the ability of women to exercise

control over an asset such that women with low social and economic status may have more difficulties using their ownership of assets as protective against IPV. The role and importance of housing tenure in preventing or responding to IPV merits further study in general, and in the context of Ethiopia given our findings.

In addition to a wife having a home title and a wife having her name in the home title, having a spouse that helps with household chores is also associated with lower risk of IPV in all the models we analyzed. In only two models in the ELTAP/DHS sample analysis, we find associations between other wealth indicators, namely, larger plots and more animals, which seem to factor into a lower probability of experiencing IPV. Factors associated with a wife being at greater risk of experiencing any, emotional and, sexual or physical IPV are being in polygynous marriage, a younger age at marriage,[45] higher justification for violence[46], having a husband who works off-farm, and having a husband who exhibits more controlling behaviors. Older women were also more likely to have experienced physical or sexual violence. Compared with wives living in Amhara, wives in Oromia were more likely to experience any IPV or emotional IPV and less likely to experience physical or sexual violence; wives in SNNP were more likely to experience emotional IPV and less likely to experience either any IPV or physical or sexual IPV. For each outcome variable, the size and statistical significance of these factors' associations are robust across the three models.

Qualitative findings indicate that the second-level certification process, which promoted joint spousal registration, and the second-level certificate itself, with wives' names and photos, enhanced wives' fallback position and bargaining power, which may reduce IPV.

> "Previously when there is divorce in family, the wife simply collects her clothes and bag and goes. Currently because of land certificate, the marriage … is respected and she is the owner of the land."
>
> "Even husbands are now respecting their wives because they do not want to lose part of the land due to divorcing."
>
> "With regards to divorce, previously, when there was divorce, wives may die by the exhaustion of the long argument between the husband and her. But now because there is a land certificate and my picture in the certificate, it is proved that I am the owner of the land. Therefore, without any conflict, we can share the land. By this, we are benefited due to the land certificate."
>
> (Female FGD participants)
>
> "Previously, women were not able to ask for farmland and did not even know their rights related to access to farmland. But after the certification, women began to ask for their right to

[45] Studied on the effects of child marriage on IPV show that adolescent wives experience high levels of IPV in Ethiopia. For example, see Presler-Marshall, E., Jones, N., Dutton, R., Baird, S., Yadete, W. Woldehanna, T., Guday, E. and Gezaghne, K. (2020) 'Girls don't shout if they are raped… that is taboo': exploring barriers to Ethiopian adolescents' freedom from age- and gender-based violence. Report. London: Gender and Adolescence: Global Evidence.
[46] This variable was not associated with emotional IPV but was associated with physical or sexual IPV and any IPV.

> have farmland legally. For example, if I divorce with my wife, she has now the right to take half of the land, so it helped women assure their rights."
>
> "Women are now equally benefited, even they are now able to have their own legal share after they divorce."
>
> "Things were in favor of men or the head of the household, mostly men. But now if she has divorced, she can have a certificate separately with her own share having photo posted on it."
>
> (FGD Participants, Male 45)

One male FGD participant articulated the potential influence of women's improved fallback position on IPV.

> "Domestic violence has decreased because of the land certificate. Men are afraid to lose half of their land because of divorce. If there is domestic violence, there is high chance of a wife leaving her husband or files for divorce. It is not like we've seen in our mothers' times. There is a huge change regarding domestic violence."

The influence of second-level land certification on women's fallback position and risk of IPV occurs in a larger context of slowly changing social norms and legal reforms that support women's equal land rights. Some FGD participants felt that legal reforms to enable reporting IPV as a crime, not land certification, were responsible for perceived decreases in IPV. The GoE has improved statutory norms, particularly the 2005 Revised Family Code, that aim to guarantee the same rights to land for men and women spouses and that mandate that land shall be common property (Mekonen et al., 2019). However, many researchers suggest that legal changes are still in their infancy. The current statutory laws have many caveats including that Article 63 of the Revised Family Code states that registration of rights is not the final word on ownership of marital property with the legal presumption being that all property shall be deemed common property even if registered in the name of one of the spouses, unless such spouse proves that he is the sole owner thereof (Mekonen et al 2019). Several studies point to the existence of legal pluralism as one of the sources of challenges to women's land rights (Lavers 2015) In some regions, traditional norms are more important than statutory law in matters related to land rights, marriage, and conflicts related to IPV. Therefore, it is key to identify how customary authorities can play positive roles in conflict resolution in cases of IPV and conflicts linked to land that represent effective justice mechanisms for women instead of reinforcing harmful norms. Programming that targets customary authorities as agents and promoters of positive social norms change is important.

VII. CONCLUSION AND RECOMMENDATIONS

This evaluation contributes to building the evidence of long-term impacts of land formalization. It examines impacts of Ethiopia's land certification on households' tenure security, participation in rental markets, and agricultural inputs and investments. This is important to assess theorized effects outcomes that either require longer periods of perceived tenure security for people to change their behaviors, sustained behavior change, or otherwise take longer to see observable changes (ex. women's empowerment, rental market participation, and larger agricultural investments). This evaluation's longer time-frame combined with continuous treatment analysis enables more visibility into the timing of when effects occurred, when they were smaller or larger, and when they were positive or negative to inform program and policy design to enhance returns to certification.

In light of second-level certification efforts to engage female-headed households and wives in certification processes and promote co-registration, we also assess impacts of certification on women's land ownership and land-related decision-making and also assess association with IPV.

Although this evaluation builds on the 2016 Cloudburst evaluation of ELTAP/ELAP and aimed to use the same definitions of outcomes, we repeat the caution against directly comparing results across evaluations because there are substantial differences in their samples and some differences in outcome variables. That said, in this longer-term assessment, we do observe statistically significant results for dispute resolution outcomes, rental outcomes, soil and water conservation, and women's land ownership and decision-making that were not observed in Cloudburst's DID analysis over 2008-2015. It is possible that our longer timeframe and continuous treatment analyses capture these changes because effects for households that received certificates later materialized later or may not have been statistically significant during the 2008 to 2015 analysis, or because effects that happened only for a small number of years appeared diminished using DID.

Below we summarize key takeaways of the evaluation relevant to the research questions in Section II. We then propose policy recommendations and suggest avenues of further research based on evaluation results.

CONCLUSIONS

LONG-TERM EFFECTS OF CERTIFICATION ON HOUSEHOLDS' WELL-BEING (RQ 1 & 2)

We highlight key takeaways of certification's effects over time by outcome. Impacts of certification on several outcomes change over time, highlighting the value of using the CT approach. By "long-term" we mean 7-10 years after treatment.

Perceived tenure security

Summary statistics and qualitative findings indicate increased perceived tenure security from 2008 to 2021, with most of the improvement happening between the 2008 and 2015 survey rounds: in the CT sample the perceived risk of government expropriation declined from 24 percent to 10 percent, and nearly all

household heads in 2021 believed they would be able to bequeath their land, compared to 37 percent in 2008. Even as the perceived risk of overall government expropriation declined, participants in FGDs expressed concerns that certificates are not sufficient to protect their land from expropriation once lands in their areas are planned for urban development or from corrupt land management committees.

However, the contribution of second-level certification to these improvements is unclear and differs by how tenure security was measured. Qualitative findings indicate that people see second-level certificates as showing clear, socially, and legally recognized, and enforceable claim. Empirical results did not show large impacts of second-level certification on household heads' perceived tenure security as measured by perceived risk of government expropriation and ability to bequeath land. Over the 2008-2021 study period, the percentage of households perceiving a risk of government expropriation would drop from 24 percent to 20 percent among households with second-level certification — 4 percentage points of the 14 percentage point decrease seen in the total CT sample. Second-level certification and any certification initially slightly raised households' perceived risk of land redistribution over the first 7 to 11 years, possibly because of the increased government attention to land, before reducing perceived redistribution risk in the long-term.

Dispute Resolution

Any certification, whether first- or second-level, has potential to reduce uncertainty and administrative costs from land disputes. One year after receiving a certificate, disputes took an average of 4.5 fewer days to resolve. Using the baseline estimate of 7 percent of households experiencing a dispute, certification would save a lower bound of 649 days of insecurity for households and associated administrative time for local leaders in conflict resolution. Actual savings are higher because the impact of certification increased over time. People viewed second-level certificates as accessible, clear, and legally recognized proof of their own claims and others' claims. Impacts on dispute resolution time were even larger for FHHs and households farther from regional capitals.

Credit

Second-level certification's long-term impacts on credit outcomes are limited and mainly applicable to D/MHHs. Farmers' preferences and the overall supply of credit may be more important factors for credit access than having a second-level certificate. The percent of households accessing credit has remained fairly constant (at 2 to 3 percent over 2008 to 2021 in the CT sample). Qualitative results suggest farmers mainly used certification to access formal credit, while many, especially women, continued to prefer informal sources of credit. Where financial services were accessible or where land certification efforts worked to intentionally increase the supply of certificate-linked credit, as in LIFT, there may be an initial increase in credit access.

Second-level certification increases the likelihood of households obtaining credit. However, it does not affect the amount of loans obtained. Models suggest that the average impact of second-level certification on the probability a household uses land to access credit increases by 3 percentage points over approximately the first 5 years after receiving a certificate, before the impacts begin to decline and eventually become negative around year 11. One interpretation is that households for whom land certificates could open

access to credit leveraged their title soon after receiving it – this would be consistent with Cloudburst's findings of more households taking out higher amounts of credit over 2008 to 2015.

Renting out land

Having a second-level certificate slightly increased the likelihood of renting out land and the amount of land rented out, primarily among D/MHHs. These impacts are increasingly positive in the short term but level off after 7 to 10 years. While these increases are small in the scope of the full sample, they correspond to substantial changes in rental markets. The increase in area rented out is only 4 percent of a household's baseline hectares owned at the highest, but a more than 90 percent increase in area rented out. Using the baseline prevalence of only 9 percent of households renting out land as households' initial probability of renting out land, households with a second-level certificate would have a probability of 10 percent one year after receiving the certificate and 13 percent at 6-7 years later, when certification's impact is at its highest. These increases correspond to nearly 7,000 households from ELTAP/ELAP alone newly renting out land as a result of certification.

FHHs' rental outcomes were more responsive to holding any certificate than specifically holding second-level certificates. Among FHHs, having any land certificate increased the likelihood that the household rented out land but did not affect the amount of land rented out. There was no greater impact from having a second-level certificate specifically. It is possible that there are differences in whom FHHs and D/MHHs are renting to, in the land's use and area, and in heads' tenure security such that the added security from second-level certificates specifically is needed to facilitate increased renting out among male-headed households.

The increased renting out of land associated with certification may unlock an alternative income source for households, potentially contributing to resilience. This avenue may be especially important for FHHs who typically face even higher constraints to profitable agricultural production (Ministry of Agriculture and Natural Resources et al. 2018; Mulema and Damtew 2016).

Agricultural input use and investments in soil and water conservation:

Observed impacts on short-term inputs – use of improved seeds, fertilizer and pesticides, and oxen or tractors for ploughing – were either statistically insignificant or counterintuitive and had different directions across inputs. While there is little reason to expect that certification would reduce inputs, farmers' practices for these inputs, especially for annual crops, may be more limited by input and output markets and available resources than on perceived tenure security. In FGDs farmers' consistently noted difficulties in obtaining inputs, such as long distances to markets where they are available, lack of credit, and limited access to capital. The impact of certification on use of improved seeds, especially, needs further study: any certification and second-level certification showed statistically significant effects in opposite directions and only among D/MHHs.

Except for tree-planting, farmers' longer-term investments increased with certification. Households with second-level certificates, especially D/MHHs, planted more perennials in the first 3-6 after receiving a second-level certificate. Having any certificate dramatically increased the likelihood that FHHs invest in

soil and water conservation, closing the gender gap in probability of investment in approximately 7 years.

LONG-TERM EFFECTS ON WIVES' LAND OWNERSHIP AND DECISION-MAKING (RQ 3 & RQ5)

Second-level certification efforts to promote joint registration increased the likelihoods that wives had land and had documented land rights, strengthening their legal, if not social, claim to land. From the DID results, wives whose households underwent second-level certification are, on average, 26 percentage points more likely to have a certificate for land in their possession and possess one more parcel of land than wives in untreated households. Neither of these effects was statistically significant in the prior, shorter-term evaluation. Second-level certification primarily increased wives' joint land possession, with no impact on land owned solely. According to the CT results, after 10 years of her household having a second-level certificate, she would on average possess 0.48 additional hectares either solely or jointly.

Wives' decision-making over land appears to have increased dramatically over time, but the contribution of certification to that increase is unclear. From 2008 to 2021, the percentage of wives reporting they could decide to rent out land or what crops to grow increased from less than 10 percent of wives to over 50 percent of wives. Impacts of second-level certification on women's decision-making about land are mixed and require further study. Quantitative results show sizeable statistically significant effects of certification's impact on whether a wife reports she can rent out her land, but in different directions depending on the analytical method used. Whether a wife can decide what crops to grow appears negatively affected by certification in the CT analysis, with no significant effect from the DID. Decision-making over land and agriculture is still rooted in social norms and gendered roles and responsibilities such that it may be slower to change over time, but a result of no significant change is still somewhat surprising. Both the literature and qualitative data support the idea that, despite improvements to women's legal standing, women remain subordinated in Ethiopia. This is deeply rooted in traditional social norms that must be addressed to realize changes in the effective use of land certificates.

Although we did not specifically examine whether having her name on certificate helped resolution of women's land disputes, quantitative results suggest that having a certificate (either second-level or any) does speed the resolution of FHHs' land disputes, and qualitative findings suggest that people see persons who have their names on second-level certificates as having legitimate and enforceable rights. Barriers to women accessing justice, as mentioned by qualitative research participants, include attitudes and expectations that women do not understand land issues or governance and cannot manage land well. Other structural barriers related to literacy, distance and/or cost to access services, and constraints on women's time and mobility are also likely to be relevant, though we do not specifically examine them in this report.

CERTIFICATION AND IPV (RQ4)

Although the nature of the samples does not permit interpreting findings as causal, the findings show a clear association between certification and likelihood of experiencing emotional IPV. Importantly, it is the wife having her name on a land certificate (or also a document for housing) that is associated with lower risk of emotional IPV, not the household having a certificate. Wives whose households have a second-level land certificate are 12 percentage points more likely to experience emotional violence compared to a mean probability of

41 percent. However, the wife having her name on the certificate effectively counteracts this increased risk, lowering the probability of experiencing emotional violence by 13 percentage points. Qualitative data supports the idea that wives having their names on second-level certificates increases their bargaining power in the marriage by improving their potential fallback position in divorce. These findings suggest that second-level certification's promotion of co-registering land to spouses may have ongoing influence to prevent emotional IPV. We did not observe statistically significant associations between certification and likelihoods of sexual or physical IPV.

RECOMMENDATIONS

Policy recommendations below draw directly from evaluation findings and focus on land governance and administration, as opposed to efforts focused on agricultural programming or gender equity.

Policy Recommendation 1: To unlock the potential for land certification to improve rural livelihoods and agricultural productivity, land certification efforts, in Ethiopia and elsewhere, should consider incorporating approaches to improve the availability, accessibility, and relevance of agricultural inputs and services to women and men smallholder farmers.

Credit is one complement to land for which the general supply to smallholders is limited and so potential impacts of second-level land certification on credit use will be limited. Efforts like those by the LIFT program to (1) shape policy and regulations to allow certificates to legally be used to access credit and (2) develop loan products that allow farmers to use second-level certificates to access financing that is also better tailored to agricultural production cycles and smallholder farmers' overall finances show promise, enabling farmers to leverage their second-level land certificates for capital. Further research on what elements of these approaches were most impactful and for whom, as well as process evaluations of good practices and scalable practices for implementing these approaches, would be valuable.

On the demand size, only the Amhara land proclamation allows land to be used as a collateral. Advocacy to include this content in other regional land proclamations will help eliminate one barrier. On the demand side, the low use of second-level certificates to access credit suggests either that people are unaware that they can leverage their certificate for credit, are unaware how to do so, or have low demand for credit or different demand that what is on offer — these possibilities are not mutually exclusive. For the regions relevant to this study, our qualitative data and studies from LIFT indicate that women prefer informal credit and take out much smaller monetary amounts but still have unmet demand for credit. These align with general wisdom and experience around rural women's financial inclusion. Programming should be designed with an understanding of gendered demand for credit to develop and/or tailor loans and services offered. Programming could also raise awareness of the possibility, risks, and benefits of using second-level land certificates to obtain credit and the steps to take if people choose to do so. It will be important to sensitize both women and men, especially so that wives and husbands do not violate each other's rights on jointly held land.

We recommend taking a similar approach for other agricultural inputs and investments in terms of intentionally linking them to any land certification efforts, informed by an understanding of gendered

demand and access. These linkages can be direct — for example, an activity/project could partially de-risk loans that offer better terms to certificate holders — or a more facilitative approach to improve service delivery in geographies where certification is taking place. LIFT offers promising example for a complementary service/tool with creating a standard rental contract to lower the costs of and simply the contracting process and to increase perceived security of rental transactions by creating a common understanding of renters' and landlords' respective rights.

Land certification programming could look for ways to support extension services or improve the accessible supply of seeds women are likely to use, potentially through coordinating with other projects and market actors to increase the flow of improved seeds and information about them.

Building on FHHs' response to increase soil and water conservation, it could be similarly useful for land programming to identify services or information it can provide to further decrease the monetary and labor costs of making these investments.

Policy Recommendation 2: Land registration programming should emphasize registering land, both agricultural and residential, in women's names, both to uphold women's land rights and to potentially protect against IPV. Programming also needs to continue to raise awareness and social acceptance that regardless of marital status, women can also be either joint or sole registrants and do not have to be married or household heads to have their names on a certificate. Land programming (and agricultural programming) should also deliberately address social norms that dampen women's decision-making over land use and agricultural production.

Given the results that show a relationship between a household receiving any certification and elevated risk of IPV when women's names are not on certificates, all programming should deploy measures to mitigate IPV risks. Guidelines should include the requirement to conduct rapid assessments to identify risks, identify demographic or economic factors associated with higher risk (ex. young women, single women, widows, or women belonging to specific ethnic groups or levels of income), identify providers of services to mitigate risks or adequately bring justice to women who experience IPV as a result of land certification processes. Government officials and staff in offices that conduct land certification programs should be adequately trained to spot cases, to conduct prevention activities (workshops, informational public sessions involving women), or refer cases to the appropriate service providers.

Policy Recommendation 3: For certificate holders to reap the benefits of second-level certificates, the certificates need to be up-to-date and in the hands of (or easily accessible to) households and individuals. Government investments in delivering existing second-level certificates and processes to update the names on certificates as people bequeath, subdivide, or otherwise transfer their rights are needed to ensure the continued benefits of certification.

Although second-level certificates are registered with the government, having their own copies may not only increase holders' feeling of tenure security but also allow them to more easily and quickly present the certificate to resolve land disputes, to engage into rental contracts, or to obtain financing. It is also possible that having ready access to a copy of the certificate could enhance women's bargaining power within marriage or at least logistically help women present their claims in the face of conflict related to inheritance or divorce or on occasions when their rights have been violated.

Investments in keeping records of second-level certificates updated over time should be inexpensive, as simple as possible, and widely accessible so that it is easy and affordable for landholders to register changes. Procedures should seek to preserve and expand the gains to women's land rights from second-level certification so that in the long-term women still have their names on certificates, and formally documented land rights do not revert to being held at the household-level or primarily by men. Administrative practices can continue to promote spousal co-registration when landholders seek to update or transfer their rights. Procedures can also reinforce the need for consent of persons named on the certificate to approve transfers. Investments in keeping second-level certificates up-to-date will also require awareness-raising efforts in the community to encourage people to update their records and explain how to update them.

Policy Recommendation 4: Investigate the need for increased oversight of land management committees, other duty bearers, and decision-making and implementation around urban development and communities understanding of how these actors and decisions are expected to function according to the law.

Although the datasets collected to evaluate ELTAP and ELAP can support a range of additional analyses, recommendations here focus on improving data collection to better address evidence gaps that this evaluation could not and on analyses to explain findings with greater depth. These recommendations are consistent with USAID's Research Agenda for Land and Resource Governance for more longitudinal and long-term analyses, more rigor and intersectionality research on women's land rights, and considering land tenure in conjunction with other complementary factors contributing to development outcomes; principles of how to use data to drive decision-making in USAID's 2020 Gender Equality and Women's Empowerment Policy; best practices in the Guidelines for Impact Evaluation of Land Tenure and Governance Interventions developed by the Global Land Tool Network and International Fund for Agricultural Development (Lisher 2019); and lessons from assessing women's empowerment in agricultural and environmental research (Elias et al. 2021).

Research Recommendation 1: Invest in mixed-method impact evaluations to understand long-term, gendered impacts of land and resource governance programming. This requires investing in collecting individual-level self-reported data from both women and men to more accurately assess how they experience positive or negative effects from the program, including changes in empowerment and social relationships. The differences we observed in how husbands and wives perceived women's land rights are reminders of the importance of self-reported data and need to account for intra-household dynamics in understanding and advancing women's land rights. Qualitative research allowed participants to raise issues important to them in their own words that were related to evaluation questions that the survey did not address in depth — for example, concerns about corruption in land management and urban development; informed interpretation of quantitative results; limited access to agricultural inputs and gender discriminatory social norms; and allowed participants to convey their sense of tenure security holistically, based on what is important to them, not only on what questions were asked in the quantitative survey.

Research Recommendation 2: We also recommend that future quantitative impact evaluations aim to follow or at least track individual women and men over time with their own unique identifiers, to

better understand how individuals use land certificates over time and how their empowerment, decisions, and well-being change.

Research Recommendation 3: Estimating certifications' impact on yields requires investing in data to estimate yields with sufficient accuracy and more complex analysis.

At a minimum, measuring yields requires data on the quantity produced of each crop as well as the area planted with each crop. Ideally, this would be done for each parcel to link the parcel's certification status and whose names are on the certificate with the identity of the parcel manager(s) and yields. Carletto, Dillon, and Zezza (2021) provide a useful overview of the issues and potential solutions to the challenges of measuring yields, such as correcting these biases through crop cuts on sub-samples, using a combination of satellite images, "ground-truthing" from field observations, and administrative data. The Global Strategy to Improve Agricultural and Rural Statistics, a capacity-building initiative of the Food and Agriculture Organization of the United Nations, developed a *Handbook on crop statistics: improving methods for measuring crop area, production and yield* to offers guidance for National Statistics Offices to improve techniques for collecting yield data (FAO 2018).

Future analyses to isolate the impacts of certification on yields should consider monetizing yields to have a single unit of interpretation and account for local market prices for agricultural inputs and outputs, notable shocks and patterns in weather, other shocks such as COVID-19 and conflict that could affect labor availability and market access, and characteristics of the households' agricultural lands and crop composition.

Research Recommendation 4: Assess the contributions of certification to individuals' and households' welfare in the context of program/policy efforts to increase the supply of and demand for agricultural credit and other financial services, investments in perennials and soil and water conservation, and participation in rental markets.

Our results suggest modest impacts from certification on smallholders' agricultural investments and practices. However, they also suggest that certification and perceived tenure security may not be the most limiting factors for smallholders. Evaluations of agricultural programs and financial inclusion efforts can also examine the contribution of certification on their target outcomes. Additionally, evaluations of packages of interventions that combine certification (or other efforts to increase tenure security) with tools to increase agricultural productivity and resilience, could provide stronger evidence of the right combination of products and services required to increase individual's and households' welfare in rural areas.

Research Recommendation 5: Investigate the extent to which certification preserves wives' land rights and perceived tenure security after separation, divorce, and widowhood. In theory and as FGD participants relayed, having wives' names on a certificate strengthened their claims in the event of divorce and widowhood and affected their bargaining power during marriage. The current study does not assess the extent to which these expectations of greater security for wives upon the dissolution of marriage were realized. We do not yet understand how land rights changed after divorce, whether wives retained any land or the full amount they were legally entitled to, or whether wives had and used enhanced bargaining power to negotiate more favorable terms of divorce/separation. We do not know

the extent to which certification helped widows to retain land, for how long, or with what degree of perceived security. Findings suggest that these questions may have different answers for wives in polygynous versus monogamous marriages. To answer these questions, we recommend using mix methods designs. Surveys with purposive sampling of divorced/separated and widowed women that ask retrospectively about land tenure and marital status could be combined with qualitative research that involves women and men, community leaders, and government officials involved in managing family disputes and inheritance. Being able to follow individuals over time across survey rounds would allow for better understanding of how women's land tenure changes during and in the years following the dissolution of marriage, and certification's role in those changes. The ELTAP/ELAP data can assess widows' tenure at the time of the survey and potentially compare with matched non-widows. However, they cannot capture how tenure changed after widowhood or divorce.

Research Recommendation 6: Consult with local leaders, and as relevant, historical administrative data, to validate the use of certificates, especially second-level certificates and maps, in resolving disputes and faster dispute resolution times, and to understand who (in terms of gender, marital status, land size, location, and other factors) is and is not making use of dispute resolution services.

Research Recommendation 7: More evidence is needed to understand what complementary policy and processes need to be present for certificates to facilitate rental market participation; who (in terms of gender, marital status, age, location, and other characteristics) does and does not rent land out; who does and does not rent land in; how and why certification affects their rental decisions; and who benefits from increased rental. Consider implementing and evaluating interventions like LIFT's rental contract templates and brokers in geographies with differing rates of baseline rental market participation. To understand who is benefitting from any increased renting, examine rental income as a households' overall income, if households use rental as a source of continuous income or more when in distress, as well as gendered decision-making over renting out joint land and income from renting land out.

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ANNEXES

ANNEX I: DID TREATMENT GROUPS

The power calculations for the 2021 round indicate the sensitivity and precision of the analysis by estimating the minimum detectable effect size (MDES) implied by the sample size that was established in earlier rounds of data collection. The panel's sample size was designed to have sufficient power to detect changes in land tenure outcomes. While power calculations are important for planning and designing impact evaluations to estimate the sample size needed to detect effect sizes of interest, the study may detect different effect sizes with different levels of precision depending on the actual changes in outcomes and actual variation in the data collected.

The power analysis of the 2021 round of survey data accounts for its smaller sample size resulting from not collecting data in Tigray and excluding the ELAP sample. The calculations compute MDESs for the four treatment groups in Cloudburst's difference-in-differences evaluation: Group A included full or partial second-level certification as the treatment group compared to first level certification as the control group; Group B includes households with full second-level certification as treatment compared to households with first level certification as control; Group C includes partial second-level certification as treatment compared with households with first-level certification; and Group D includes households with full or partial second-level certification compared with households only first-level certification or no certification.

Table A1.1. Treatment and Control Definitions and Household Sample Sizes Used in DID 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 = 970) Households with second-level surveying and second-level certification (survey only, and survey + certified combined)	(Household N = 223) 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 = 772) Households that were surveyed and received a certificate of possession under second-level (surveyed and certified households only)	(Household N = 223) 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 = 198) Households that had their land surveyed under second-level process, but did not receive a certificate of possession (surveyed households only)	(Household N = 223) Households that have first- level certification only
D: Full or partial second-level certification relative to no or first-level certification.	(Household N = 1785) Households with second-level surveying and second-level certification (survey only, and survey + certified combined)	(Household N = 472) Households with no certification or first-level certification

Source: Households Survey Impact Evaluation of Land Certification in Four Regions in Ethiopia 2008, 2014, 2021 waves.

For all the comparison groups, we followed the same procedure to compute the (MDES) for each of the outcome variables. We define the effect size, known as "*δ,*" for a two-sample means test, as the difference between the experimental group mean and the control-group mean, $\delta = \mu 2 - \mu 1$. We specified a desired power of .80, the control-group mean and standard deviations of the difference in means between follow-on (2021) and baseline (2008) for each outcome. In all calculations, we used the sample-size information; the number of *kebeles*, and the average number of households in each *kebele*. *Kebeles* were treated as clusters. The number of *kebeles* in each of the comparison groups varied because the changes in the treatment implied that some households received either first level certification only, surveys for second level certification, or second level certification. Given the nature of the dataset, and the fact that baseline data collection was designed and implemented independently of the current evaluation design, the team had to recalculate the intra-cluster correlation coefficients (ICCs) for each of the outcome variables for each of the four comparison groups. This was also done to confirm there was sufficient power to detect effects across the different treatment definitions, given the smaller sample size for the 2021 round.

Tables A1.2-5describes the composition and sample sizes of the treatment and control groups for the 4 comparison groups. The team conducted post data design analysis by calculating MSE and power for all the comparison groups. The results of the post design analysis show that comparison group D is the group with more outcomes with statistically significant results, as in the Cloudburst evaluation. For all the groups, we calculated the minimum detectable effect size for three different possibilities, power at .8, .7 and .6. Only comparison group D had enough power for at least 1 indicator in each of the families of outcomes. This is also the reason why we concentrated the analysis on the comparison group D in the body of the report. We used the same thresholds as the Cloudburst report.

Table A1.2. Treatment A Comparison Groups by Certification Status

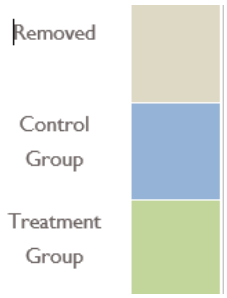
Treatment A	Certification Status as of 2021				
Certification Status at Baseline	None	1st Level	2nd Level Survey	2nd Level Certificate	Total
None	84	165	196	619	1,064
1st Level	39	223	198	772	1,232
Total	123	388	394	1,391	[1]2,296[2]

Table A1.3. Treatment B Comparison Groups by certification Status

Treatment B	Certification Status as of 2021				
Certification Status at Baseline	None	1st Level	2nd Level Survey	2nd Level Certificate	Total
None	84	165	196	619	1,064
1st Level	39	223	198	772	1,232
Total	123	388	394	1,391	2,296

Table A1.4. Treatment C Comparison Groups by certification Status

Treatment C	Certification Status as of 2021				
Certification Status at Baseline	None	1st Level	2nd Level Survey	2nd Level Certificate	Total
None	84	165	196	619	1,064
1st Level	39	223	198	772	1,232
Total	123	388	394	1,391	2,296



ANNEX 2: DID HETEROGENEOUS EFFECTS

Annex Table A2.1 Heterogeneous Treatment Effects: Amount of Credit Taken for Farming

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	-0.003	-0.003	0.108	0.024	0.093	0.090
	(0.002)	(0.002)	(0.110)	(0.027)	(0.083)	(0.086)
Year x Treatment d	0.007	0.021	0.092	0.007	-0.074	-0.012
	(0.067)	(0.064)	(0.218)	(0.072)	(0.122)	(0.157)
Year x Female-headed HH at baseline	0.264					
	(0.311)					
Year x Treatment d x Female-headed HH at baseline	0.007					
	(0.340)					
Year x HH head is a widow at baseline		0.272				
		(0.323)				
Year x Treatment d x HH head is a widow at baseline		0.009				
		(0.370)				
Year x Age of HH head at baseline (years)			-0.001			
			(0.002)			
Year x Treatment d x Age of HH head at baseline (years)			-0.002			
			(0.003)			
Year x HH wealth index at baseline				-0.041		
				(0.046)		
Year x Treatment d x HH wealth index at baseline				-0.036		
				(0.069)		
Year x Area of land possessed by HH at baseline (hectares)					-0.032	
					(0.028)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					0.054	
					(0.037)	
Year x Distance to regional capital at baseline (km)						-0.000
						(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)						0.000
						(0.001)
Constant	0.059***	0.059***	0.059***	0.059***	0.059***	0.062***
	(0.022)	(0.022)	(0.020)	(0.021)	(0.020)	(0.023)
Households	989	989	989	989	988	807
R-squared	0.009	0.009	0.003	0.005	0.003	0.003

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects. Credit outcomes were not measured in the same way at baseline, so the results compare endline to the follow-on survey, excluding households that were treated by endline.

Annex Table A2.2 Heterogeneous Treatment Effects: Whether Households Take Credit for Farming

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	0.000	0.000	0.010	0.002	0.008	0.008
	(0.000)	(.)	(0.010)	(0.002)	(0.007)	(0.007)
Year x Treatment d	0.015**	0.015**	0.041*	0.013**	0.015	0.023
	(0.006)	(0.006)	(0.022)	(0.007)	(0.011)	(0.015)
Year x Female-headed HH at baseline	0.024					
	(0.027)					
Year x Treatment d x Female-headed HH at baseline	-0.003					
	(0.030)					
Year x HH head is a widow at baseline		0.025				
		(0.029)				
Year x Treatment d x HH head is a widow at baseline		0.001				
		(0.033)				
Year x Age of HH head at baseline (years)			-0.000			
			(0.000)			
Year x Treatment d x Age of HH head at baseline (years)			-0.001*			
			(0.000)			
Year x HH wealth index at baseline				-0.004		
				(0.004)		
Year x Treatment d x HH wealth index at baseline				-0.004		
				(0.007)		
Year x Area of land possessed by HH at baseline (hectares)					-0.003	
					(0.002)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					-0.000	
					(0.003)	
Year x Distance to regional capital at baseline (km)						-0.000
						(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)						-0.000
						(0.000)
Constant	0.000	0.000	0.000	0.000	-0.000	-0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Households	989	989	989	989	988	807
R-squared	0.022	0.023	0.020	0.020	0.017	0.021

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects. Credit outcomes were not measured in the same way at baseline, so these results compare the endline to the follow-on survey, excluding treated households that were treated by endline.

Annex Table A2.3 Heterogeneous Treatment Effects: Time to Resolve Land Disputes

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	-0.619	-0.619***		-0.611**		3.158***
	(.)	(0.000)		(0.249)		(0.652)
Year x Treatment d	0.292	0.609	-1.818	0.483	2.207*	
	(0.783)	(0.553)	(1.448)	(0.574)	(1.267)	
Year x Treatment d x Female-headed HH at baseline	0.520					
	(0.900)					
Year x HH head is a widow at baseline		-1.089*				
		(0.553)				
Year x Age of HH head at baseline (years)			-0.012			
			(.)			
Year x Treatment d x Age of HH head at baseline (years)			0.055			
			(0.042)			
Year x HH wealth index at baseline				-0.013		
				(0.418)		
Year x Area of land possessed by HH at baseline (hectares)					-0.248***	
					(0.000)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					-1.155	
					(0.719)	
Year x Distance to regional capital at baseline (km)						-0.036***
						(0.006)
Year x Treatment d x Distance to regional capital at baseline (km)						0.007***
						(0.001)
Constant	2.198***	2.193***	2.151***	2.185***	2.311***	2.479***
	(0.078)	(0.059)	(0.082)	(0.080)	(0.058)	(0.055)
Households	343	343	343	343	343	250
R-squared	0.193	0.207	0.234	0.172	0.339	0.895

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.4 Heterogeneous Treatment Effects: Whether Households Experience Boundary or Encroachment Disputes

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	-0.057*	-0.056*	-0.112	-0.060***	-0.100***	-0.113***
	(0.033)	(0.033)	(0.086)	(0.018)	(0.035)	(0.043)
Year x Treatment d	0.012	0.013	0.109	0.020	0.061*	0.083*
	(0.034)	(0.034)	(0.089)	(0.020)	(0.036)	(0.045)
Year x Female-headed HH at baseline	0.033					
	(0.044)					
Year x Treatment d x Female-headed HH at baseline	-0.027					
	(0.049)					
Year x HH head is a widow at baseline		0.031				
		(0.045)				
Year x Treatment d x HH head is a widow at baseline		-0.033				
		(0.049)				
Year x Age of HH head at baseline (years)			0.001			
			(0.001)			
Year x Treatment d x Age of HH head at baseline (years)			-0.002			
			(0.001)			
Year x HH wealth index at baseline				-0.013		
				(0.033)		
Year x Treatment d x HH wealth index at baseline				0.021		
				(0.034)		
Year x Area of land possessed by HH at baseline (hectares)					0.026***	
					(0.006)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					-0.029***	
					(0.006)	
Year x Distance to regional capital at baseline (km)						0.000**
						(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)						-0.000***
						(0.000)
Constant	0.083***	0.083***	0.083***	0.083***	0.083***	0.085***
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)
Households	2267	2267	2267	2267	2265	1594
R-squared	0.022	0.022	0.024	0.023	0.050	0.032

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.5 Heterogeneous Treatment Effects: Wives Experience Boundary or Encroachment Disputes on Their Parcels

	(1) Age of Head	(2) HH Wealth Index	(3) HH Landholdings	(4) Distance to Capital
Year	0.009	0.013	0.005	-0.009
	(0.009)	(0.010)	(0.004)	(0.010)
Year x Treatment d	0.041*	0.007	0.019**	0.048***
	(0.023)	(0.012)	(0.008)	(0.015)
Year x Age of HH head at baseline (years)	-0.000			
	(0.000)			
Year x Treatment d x Age of HH head at baseline (years)	-0.001			
	(0.000)			
Year x HH wealth index at baseline		0.008		
		(0.006)		
Year x Treatment d x HH wealth index at baseline		-0.012		
		(0.008)		
Year x Area of land possessed by HH at baseline (hectares)			0.001	
			(0.001)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)			-0.002	
			(0.002)	
Year x Distance to regional capital at baseline (km)				0.000
				(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)				-0.000
				(0.000)
Constant	0.004**	0.004**	0.004**	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Households	1890	1890	1888	1299
R-squared	0.014	0.014	0.013	0.031

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.6 Heterogeneous Treatment Effects: Number of Parcels Rented Out by Households

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	0.083**	0.088**	0.043	0.127***	0.090***	0.097*
	(0.035)	(0.035)	(0.087)	(0.042)	(0.032)	(0.051)
Year x Treatment d	0.120***	0.095**	-0.452***	0.099*	0.067	0.213***
	(0.043)	(0.043)	(0.122)	(0.051)	(0.043)	(0.074)
Year x Female-headed HH at baseline	0.046					
	(0.100)					
Year x Treatment d x Female-headed HH at baseline	-0.115					
	(0.124)					
Year x HH head is a widow at baseline		0.010				
		(0.091)				
Year x Treatment d x HH head is a widow at baseline		0.056				
		(0.131)				
Year x Age of HH head at baseline (years)			0.001			
			(0.002)			
Year x Treatment d x Age of HH head at baseline (years)			0.012***			
			(0.003)			
Year x HH wealth index at baseline				0.059**		
				(0.029)		
Year x Treatment d x HH wealth index at baseline				0.014		
				(0.036)		
Year x Area of land possessed by HH at baseline (hectares)					-0.000	
					(0.005)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					0.021	
					(0.014)	
Year x Distance to regional capital at baseline (km)						-0.000
						(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)						-0.001*
						(0.000)
Constant	0.115***	0.115***	0.115***	0.115***	0.115***	0.117***
	(0.011)	(0.011)	(0.011)	(0.010)	(0.011)	(0.011)
Households	2267	2267	2267	2267	2265	1594
R-squared	0.035	0.035	0.060	0.042	0.036	0.034

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.7 Heterogeneous Treatment Effects: Land Area Rented Out by Households

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	0.039**	0.040**	0.026	0.057***	0.031**	0.028
	(0.016)	(0.016)	(0.039)	(0.021)	(0.014)	(0.028)
Year x Treatment d	0.032	0.023	-0.157**	0.015	0.006	0.104**
	(0.026)	(0.025)	(0.077)	(0.031)	(0.024)	(0.040)
Year x Female-headed HH at baseline	-0.010					
	(0.029)					
Year x Treatment d x Female-headed HH at baseline	-0.023					
	(0.046)					
Year x HH head is a widow at baseline		-0.021				
		(0.026)				
Year x Treatment d x HH head is a widow at baseline		0.038				
		(0.049)				
Year x Age of HH head at baseline (years)			0.000			
			(0.001)			
Year x Treatment d x Age of HH head at baseline (years)			0.004**			
			(0.002)			
Year x HH wealth index at baseline				0.031**		
				(0.015)		
Year x Treatment d x HH wealth index at baseline				-0.017		
				(0.021)		
Year x Area of land possessed by HH at baseline (hectares)					0.003	
					(0.005)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					0.013	
					(0.009)	
Year x Distance to regional capital at baseline (km)						0.000
						(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)						-0.001*
						(0.000)
Constant	0.053***	0.053***	0.053***	0.053***	0.053***	0.058***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)
Households	2267	2267	2267	2267	2265	1594
R-squared	0.009	0.009	0.014	0.010	0.010	0.008

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.8 Heterogeneous Treatment Effects: Whether Households Invested in Soil or Water Conservation

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	-0.075	-0.072	-0.230	-0.110	-0.212**	-0.034
	(0.071)	(0.071)	(0.192)	(0.074)	(0.098)	(0.123)
Year x Treatment d	0.054	0.059	0.309	0.097	0.223**	-0.087
	(0.073)	(0.073)	(0.197)	(0.077)	(0.101)	(0.128)
Year x Female-headed HH at baseline	-0.401					
	(0.282)					
Year x Treatment d x Female-headed HH at baseline	0.464					
	(0.283)					
Year x HH head is a widow at baseline		-0.445				
		(0.277)				
Year x Treatment d x HH head is a widow at baseline		0.468*				
		(0.280)				
Year x Age of HH head at baseline (years)			0.002			
			(0.003)			
Year x Treatment d x Age of HH head at baseline (years)			-0.004			
			(0.003)			
Year x HH wealth index at baseline				0.041		
				(0.061)		
Year x Treatment d x HH wealth index at baseline				-0.045		
				(0.062)		
Year x Area of land possessed by HH at baseline (hectares)					0.041***	
					(0.007)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					-0.054***	
					(0.011)	
Year x Distance to regional capital at baseline (km)						-0.001
						(0.001)
Year x Treatment d x Distance to regional capital at baseline (km)						0.002
						(0.001)
Constant	0.402***	0.402***	0.402***	0.402***	0.402***	0.385***
	(0.017)	(0.017)	(0.020)	(0.019)	(0.019)	(0.023)
Households	2267	2267	2267	2267	2265	1594
R-squared	0.042	0.045	0.022	0.022	0.039	0.045

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.9 Heterogeneous Treatment Effects: Whether Households Expect they Can Bequeath Land

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	0.600***	0.599***	0.385	0.681***	0.534***	0.615***
	(0.103)	(0.102)	(0.358)	(0.045)	(0.104)	(0.162)
Year x Treatment d	-0.029	-0.033	0.228	-0.105**	0.029	-0.113
	(0.102)	(0.101)	(0.359)	(0.049)	(0.104)	(0.164)
Year x Female-headed HH at baseline	-0.258					
	(0.211)					
Year x Treatment d x Female-headed HH at baseline	0.282					
	(0.217)					
Year x HH head is a widow at baseline		-0.262				
		(0.218)				
Year x Treatment d x HH head is a widow at baseline		0.335				
		(0.225)				
Year x Age of HH head at baseline (years)			0.004			
			(0.008)			
Year x Treatment d x Age of HH head at baseline (years)			-0.005			
			(0.008)			
Year x HH wealth index at baseline				0.190***		
				(0.068)		
Year x Treatment d x HH wealth index at baseline				-0.188***		
				(0.069)		
Year x Area of land possessed by HH at baseline (hectares)					0.015	
					(0.010)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					-0.007	
					(0.011)	
Year x Distance to regional capital at baseline (km)						-0.000
						(0.001)
Year x Treatment d x Distance to regional capital at baseline (km)						0.001
						(0.001)
Constant	0.366***	0.366***	0.366***	0.366***	0.366***	0.384***
	(0.022)	(0.022)	(0.022)	(0.018)	(0.022)	(0.028)
Households	2267	2267	2267	2267	2265	1594
R-squared	0.531	0.531	0.528	0.556	0.527	0.505

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.10 Heterogeneous Treatment Effects: Whether Households Expect a Land Redistribution

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	-0.016	-0.017	-0.149	-0.093*	-0.112	0.094
	(0.062)	(0.061)	(0.272)	(0.053)	(0.099)	(0.125)
Year x Treatment d	-0.130**	-0.131**	0.023	-0.047	-0.039	-0.236*
	(0.062)	(0.062)	(0.279)	(0.056)	(0.102)	(0.130)
Year x Female-headed HH at baseline	-0.525**					
	(0.254)					
Year x Treatment d x Female-headed HH at baseline	0.527**					
	(0.261)					
Year x HH head is a widow at baseline		-0.552**				
		(0.256)				
Year x Treatment d x HH head is a widow at baseline		0.568**				
		(0.259)				
Year x Age of HH head at baseline (years)			0.001			
			(0.005)			
Year x Treatment d x Age of HH head at baseline (years)			-0.002			
			(0.005)			
Year x HH wealth index at baseline				0.004		
				(0.069)		
Year x Treatment d x HH wealth index at baseline				0.008		
				(0.072)		
Year x Area of land possessed by HH at baseline (hectares)					0.009	
					(0.008)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					-0.005	
					(0.010)	
Year x Distance to regional capital at baseline (km)						-0.001
						(0.001)
Year x Treatment d x Distance to regional capital at baseline (km)						0.001
						(0.001)
Constant	0.253***	0.253***	0.253***	0.253***	0.253***	0.264***
	(0.014)	(0.014)	(0.018)	(0.019)	(0.019)	(0.021)
Households	2267	2267	2267	2267	2265	1594
R-squared	0.095	0.098	0.052	0.051	0.052	0.075

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.11 Heterogeneous Treatment Effects: Whether Households Feels More Secure in Credit-Based Transactions with Certificate Holder

	(1) Female-Headed HH	(2) HH Head is a Widow	(3) Age of Head	(4) HH Wealth Index	(5) HH Landholdings	(6) Distance to Capital
Year	0.047	0.048	0.044	0.035	0.028	-0.052
	(0.050)	(0.050)	(0.067)	(0.037)	(0.043)	(0.072)
Year x Treatment d	0.054	0.053	0.006	0.069*	0.054	0.115
	(0.052)	(0.051)	(0.077)	(0.038)	(0.045)	(0.076)
Year x Female-headed HH at baseline	0.011					
	(0.062)					
Year x Treatment d x Female-headed HH at baseline	-0.013					
	(0.067)					
Year x HH head is a widow at baseline		0.008				
		(0.063)				
Year x Treatment d x HH head is a widow at baseline		-0.014				
		(0.069)				
Year x Age of HH head at baseline (years)			0.000			
			(0.002)			
Year x Treatment d x Age of HH head at baseline (years)			0.001			
			(0.002)			
Year x HH wealth index at baseline				-0.021		
				(0.030)		
Year x Treatment d x HH wealth index at baseline				0.030		
				(0.033)		
Year x Area of land possessed by HH at baseline (hectares)					0.011*	
					(0.006)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)					-0.000	
					(0.006)	
Year x Distance to regional capital at baseline (km)						0.001*
						(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)						-0.000
						(0.000)
Constant	0.851***	0.851***	0.851***	0.851***	0.851***	0.873***
	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.012)
Households	2267	2267	2267	2267	2265	1594
R-squared	0.039	0.039	0.039	0.040	0.043	0.063

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

Annex Table A2.12 Heterogeneous Treatment Effects: Whether Wives Possess Land in Their Names

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	0.281**	-0.235	0.459***	0.359***	0.106
	(0.115)	(0.243)	(0.087)	(0.104)	(0.146)
Year x Treatment d	0.149	0.725***	-0.008	0.086	0.034
	(0.114)	(0.240)	(0.090)	(0.104)	(0.151)
Year x Polygynous HH at baseline (%)	0.636***				
	(0.135)				
Year x Treatment d x Polygynous HH at baseline (%)	-0.335**				
	(0.149)				
Year x Age of HH head at baseline (years)		0.014***			
		(0.004)			
Year x Treatment d x Age of HH head at baseline (years)		-0.015***			
		(0.004)			
Year x HH wealth index at baseline			0.017		
			(0.072)		
Year x Treatment d x HH wealth index at baseline			-0.039		
			(0.071)		
Year x Area of land possessed by HH at baseline (hectares)				0.033***	
				(0.012)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				-0.024**	
				(0.011)	
Year x Distance to regional capital at baseline (km)					0.002***
					(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)					-0.001**
					(0.000)
Constant	0.477***	0.477***	0.477***	0.477***	0.557***
	(0.020)	(0.021)	(0.022)	(0.020)	(0.024)
Wives	1890	1890	1890	1888	1299
R-squared	0.442	0.429	0.374	0.394	0.357

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.13 Heterogeneous Treatment Effects: Whether Wives Have Certificates for Their Land

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	0.498***	0.428**	0.507***	0.491***	0.492***
	(0.089)	(0.198)	(0.082)	(0.081)	(0.115)
Year x Treatment d	0.215**	0.253	0.192**	0.213**	0.237**
	(0.089)	(0.202)	(0.081)	(0.082)	(0.116)
Year x Polygynous HH at baseline (%)	-0.090				
	(0.094)				
Year x Treatment d x Polygynous HH at baseline (%)	-0.060				
	(0.116)				
Year x Age of HH head at baseline (years)		0.001			
		(0.003)			
Year x Treatment d x Age of HH head at baseline (years)		-0.001			
		(0.003)			
Year x HH wealth index at baseline			0.045		
			(0.039)		
Year x Treatment d x HH wealth index at baseline			-0.045		
			(0.043)		
Year x Area of land possessed by HH at baseline (hectares)				-0.006	
				(0.006)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				0.003	
				(0.013)	
Year x Distance to regional capital at baseline (km)					-0.000
					(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)					-0.000
					(0.000)
Constant	0.051***	0.051***	0.051***	0.051***	0.062***
	(0.016)	(0.015)	(0.015)	(0.015)	(0.019)
Wives	1890	1890	1890	1888	1299
R-squared	0.610	0.607	0.609	0.608	0.582

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.14 Heterogeneous Treatment Effects: Whether Wives Decide What Crops to Grow on Their Land, Self-Reported

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	0.642***	0.954***	0.574***	0.501***	0.512***
	(0.068)	(0.253)	(0.063)	(0.074)	(0.135)
Year x Treatment d	-0.030	-0.282	0.028	0.113	0.196
	(0.070)	(0.255)	(0.066)	(0.079)	(0.143)
Year x Polygynous HH at baseline (%)	at baseline				
	(0.183)				
Year x Treatment d x Polygynous HH (%)	0.350*				
	(0.182)				
Year x Age of HH head at baseline (years)		-0.009*			
		(0.005)			
Year x Treatment d x Age of HH head at baseline (years)		0.007			
		(0.005)			
Year x HH wealth index at baseline			0.055		
			(0.069)		
Year x Treatment d x HH wealth index at baseline			-0.065		
			(0.071)		
Year x Area of land possessed by HH at baseline (hectares)				0.013	
				(0.010)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				-0.017	
				(0.017)	
Year x Distance to regional capital at baseline (km)					0.000
					(0.001)
Year x Treatment d x Distance to regional capital at baseline (km)					-0.001
					(0.001)
Constant	0.047***	0.047***	0.047***	0.047***	0.051***
	(0.015)	(0.014)	(0.015)	(0.015)	(0.020)
Wives	1890	1890	1890	1888	1299
R-squared	0.570	0.566	0.550	0.550	0.548

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.15 Heterogeneous Treatment Effects: Whether Wives Decide What Crops to Grow on Their Land, Reported by Household Head

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	0.186	-0.015	0.240**	0.334**	0.260
	(0.114)	(0.207)	(0.116)	(0.131)	(0.195)
Year x Treatment d	0.073	0.240	0.036	-0.076	-0.055
	(0.116)	(0.218)	(0.118)	(0.134)	(0.201)
Year x Polygynous HH at baseline (%)	0.516**				
	(0.233)				
Year x Treatment d x Polygynous HH at baseline (%)	-0.447*				
	(0.234)				
Year x Age of HH head at baseline (years)		0.007**			
		(0.004)			
Year x Treatment d x Age of HH head at baseline (years)		-0.006			
		(0.004)			
Year x HH wealth index at baseline			-0.115**		
			(0.054)		
Year x Treatment d x HH wealth index at baseline			0.137**		
			(0.057)		
Year x Area of land possessed by HH at baseline (hectares)				-0.005	
				(0.015)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				0.009	
				(0.010)	
Year x Distance to regional capital at baseline (km)					0.000
					(0.001)
Year x Treatment d x Distance to regional capital at baseline (km)					-0.000
					(0.001)
Constant	0.469***	0.469***	0.469***	0.470***	0.494***
	(0.021)	(0.021)	(0.021)	(0.024)	(0.031)
Wives	1890	1890	1890	1888	1299
R-squared	0.191	0.164	0.165	0.151	0.141

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.16 Heterogeneous Treatment Effects: Certification on Whether Wives Decide Whether to Rent Out Their Land, Self-Reported

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	0.228***	0.357**	0.173***	0.174**	0.260**
	(0.073)	(0.166)	(0.044)	(0.075)	(0.124)
Year x Treatment d	0.203***	0.012	0.259***	0.246***	0.314**
	(0.077)	(0.175)	(0.052)	(0.085)	(0.138)
Year x Polygynous HH at baseline (%)	-0.130				
	(0.094)				
Year x Treatment d x Polygynous HH at baseline (%)	-0.090				
	(0.108)				
Year x Age of HH head at baseline (years)		-0.003			
		(0.002)			
Year x Treatment d x Age of HH head at baseline (years)		0.004			
		(0.003)			
Year x HH wealth index at baseline			-0.029		
			(0.047)		
Year x Treatment d x HH wealth index at baseline			0.081		
			(0.051)		
Year x Area of land possessed by HH at baseline (hectares)				0.006	
				(0.006)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				-0.013	
				(0.016)	
Year x Distance to regional capital at baseline (km)					-0.001
					(0.000)
Year x Treatment d x Distance to regional capital at baseline (km)					-0.000
					(0.001)
Constant	0.012	0.012	0.012	0.012	0.013
	(0.013)	(0.012)	(0.014)	(0.014)	(0.017)
Wives	1890	1890	1890	1888	1299
R-squared	0.364	0.358	0.360	0.353	0.409

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.17 Heterogeneous Treatment Effects: Whether Wives Decide Whether to Rent Out Their Land, Reported by Household Head

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	0.088	-0.194	0.115	0.148	0.268
	(0.093)	(0.284)	(0.111)	(0.120)	(0.177)
Year x Treatment d	0.093	0.398	0.074	0.007	-0.160
	(0.096)	(0.288)	(0.114)	(0.124)	(0.184)
Year x Polygynous HH at baseline (%)	0.219				
	(0.372)				
Year x Treatment d x Polygynous HH at baseline (%)	-0.115				
	(0.378)				
Year x Age of HH head at baseline (years)		0.007			
		(0.006)			
Year x Treatment d x Age of HH head at baseline (years)		-0.007			
		(0.006)			
Year x HH wealth index at baseline			-0.043		
			(0.061)		
Year x Treatment d x HH wealth index at baseline			0.038		
			(0.063)		
Year x Area of land possessed by HH at baseline (hectares)				-0.001	
				(0.011)	
Year x Treatment d x Area of land possessed by at baseline (hectares)				0.022	
				(0.014)	
Year x Distance to regional capital at baseline (km)					-0.001
					(0.001)
Year x Treatment d x Distance to regional capital at baseline (km)					0.001
					(0.001)
Constant	0.609***	0.609***	0.609***	0.609***	0.646***
	(0.023)	(0.021)	(0.022)	(0.023)	(0.028)
Wives	1890	1890	1890	1888	1299
R-squared	0.077	0.084	0.069	0.069	0.057

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.18 Heterogeneous Treatment Effects: Number of Parcels Wives Own Solely or Jointly

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	1.698***	0.772	2.138***	1.448***	0.936
	(0.594)	(0.924)	(0.402)	(0.471)	(0.699)
Year x Treatment d	0.950	2.184**	0.640	0.824*	0.617
	(0.591)	(0.974)	(0.408)	(0.482)	(0.705)
Year x Polygynous HH at baseline (%)	0.461				
	(0.602)				
Year x Treatment d x Polygynous HH at baseline (%)	0.177				
	(0.665)				
Year x Age of HH head at baseline (years)		0.022			
		(0.017)			
Year x Treatment d x Age of HH head at baseline (years)		-0.027			
		(0.019)			
Year x HH wealth index at baseline			0.458		
			(0.287)		
Year x Treatment d x HH wealth index at baseline			-0.303		
			(0.308)		
Year x Area of land possessed by HH at baseline (hectares)				0.139***	
				(0.033)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				0.113	
				(0.127)	
Year x Distance to regional capital at baseline (km)					0.006*
					(0.003)
Year x Treatment d x Distance to regional capital at baseline (km)					-0.000
					(0.003)
Constant	1.366***	1.366***	1.366***	1.367***	1.572***
	(0.110)	(0.115)	(0.106)	(0.098)	(0.119)
Wives	1890	1890	1890	1888	1299
R-squared	0.332	0.335	0.338	0.350	0.298

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.19 Heterogeneous Treatment Effects: Number of Parcels Wives Own Solely

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	0.810***	0.780**	0.800***	0.543**	0.413
	(0.257)	(0.371)	(0.237)	(0.245)	(0.387)
Year x Treatment d	0.033	0.131	0.094	0.110	0.116
	(0.255)	(0.399)	(0.233)	(0.256)	(0.379)
Year x Polygynous HH at baseline (%)	-0.356				
	(0.287)				
Year x Treatment d x Polygynous HH at baseline (%)	0.841***				
	(0.319)				
Year x Age of HH head at baseline (years)		-0.001			
		(0.008)			
Year x Treatment d x Age of HH head at baseline (years)		0.001			
		(0.008)			
Year x HH wealth index at baseline			0.119		
			(0.103)		
Year x Treatment d x HH wealth index at baseline			-0.111		
			(0.123)		
Year x Area of land possessed by HH at baseline (hectares)				0.066***	
				(0.009)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				0.072	
				(0.070)	
Year x Distance to regional capital at baseline (km)					0.002
					(0.002)
Year x Treatment d x Distance to regional capital at baseline (km)					0.000
					(0.002)
Constant	0.062	0.062	0.062	0.062	0.053
	(0.057)	(0.059)	(0.058)	(0.053)	(0.067)
Wives	1890	1890	1890	1888	1299
R-squared	0.220	0.213	0.216	0.240	0.227

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.20 Heterogeneous Treatment Effects: Land Area Wives Own Solely or Jointly

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	1.101***	1.398	1.573***	0.196	-1.414**
	(0.397)	(1.143)	(0.529)	(0.410)	(0.677)
Year x Treatment d	0.018	-0.155	-0.310	0.542	1.372**
	(0.379)	(1.089)	(0.468)	(0.418)	(0.592)
Year x Polygynous HH at baseline (%)	2.929				
	(2.065)				
Year x Treatment d x Polygynous HH at baseline (%)	-1.521				
	(1.971)				
Year x Age of HH head at baseline (years)		0.010			
		(0.022)			
Year x Treatment d x Age of HH head at baseline (years)		-0.009			
		(0.022)			
Year x HH wealth index at baseline			-0.417		
			(0.525)		
Year x Treatment d x HH wealth index at baseline			0.427		
			(0.533)		
Year x Area of land possessed by HH at baseline (hectares)				0.629***	
				(0.014)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				-0.327***	
				(0.084)	
Year x Distance to regional capital at baseline (km)					0.024***
					(0.006)
Year x Treatment d x Distance to regional capital at baseline (km)					-0.016***
					(0.004)
Constant	0.613***	0.613***	0.613***	0.613***	0.715***
	(0.180)	(0.185)	(0.185)	(0.090)	(0.118)
Wives	1890	1890	1890	1888	1299
R-squared	0.268	0.201	0.208	0.555	0.474

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

Annex Table A2.21 Heterogeneous Treatment Effects: Land Area Wives Own Solely

	(1) Polygynous HH	(2) Age of Head	(3) HH Wealth Index	(4) HH Landholdings	(5) Distance to Capital
Year	0.497***	0.734	0.586**	-0.097	-0.553
	(0.163)	(0.487)	(0.255)	(0.154)	(0.407)
Year x Treatment d	-0.093	-0.282	-0.118	0.290*	0.460
	(0.154)	(0.457)	(0.223)	(0.174)	(0.355)
Year x Polygynous HH at baseline (%)	0.863				
	(1.088)				
Year x Treatment d x Polygynous HH at baseline (%)	-0.143				
	(1.026)				
Year x Age of HH head at baseline (years)		-0.000			
		(0.008)			
Year x Treatment d x Age of HH head at baseline (years)		0.001			
		(0.008)			
Year x HH wealth index at baseline			-0.194		
			(0.235)		
Year x Treatment d x HH wealth index at baseline			0.177		
			(0.244)		
Year x Area of land possessed by HH at baseline (hectares)				0.308***	
				(0.006)	
Year x Treatment d x Area of land possessed by HH at baseline (hectares)				-0.144***	
				(0.054)	
Year x Distance to regional capital at baseline (km)					0.009**
					(0.004)
Year x Treatment d x Distance to regional capital at baseline (km)					-0.005
					(0.004)
Constant	0.037	0.037	0.037	0.037	0.033
	(0.087)	(0.088)	(0.089)	(0.037)	(0.072)
Wives	1890	1890	1890	1888	1299
R-squared	0.169	0.136	0.144	0.533	0.347

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

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Appendix 9. Head of Household Survey

EconInsights and Landesa

Impact Evaluation of Land Certification in Four Regions in Ethiopia Endline Household Survey

A1.	Household ID **(hh_id)**	(Integer)	
A2.	Interviewer's Code	(Integer)	
A3.	Kebele (name of selected kebele) **(PII)**		
A4.	Region **(killil)**	*Tigray =1* *Amhara =2* *Oromia = 3* *SNNP = 4* *Sidma =5*	(Code)
A5.	Zone **(zone)**		(Code)
A6.	Woreda **(woreda)** **Probe : Use Old administrative structure**		(Code)
	Name of the village (gox) **(PII)**		
	Location coordinates: Latitude **(PII)**		
	Location coordinates: Longitude **(PII)**		

Enumerator Note:

- *(interview only household head in in the tracking sheet).*
- *In this questionnaire "during the last 24 months=Last two years" refers to the time period from Yekatit 2011 to Tir 2013 in the Ethiopian Calendar and 'during last year=last 12 months' refers to the period from Yekatit 2012 to Tir 2013 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 If 'Yes' do not ask THIS QUESTION for any additional members*	Sex *Male =1 Female = 2 Prefer not to respond = 3*	Age *In whole years (if age is 99 and above fill in 99)*	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	What TYPE of family is this household? **(type_hh)** *Enumerator: Probe and code accordingly to match*	*Monogamous = 1* *Polygamy type 'A' = 2* *Polygamy type 'B' = 3* *Polygamy type 'C' =4* *Polygamy type 'D' = 5* *Female-headed household = 6* *Non-married male-headed household = 7*	(Code)
	If sexhead=2 enter code=6 and STOP 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 Q - Do all of the wives live in the same house? -> if 'yes' code=2 and STOP Q - Do wives live in separate houses but share household food and land resources? -> if 'yes' code=3 and STOP Q - Do wives live in different kebeles? -> if 'yes' code=5 and STOP otherwise enter code=4		
	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.		

2. Land Possession and Land Use

Household Land Parcel Roster

Enumerator: ask the interviewee about the land in the roster. Read the name, the area and distance to the parcel. If yes, then, ask all the questions until 2.17b.
Then add any new parcel to the roster. Ask all the questions about the new parcel (s).

Parcel	Name of the place where the parcel is found. *Text description of where parcel is located*	Area of parcel in local units *(no.)*	Name local area unit *(see codes)*	Distance from homestead to parcel ONE-WAY and direction of parcel from homestead		How was it originally acquired? *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)*	When was it acquired? *(year in EC)*	Who possesses the parcel? *(see codes)*	Who decides on the crop (s) to grow? *(see codes)*	Who decides on the use of produce from the land? *(see codes)*	Who decides on the transfer (rent/sharecropping-OUT) to others? *(see codes)*
				Time to walk ONE-WAY *(in minutes)*	Walking distance ONE-WAY *(in meters)*						
	(PII)	**2.02**	**2.03**	**2.04a**	**2.04b**	**2.05**	**2.06**	**2.07**	**2.08**	**2.09**	**2.10**
	(PII)	**parclu_2**	**parclunm_2**	**parcmin**	**parcdist**	**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)**

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* *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)*

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 2012 to Tir 2013 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 *If '0' skip to (pecra)*	Unit *(see codes)*	Area in local units *If '0' skip to (gdcra)*	Unit *(see codes)*	Area in local units *If '0' skip to (ownpa)*	Unit *(see codes)*	Area in local units *If '0' skip to (mmta)*	Unit *(see codes)*	Area in local units *If '0' skip to (ngpta)*	Unit *(see codes)*	Area in local units *If '0' skip to (falla)*	Unit *(see codes)*	Area in local units *If '0' skip to Next parcel*	Unit *(see codes)*
	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)**	*Yes = 1* *No = 0*	(Code)
2.19	Does your household use a COMMON pastureland? **(cpasl)**	*Yes = 1* *No = 0*	(Code)

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	

3. Land registration and certification

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* *If 'No' skip to next parcel*	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 2nd level certificate/book of holding)				Regardless of the certificate type, whose name is in it?	When you received the certificate, where you offered any of the following services?
		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* *If 'No' skip to parc 1*	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)*	*(See codes)*	*(choose all the appropriate answers)* 1=credit from an NGO 2=credit from a bank 3=credit from other financial institution other than an NGO, not an individual. 4= any agricultural training 5=training about forestry 6=training about women rights 7=training about other topics 8=seeds or seedlings. Other= specify
	3.1	**3.2**	**3.3**	**3.4**	**3.5**	**3.6**	**3.7**	**3.8**	**3.9**	**3.10**	**3.11**	**3.12**	**3.13**
	parcreg	**parcb1**	**parc1yr**	**parc1who**	**parc1jver**	**parc2sur**	**parc2suryr**	**parc2cer**	**parc2yr**	**parc2who**	**parc2jver**	**parcertname**	**Parcotherserv**
1													
2													
3													
4													
5													

Possession and decision response codes **(parc1who, parc2who,parcertname)**	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*

3.2 Changes in household land holding since Genbot 2008 in Ethiopian Calendar (May 2015 in Western calendar)

Enumerator: The next set of questions involves INCREASES in household land holding (i.e., an INCREASE in the number of parcels) since Genbot 2008 in Ethiopian Calendar. NOTE: this is only changes in ownership, this does NOT include land that is rented-IN or instances of other temporarily using the land)

HOUSEHOLD LAND PARCEL ROSTER (Continued)	*Enumerator: is* **[parcwhn]** *greater than Genbot 2008?* *Yes =1* *No= 0* *if 'No' skip to next parcel*	Were steps taken to update this formally with the land administration office?						
		Yes =1 *No = 0* *if 'No' skip to next parcel*	When were the first steps taken? *(Year in EC)*	Where did you go to update this change? *1=Woreda* *2=Kebele*	Has the change been registered/formally recorded in the registry and reflected in your household's certificate of land holding?			
					Yes =1 *No = 0* *if 'No' skip to parcel div*	When? *(Year in EC)*	Number of round-trips to the land admin. Office? *(number of round trips)*	What was the average number of hours you had to wait at the land admin. office each visit? *(number of hours - can be fraction)*
	3.21	**3.22**	**3.23**	**3.24**	**3.25**	**3.26**	**3.27**	**3.28**
	Pin	**pinreg**	**pinregyr**	**pinregwh**	**Pinrec**	**pinrecyr**	**pinrect**	**pinwait**
1								
2								
3								
4								
5								

6								
7								

3.3 Reductions in household land holdings

Enumerator: This set of questions involves DECREASES in household land holdings SINCE Genbot 2008 in Ethiopian Calendar (May 2015 in Western calendar):

3.31	Has there been a decrease in your household land holdings since Genbot 2008 in Ethiopian Calendar (2015 in Gregorian)? **(ldic)**	*Yes =1* *No = 0* *If 'No' skip to Section 4*	(Code)
3.32	Why did your land decrease?	*Official land redistribution (redland) =1* *Gift to non-household members (giftland)= 2* *Expropriated, taken (lland)=3* *Other reasons(otherllost)=4*	(Code)
3.33a	If yes, when?	Year of most recent **(land_lost_yr1)**	(Integer)
3.33b		Year of second most recent **(land_lost_yr2)**	(Integer)
3.34	For the most recent instance, have you taken steps to update this formally at the land administration office? **(lostland_reg)**	*Yes =1* *No = 0* *if 'No' skip to (lland)*	(Code)
3.35	If yes, when? Year in EC **(lostland_regyr)**		(Integer)
3.36	How many trips to the land administration office were necessary to register the change? (number of round trips for the most recent gift) **(lostlandt)**		(Integer)

4. Engagement in Land Rental/Sharecropping Activities

Local area measurement unit codes **(poutlunm)**	
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	*110 = Other (specify)*

4.1 Household Land Rented-OUT

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 2012 to Tir 2013 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)

Parcel	In the past year, has part or all of parcel **[parc_id]** been rented / shared-OUT? *Yes =1* *No = 0* *If 'No' skip to next parcel*	Is the total area of this parcel as reported [in the land roster] being rented / shared-OUT? *Yes =1* *No = 0* *if 'No' skip to poutsp*	Area of parcel in local units	Name local area unit (see codes below)	With whom has your household entered into an agreement of land renting/sharing- OUT? *A relative = 1 A close friend = 2 A person/ household that is neither relative nor a friend = 3 Others (specify) = 97*	Why does your household rent- out/share-out its land? *Shortage of labor=1* *Shortage of draft power=2* *Unable to purchase inputs (fertilizer, improved seeds)=3* *Renting/sharecropping yields better benefit=4* *Lack of credit/cash shortage =5* *Engagement in non-farm sector/migration = 6 Others (specify)=97* (Indicate up to three reasons.)		
						Reason 1	Reason 2	Reason 3
	4.02	**4.03**	**4.04**	**4.05**	**4.06**	**4.07a**	**4.07b**	**4.07c**

	pout	**Poutsame**	**poutlu**	**poutlunm**	**poutwho**	**poutra**	**Poutrb**	**Poutrc**
1								
2								
3								
4								
5								

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 2010 to Tir 2013 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? *Yes =1* *No = 0*	Area of parcel in local units	Name local area unit *(see codes)*	Has the household rented- OUT parcel [parcid] on the basis of monetary rent payment or sharecropping in kind during the last 24 calendar months? *Yes =1* *No = 0* *If 'No' skip to next parcel*	Is the total area of this parcel as reported [in the land roster] being rented / shared-OUT during the last 24 calendar months? *Yes =1* *No = 0* *if 'Yes' skip to next parcel*	Area of parcel in local units	Name local area unit *(see codes)*
	4.08	**4.09a**	**4.09b**	**4.10**	**4.11**	**4.12a**	**4.12b**
	Trpltout	**trpoutarea**	**trpoutlub**	**Poutmon**	**poutrost**	**poutarea**	**poutlub**
1							
2							
3							
4							
5							

Local area measurement unit codes **(parclu)**	
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*

Enumerator: This is a continuation of previous page on renting-OUT/sharecropped-OUT land owned by the household and refers to renting-OUT land owned by the household IN THE LAST 2 YEARS (i.e. the time period from Yekatit 2010 to Tir 2013 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/sharecropped-out in the previous table (pout=1) should also be indicated as being rented-OUT here.

	For how many years is this renting-OUT arrangement? *(indicate number of years of the agreement, if no fixed term enter '99')*	What is the type of contract? *Written = 1* *Oral with witness = 2* *Oral without witness = 3* *Other (specify) = 4*	Is the contract registered with the land administration office? *Yes =1* *No = 0*	How much did your household receive in payment for the land rented- OUT during the last 12 months? (Note: this is only the payment covering the period from Yekatit 2012 to Tir 2013 in the Ethiopian Calendar)				
				Cash/In-kind			Sharecropping	
				Monetary payment	In-kind payment		Percentage of production received Ask if poutar=2	Estimated value of production received (Birr - est value)
				Birr	*Descr.*	*(Birr - est value)*		
	4.13	**4.14**	**4.15**	**4.16a**	**4.16b**	**4.16c**	**4.17**	**4.18**
	poutyrs	**pouttype**	**poutreg**	**pout12b**	**pout12d**	**pout12ik**	**poutper**	**Poutv**
1								
2								
3								
4								
5								

4.2 Land rented-IN by the household

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

4.2.1	Has your household rented/shared-IN land IN THE PAST SEASON? **(rentin2)**	*Yes =1; No = 0*	(Code)

Rent IN Parcel	What is the area of the parcel rented/ shared? *(In local units)*	Name local area unit *(see codes below)*	Where is/are the HH(s)/individual(s) from whom your HH rented/shared-IN? *same gott =1 same Kebele= 2 same Woreda = 3 same Zone = 4 same Region = 5 outside of the Region = 6* *(* enumerator: indicate the lowest applicable administrative unit)*	With whom has your household entered into an agreement of land renting/sharing- IN? *A relative = 1 A close friend = 2 A person/household that is neither relative nor a friend = 3 Others (specify) = 4*	Why does your household rent-IN/share-IN land? *Shortage of land=1 Excess labor=2 As swap for a distant parcel= 3 Others (specify)=4* *(Indicate up to three reasons.)*		
					Reason 1	Reason 2	Reason 3
4.2.2	**4.2.3**	**4.2.4**	**4.2.5**	**4.2.6**	**4.2.7a**	**4.2.7b**	**4.2.7c**
	prina	**prinlu**	**prinloc**	**prinwho**	**preason1**	**prinr2**	**printr3**
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? *(indicate number of years of the agreement, if no fixed term enter '99')*	What is the type of contract? *Written = 1* *Oral with witness = 2 Oral without witness = 3* *Other (specify) = 97*	Is the contract registered with the land administration? *Yes =1* *No = 0*	What is the type of arrangement? *Cash/ In-kind= 1* *Sharecropping = 2*
	4.2.8	**4.2.9**	**4.2.10**	**4.2.11**
	prinyrs	**Printype**	**prinreg**	**Prinr**
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? **(prinltlease2)**	*Yes =1* *No = 0*

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 2012 to Tir 2013 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**
	rancra	**rancrau**	**rpecra**	**rpecrau**	**rgdcra**	**rgdcrau**	**Rownpa**	**rownpau**	**rmmta**	**rmmtau**	**rngpta**	**rngptau**	**Rfalla**	**rfallau**
101														
102														
103														
104														

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*

5. Land Related Disputes

Enumerator: This set of questions is in regard to any disputes you may have had over land during LAST 2 YEARS (i.e. the time period from Yekatit 2010 to Tir 2013 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)

** 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**							Have you been involved in any other land related disagreements? *Yes =1* *No = 0*	**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		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 dispres=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																
4																
5																

Type of disagreement codes **(disp1, disp2)**	Disagreement resolution method codes **(disp1how, disp2how, disp1ref, disp2ref)**	Degree of seriousness codes **(disp1s, disp2s)**
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 arises from exchange of parcels of land 6= Conflict that arises in relation to access to road 7= Conflict that arises in relation to water (flood) transfer 8= Sharecropping and rental matters 9= Others (specify)	*1= Formal court 2= Shimagele, i.e., Elders council 3= Family's, relatives' or kin-group's internal mechanism 4= kebele administration 5=woreda administration 6= Others (specify) 7= Not referred*	*1= Very serious 2= Serious 3= Somewhat serious 4= Not serious*

6. Credit Secured Using Land

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 2010 to Tir 2013 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)

The next set of questions refers to up to the 6 MOST RECENT instances of credit obtained.

Credit Rank	From who was credit obtained? *Microfinance institution= 1 Bank=2 Individual= 3 Savings and Credit Association =4 Others (specify)=5*	What type of type of credit agreement is this? *1=Written 2=Oral with witness 3=Oral without witness*	When was this credit obtained (the month and year when the agreement was reached)		Did you use any form of land certificate to help secure this credit? *Yes =1 No =0*	What type of certificate was used? *1=First level 2=Second level 3= Both first and second level*	How much credit was obtained? *(amount in Birr)*	What is the length of time before you must repay? *(no. of months)*	Is the creditor (i.e. [creditwho]) holding your land certificate for this credit? *Yes =1 No = Skip if credlc= No*	What will happen if you are unable to repay? 1= *I will have to borrow more money from other sources 2=I will not be able to access credit at this institution in the future 3= I will lose my land certificate 4=Nothing 5=I do not know 6=Other*
			Month	Year						
	6.02	**6.03**	**6.04a**	**6.04b**	**6.05**	**6.06**	**6.07**	**6.08**	**6.09**	**6.10**
	credwho	**credform**	**credmonth**	**credyr**	**credlc**	**credlcty**	**credamt**	**credmo**	**credhold**	**creddef**
1										
2										
3										
4										

7. Awareness of Land rights

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

7. 01	When did the process of land registration and title certification begin in your kebele for the most recent program? **(hiklcertyr)**	*Use Ethiopian CalanderI have no idea about this = 888*	(Code)
7. 02	Did you participate in any kebele meetings that discussed the process of land certification in your kebele? **(h1lcertm)**	*Yes=1 No= 0 I have no idea about this =*	(Code)
7. 03	If yes, when did you first participate in the kebele meetings that discussed the process of land certification in your kebele? **(h1lcertmyr)**	*888year in EC*	(Numeric)
7. 04	Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? **(h1survpres)**	*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*	(Code)

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

7.05	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***.**	*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 parcel they contributed to the marriage = 3* *The wife will retain all the parcels under the HH possession = 4* *I do not know = 888*	(Code)
7.06	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.*	*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)=97 I do not know =888*	(Code)

7.2 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, does the law allow you to …? *(check boxes as appropriate)*						
	Can you use this parcel?	Can you make a contract, for example, rent it or share-out This parcel?	Can you bequest it to some one?	Can you sell this parcel if you want to?	Can you use it as a collateral to get a loan?	I do not know my right	Others (specify)
	7.2.1a	**7.2.2**	**7.2.3**	**7.2.4**	**7.2.5**	**7.2.6**	**7.2.7**
	parcr use	**Porcrout**	**Parcrher**	**parcrsel**	**parcrcol**	**Parcrunk**	**parcoth**
1							
2							
3							
4							
5							

7.3 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)
	7.31a	**7.31b**	**7.31c**	**7.31d**	**7.31e**	**7.31f**
	parc_fusea	**parc_fuseb**	**parc_fusec**	**parc_fused**	**parc_fusee**	**parc_fusef**
1						
2						
3						
4						

7.4 Perceptions of Tenure Security

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.

7.4.1	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)
7.4.2	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)
7.4.3	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)
7.4.4	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)
7.4.5	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)
7.4.6	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)
7.4.7	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)
7.4.8	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)

7.5. Perception about certificates

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

	7.5.1	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)
	7.5.2	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)
7.5.3 a-e	How do you perceive/see the effect of land certification on women? **(certpercw)** *Enumerator: Read responses, probe and code selecting all that apply.*	*It enhances women's bargaining power within the household* **(certpercw1a)**	*Yes=1,* *No=0*	(Code)
		It brings economic independence to women **(certpercw2a)**	*Yes=1,* *No=0*	(Code)
		Other perceived effects? **(certpercw3a)**	*Yes=1,* *No=0*	(Code)
		I do not know about its effect yet **(certpercw4a)**	*Yes=1,* *No=0*	(Code)
		It will have no effect on women **(certpercw5a)**	*Yes=1,* *No=0*	(Code)
7.5.4	Do you think there are laws that adequately protect the land rights of women? **(llawpw)**		*Yes there are=1* *No there are not=2* *I do not know about this issue=3*	(Code)
7.5.5	Do you think women should have the same rights as men when it comes to making decisions about how land is used? **(lpercdecw)**		*Yes, in all respects =1* *No =0* *Yes, but men should have more say in long-term decisions (i.e. long-term investments such as in trees or soil conservation) = 3* *Yes, but women should have more say in long- term decisions (i.e. long-term investments such as in trees or soil conservation) = 4* *Yes, but men should have more say in short-term decisions (i.e. renting-out/sharecropping-out land) = 5* *Yes, but women should have more say in short- term decisions (i.e. renting-out/sharecropping-out land) = 6* *I choose not to respond = 999*	(Code)

7.5.6	Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? **(llawenf2)**	*Yes there are=1* *No there are not=0 I do not know=888*	(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 (*dichira*) 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 (*dichira*) 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? *Yes=1 No=0* **(irrigation2)**	(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. Investment in Tree and Perennial Crops

Enumerator: These questions ask you about investment made in perennial crops and trees on land owned by your household – this includes all land that you household owns including land that is rented out. It DOES NOT include activities on land that is rented-in.

9.1 Investments in Perennial Crops

Enumerator: these questions refer to the number of perennial tree crops you have planted in the LAST 2 YEARS (i.e. the time period from Yekatit 2010 to Tir 2013 in the Ethiopian Calendar) as well as the total number of surviving plants on that parcel to date (this includes surviving plants from the past two years plus any existing plants which are or are expected to produce).

Parcel	COFFEE		CHAT		ENSET		HOPS (GESHO)		SISAL		BAMBOO	
	Number of planted in the last TWO YEARS (24 MONTHS)	Total number of plants	Number of planted in the last TWO YEARS (24 MONTHS)	Total number of plants	Number of planted in the last TWO YEARS (24 MONTHS)	Total number of plants	Number of planted in the last TWO YEARS (24 MONTHS)	Total number of plants	Number of planted in the last TWO YEARS (24 MONTHS)	Total number of plants	Number of planted in the last TWO YEARS (24 MONTHS)	Total number of plants
	9.01a	**9.01b**	**9.02a**	**9.02b**	**9.03a**	**9.03b**	**9.04a**	**9.04b**	**9.05a**	**9.05b**	**9.06a**	**9.06b**
	ncofflb	**Ncofft**	**nchatlb**	**nchatt**	**nenslc**	**Nenst**	**Nhopslb**	**nhopst**	**Nsislb**	**nsist**	**nbambb**	**Nbambt**
1												
2												
3												
4												
5												

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 2010 to Tir 2013 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) *Skip if (ftrl2rh + ftrl2bh + ftrl2of) = 0*	Where on the parcel were most of these FRUIT trees planted? *Skip if (ftrl2rh + ftrl2bh + ftrl2of) = 0* *2 = In crop lands (agro-forestry)* *3 = Boundaries of crop lands*	
	raised by the household itself	Bought by the household.	Obtained free of charge from others (GOs, NGOs, CBOs).			
	9.2.1a	**9.2.1b**	**9.2.1c**	**9.2.2**	**9.2.3**	**9.2.4**
	ftrl2rh	**ftrl2bh**	**ftrl2of**	**ftrl2sur**	**ftrl2w**	**ftrt**
1						
2						
3						
4						
5						

Parcel	**NON-FRUIT TREES and Naturally Grown INDIGENOUS TREES** 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 *abysinica* (kosso), etc. but not Eucalyptus (bahirzaf). Indigenous trees may grow naturally or be planted by farmers.					
	During the LAST TWO YEARS (24 MONTHS):					What is the TOTAL number of NON-FRUIT trees on this parcel?
	Indicate the NUMBER of seedlings of all types of NON-FRUIT trees planted on each parcel that were:			Number of NON-FRUIT trees surviving (i.e., NINE months plus). *Skip if (nftrl2rh + nftrl2bh + nftrl2of) = 0*	Where on the parcel were most of these NON-FRUIT trees planted? *Skip if (nftrl2rh + nftrl2bh + nftrl2of) = 0* *2 = In crop lands (agro-forestry)* *3 = Boundaries of crop lands* *5 = Others (specify)*	
	raised by the household itself	Bought by the household.	Obtained free of charge from others (GOs, NGOs, CBOs).			
	9.2.5a	**9.2.5b**	**9.2.5c**	**9.2.6**	**9.2.7**	**9.2.8**
	nftrl2rh	**nftrl2bh**	**nftrl2of**	**nftrl2sur**	**nftrl2w**	**nftrt**
1						
2						
3						
4						
5						

9.2. 12.	Has your household received a land certificate? Yes=1; No=2 (Skip to section 10 if answer is No)	(Code)
9.2. 13	Did getting the land certificate lead you to any of this? Plant more perennial trees=a; plant fewer perennial trees= b; plant the same amount of perennial trees=c; did not have any effect on perennial trees= d; I do not plant perennial trees=e **(Ptrees_cert)**	(Code)
9.2. 14	Did getting the land certificate lead you to any of this? Plant more fruit trees=a; plant fewer fruit trees= b; plant the same amount of fruit trees=c; did not have any effect on fruit trees= d; I do not plant fruit trees=e **(Ftrees_cert)**	(Code)
9.2. 15	Did getting the land certificate lead you to any of this? Plant more non-fruit trees=a; plant fewer non-fruit trees= b; plant the same amount of non-fruit trees=c; did not have any effect on non-fruit trees= d; I do not plant non-fruit trees=e **(NFtrees_cert)**	(Code)
9.2. 16	Did getting the land certificate lead you to any of this? Plant more indigenous trees=a; plant fewer indigenous trees= b; plant the same amount of indigenous trees=c; did not have any effect on indigenous trees= d; I do not plant indigenous trees=e **(Itrees_cert)**	

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 2012 to Tir 2013 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 *if '0' skip to* ***(lsnpur)***	Amount of income during the year from the sale of [lsname] *(Birr)*	Number bought during the year *if '0' skip to* ***(lsncons)***	Total amount spent during the year *(Birr)*	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	Horses, donkeys, or mules						
1100	Camels						
1111	Beehives, traditional						
1112	Beehives, modern						

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)

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 *(Birr)*
	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					

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 2012 to Tir 2013 in the Ethiopian Calendar.)

11.1 Cereal production and use

Crop	Cereal Name	Did your household produce, use, or have any [Cereal name]? *Yes=1 No=0 If 'No' skip to next crop*	Amount on hand at the start of Yekatit 2012		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 *(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**	**cropsub**	**cropgq**	**cropgu**	**croprq**	**croppru**	**croppq**	**croppu**	**croppb**
1	Teff															
2	Maize															
3	Wheat															
4	Barley															
5	Sorghum															
6	Millet (Zengada)															
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, cropgu, croppru, croppu)**			
1 = Cm	*6 = Cup*	*10 = Cubic Centimeter*	*21 = Gram*
2 = Meter	*7 = Liter*	*11 = Meter Square*	*22 = Kilogram (kg)*
3 = Number	*8 = Roll*	*12 = Tuba*	*23 = Quintal (=100kg)*
4 = Pair	*9 = Pack*	*13 = Araba*	
5 = Box			

11.2 Pulses production and use

Crop	Crop name	Did you produce OR use (i.e., purchase, receive from others, consume) [crop name]? *Yes=1* *No=0* *If 'No' skip to next crop*	Amount on hand at the start of Yekatit 2012		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 *(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**	**cropsub**	**cropgq**	**cropgu**	**croprq**	**Cropru**	**croppq**	**croppu**	**croppb**
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)															
210	Others (specify)															

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

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

11.3 Oil crop production and use

Crop	Crop name	Did you produce OR use [crop name]? *Yes= 1 No= 0 If 'No' skip to next crop*	Amount on hand at the start of Yekatit 2012		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**	**cropsub**	**cropgq**	**cropgu**	**croprq**	**cropru**	**croppq**	**croppu**	**croppb**
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, 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	
7 = Liter	*21 = Gram*
8 = Roll	*22 = Kilogram (kg)*
9 = Pack	*23 = Quintal (=100kg)*

11.4 Tubers and Roots production and use

Crop	Crop name	Did you produce OR use [crop name]? *Yes=1 No=0 If 'No' skip to next crop*	Amount on hand at the start of Yekatit 2012		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**	**cropsub**	**cropgq**	**cropgu**	**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, 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	
7 = Liter	*21 = Gram*
8 = Roll	*22 = Kilogram (kg)*
9 = Pack	*23 = Quintal (=100kg)*

11.5 Vegetable production and use

Crop	Crop name	Did you produce OR use [crop name]? *Yes=1 No=0 If 'No' skip to next crop*	Amount on hand at the start of Yekatit 2012		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**	**cropsub**	**cropgq**	**cropgu**	**croprq**	**cropru**	**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*
2 = Meter	*Centimeter 11 =*
3 = Number	*Meter Square*
4 = Pair	*12 = Tuba*
5 = Box	*13 = Araba*
6 = Cup	
7 = Liter	*21 = Gram*
8 = Roll	*22 = Kilogram*
9 = Pack	*(kg) 23 = Quintal*
	(=100kg)

11.6 Fruit production and use

Crop	Crop name	Did you produce OR use [crop name]? *Yes=1 No=0 If 'No' skip to next crop*	Amount on hand at the start of Yekatit 2012		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**	**cropsub**	**cropgq**	**cropgu**	**croprq**	**cropru**	**croppq**	**Croppu**	**Croppb**
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, 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	
7 = Liter	*21 = Gram*
8 = Roll	*22 = Kilogram (kg)*
9 = Pack	*23 = Quintal (=100kg)*

11.7 Cash crop production and use

Crop	Crop name	Did you produce OR use [crop name]? *Yes=1 No=0 If 'No' skip to next crop*	Amount on hand at the start of Yekatit 2012		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**	**cropsub**	**cropgq**	**cropgu**	**croprq**	**cropru**	**croppq**	**Croppu**	**croppb**
91	Coffee															
92	Chat/Kat															
93	Pepper															
94	Sugarcane															
95	Cotton															
96	Hopes (Ghesho)															
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	
7 = Liter	*21 = Gram*
8 = Roll	*22 = Kilogram (kg)*
9 = Pack	*23 = Quintal (=100kg)*

12. Farm Inputs

Enumerator: I'm going to ask you some questions about the inputs you applied in THE LAST crop year (from Yekatit 2012 to Tir 2013) 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

	Crop 1											
	Is this parcel fully rented out to others; Yes=1 No=0 skip to next parcel	Crop (see codes)	Quantity produced of crop (in kg)	Did you sow/plant IMPROVEDseeds / 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	
Owned Parcel					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	*Combine 1 and 2 = 5*
Own oxen = 2	*Combine 1 and 4 = 6*
Rented/shared oxen = 3	*Combine 3, and 4 = 7*
Rented tractor = 4	*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? *See codes*	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)**

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

12.2 Crop 2

	Crop 2										
Owned Parcel	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	*Combine 1 and 2 = 5*
Own oxen = 2	*Combine 1 and 4 = 6*
Rented/shared oxen = 3	*Combine 3, and 4 = 7*
Rented tractor = 4	*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) Cash and in kind	What is the SOURCE of credit taken? *See codes*	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)**	
Government=1	*Saving and Credit Association=5*
NGOs=2	*Agricultural input supplier or dealer= 6*
Private money lenders=3	*Others (specify)=97*
Relatives/friends=4	

12.3 Crop 3

	Crop 3											
Owned Parcel	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_crc	**picropkg_crc**	**impseed_crc**	**cfertq_crc**	**cfertu_crc**	**ofertq_crc**	**ofertu_crc**	**pchemq_crc**	**pchemu_crc**	**lchemq_crc**	**lchemu_crc**
1											
2											
3											
4											
5											
	12.3.1r	**12.3.2r**	**12.3.3r**	**12.3.4ar**	**12.3.4br**	**12.3.5ar**	**12.3.6br**	**12.3.7ar**	**12.3.7br**	**12.3.8ar**	**12.3.8br**
Rented-IN Parcel	**picropid_ri_cr3**	**picropkg_ri_cr3**	**impseed_ri_cr3**	**cfertq_ri_ cr3**	**cfertu_ri_cr3**	**ofertq_ri_cr3**	**ofertu_ri_cr3**	**pchemq_ri_cr3**	**pchemu_ri_cr3**	**lchemq_ri_cr3**	**lchemu_ri_cr3**
101											
102											
103											

12.3 Crop 3 (continued)

	Crop 3			
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? *See codes*	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_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 22 = Kilogram (kg)*
3 = Number	*9 = Pack*	*23 = Quintal (=100kg)*
4 = Pair	*10 = Cubic Centimeter 11 = Meter Square*	
5 = Box		
6 = Cup		

Crop codes			
CEREALS	***PULSES***	***TUBERS AND ROOTS***	***FRUITS***
1= Teff	*21=Bean (Baqela)*	*41=Enset (Kocho)*	*71=Banana*
2=Maize	*22=Lentils (Mesir)*	*42=Potato*	*72=Orange*
3=Wheat	*23=Chick Pea (Shimbra) 24=Field Pea (Ater)*	*43=Sweet Potato (Sekuar)*	*73=Lemon*
4=Barley	*25= Cow Pea (Akuri Ater) 26=Haricot Beans (Boloke)*	*44=Yam*	*74=Papaya*
5=Sorghum	*27=Vetch (Guaya)*	*45=Godere*	*75=Mango 76= Apple*
6=Millet	*28=Adenguare*	*410=Other (specify)*	*77=Avocado 78= Guava*
7=Oats	*29=Fenugreek (Abish)*		*79=Gishta*
8=Dagussa	*120= Other (specify)*		*170=Others (specify)*
9=Rice			
10=Sinar/Gerima 110=Other (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 (Ghesho)* *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					
3021	Others, (specify)					

Unit codes **(prodpu, prodru)**	
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)*

13.07	What is the approximate MONTHLY household expenditure on food purchases (includes processed foods) in Birr? **(foodexp)**	(Numeric)
13.08	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)
13.09	What is the total amount in BIRR of household expenditure for regular festivals/holidays, and traditional/cultural events during the past YEAR? **(holidayexp2)**	(Numeric)

13.10	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 2012 to Tir 2013, in Birr? (econinca)	

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.

14.00	Does the house have electricity? **(elec2)**	*Yes=1*	*No=0*	(Code)
14.01	Iron-Roofed House **(ironroof2)**	*Yes=1*	*No=0*	(Code)
14.02	Television Set **(tv2)**	*Yes=1*	*No=0*	(Code)
14.03	Mobile Phone **(mobile2)**	*Yes=1*	*No=0*	(Code)
14.04	Tape Recorder **(taperec2)**	*Yes=1*	*No=0*	(Code)
14.05	Radio Receiver **(radio2)**	*Yes=1*	*No=0*	(Code)
14.06	Set of Sofa **(sofa2)**	*Yes=1*	*No=0*	(Code)
14.07	Spring/Sponge-mattresses bed **(mattress2)**	*Yes=1*	*No=0*	(Code)
14.08	Metal/Plastic Water Barrel **(barrel2)**	*Yes=1*	*No=0*	(Code)
14.09	Horse/donkey cart **(cart2)**	*Yes=1*	*No=0*	(Code)
14.10	Bicycle **(bicycle2)**	*Yes=1*	*No=0*	(Code)
14.11	Motor Bicycle **(motorbike2)**	*Yes=1*	*No=0*	(Code)
14.12	Steel plow**(plow2)**	*Yes=1*	*No=0*	(Code)
14.13	Tractor **(tractor2)**	*Yes=1*	*No=0*	(Code)
14.14	Water pump (hand/ motorized) **(pump2)**	*Yes=1*	*No=0*	(Code)
14.15	Modern Beehives **(beehive2)**	*Yes=1*	*No=0*	(Code)
14.16	Jewellery (Silver, Gold, etc) **(jewelty2)**	*Yes=1*	*No=0*	(Code)
14.17	Kiosk **(kiosk2)**	*Yes=1*	*No=0*	(Code)
14.18	A house in town **(townhouse2)**	*Yes=1*	*No=0*	(Code)
14.19	Improved dairy cows **(improv_cow2)**	*Yes=1*	*No=0*	(Code)

14. 20	Fattening enterprise **(fat_entrprz2)**	*Yes=1*	*No=0*	(Code)
14. 21	Modern milk churning equipment **(milkchurn2)**	*Yes=1*	*No=0*	(Code)
14. 22	Non-mobile phone **(nmphone2)**	*Yes=1*	*No=0*	(Code)
14. 23	Computer **(compu2)**	*Yes=1*	*No=0*	(Code)
14. 24	Refrigerator **(refrig2)**	*Yes=1*	*No=0*	(Code)
14. 25	Table **(table2)**	*Yes=1*	*No=0*	(Code)
14. 26	Chair **(chair2)**	*Yes=1*	*No=0*	(Code)
14. 27	Bed with a cotton, sponge, or spring mattress **(bedmatt2)**	*Yes=1*	*No=0*	(Code)
14. 28	Electric mitad **(elecmitad2)**	*Yes=1*	*No=0*	(Code)
14. 29	Kerosene or pressure lamp **(kplamp2)**	*Yes=1*	*No=0*	(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 2010 to Tir 2013 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)**	*Yes=1* *No=0* *if 'No' skip to (temp_leave)*	(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. *Reason for leaving codes:* *Schooling=1* *Looking for job=2* *To assist relatives= 3* *Sick/for medication=4* *Marriage =5* *Divorce = 6* *Shortage of land = 7* *Others(specify)=97*		
		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)**	*Yes=1 No=0* *if 'No' skip to 15.08*	(Code)

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 2010 to Tir 2013 in the Ethiopian Calendar)

Name of household member	15.05 Has this member of your family left home TEMPORARILY in search of work during the LAST 2 YEARS (24 MONTHS)? *Yes=1 No=0* *if 'No' skip to Next member*	How many days, has (have) this member of your family has been away from home? *(Enter the number of days for each of the last 2 years.)*		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*		What is the total annual income earned (in Birr or Birr equivalent in kind) *(Birr)* If Not sure, enter -888	
		Most recent Yekatit 2012 to Tir 2013	*Previous to last Yekatit 2010 to Tir 2012*	*Most recent Yekatit 2012 to Tir 2013*	*Previous to last Yekatit 2010 to Tir 2012*	*Most recent Yekatit 2012 to Tir 2013*	*Previous to last Yekatit 2010 to Tir 2012*
	15.05	**15.05a**	**15.05b**	**15.06a**	**15.06b**	**15.07a**	**15.07b**
(PII)	**has_left**	**nwaway1**	**nwaway2**	**faway1**	**faway2**	**incaway1**	**Incaway2**

16. Decision Making

Enumerator: Please ensure that respondents know that nobody will judge his/her answers to the following questions.

Who usually decides how the money you earn will be used: you, your (spouse/partner), or you and your (spouse/partner) jointly?	Would you say that the money that you earn is more than what your (spouse/partner) earns, less than what he earns, or about the same?	Who usually decides how your (husband's/partner's) earnings will be used: you, your (spouse/partner), or you and your (spouse/partner) jointly?	Who usually makes decisions about health care for yourself: you, your (spouse/partner), you and your (spouse/partner) jointly, or someone else?	Who usually makes decisions about making major household purchases?	Who usually makes decisions about visits to your family or relatives?	Do you own this or any other house either alone or jointly with someone else?	Do you have a title deed or other government recognized document for any house you own?	Is your name on this document?
16.01	**16.02**	**16.03**	**16.04**	**16.05**	**16.06**	**16.07**	**16.08**	**16.09**
1=Respondent alone *2= Spouse alone* *3=Respondent and spouse jointly* *4=Other household member* *5=Other (specify)*	*1=More than him/her* *2=Less than him/her* *3=About the same* *4=Spouse has no earning* *5=Do not know*	*1=Respondent* *2= Spouse* *3=Respondent and spouse jointly* *4=Other household member* *5=Other (specify)*	*1=Respondent* *2= Spouse* *3=Respondent and spouse jointly* *4=Other household member* *5=Other (specify)*	*1=Respondent* *2= Spouse* *3=Respondent and spouse jointly* *4=Other household member* *5=Other (specify)*	*1=Respondent* *2= Spouse* *3=Respondent and spouse jointly* *4=Other household member* *5=Other (specify)*	*1=Alone only* *2=Spouse alone* *3=Respondent and spouse jointly* *4= Other household member* *5=Does not own*	*1=Yes* *2=No* *3= Do not know*	*1=Yes* *2=No* *3=Do not know*
(code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)

17. Participation in the previous surveys

17	Did you or someone in your household participate in:		(Code)
17.01	The survey in 2000 of Ethiopian calendar (December 2007 Western calendar)?	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)
17.02	The survey in 2004 of the Ethiopian Calendar (May 2012 Western calendar)?	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)
17.03	The survey in 2008 of the Ethiopian Calendar (May 2015 Western calendar)	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)

18. Follow-up contact information

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

18.01	Would you mind being contacted for any follow-up questions? **(followup)**	*Yes=1*	*No=0*	(Code)
18.02	Do you have a mobile phone number? **(mob_own1)**	*Yes=1*	*No=0 if 'No' skip to **(mob_cont2)***	(Code)
18.03	If yes, is it ok if we contact you via this number? **(mob_cont1)**	*Yes=1*	*No=0 if 'No' ->END*	(Co)
18.04	If yes, what is the number? **(PII)**			(Integer)
18.05	Is there a second number from someone from the HH that we could use to contact you? **(mob_cont2)**	*Yes=1 if 'No' ->END*	*No=0*	(Code)
18.06	If yes, what is the number? **(PII)**			(Integer)

Codes

Livestock codes **(lsid)**	Animal products and other food and non-food consumption items **(prodid)**	
1001 = Oxen *1002 = Cows* *1003 = Heifers* *1004 = Bulls* *1005 = Calves* *1006 = Sheep* *1007 = Goats* *1008 = Chicken* *1009 = Equines* *1100 = Beehives, traditional 1111 = Beehives, modern*	***ANIMAL PRODUCTS*** *2001 = Milk* *2002 = Butter* *2003 = Cheese* *2004 = Egg* *2005 = Meat* *2006 = Honey* *2007 = Hides and skin* *2008 = Wool* *20010 = Other (specify)*	***PURCHASED FOOD AND NON-FOOD CONSUMPTION ITEMS*** *3001 = Bread* *3002 = Pasta (spaghetti)* *3003 = Can of Coke (regular) 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)*

IRB # 20-0002

Appendix 10. Survey for Wives (monogamous households)

EconInsights and Landesa

Impact Evaluation of Land Certification in Four Regions in Ethiopia Endline WIVE(S) Survey (Long Version)

S2-1	Questionnaire ID Number (HH ID) **(hh_id)**	(Integer)	
S2-2	Enumerator ID **(enumerator_ID)**		(Numeric)
S2-3	Region **(killil)**	*Tigray =1 Amhara =2 Oromia = 3 SNNP = 4*	(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)

Roster wives' respondents

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

Resp. ID	Name *Make a complete list of all the wives taking part in the wives questionnaire.*	How old are you? *Number of years*	For how many years have you been married? *Number of years*	What is the highest level of education you have received? *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*
wifeid	**PII**	**A.2**	**A.3**	**A.4**
1	**(w1_wifenm)**	**(w1_wifeage)**	**(w1_wifenyrmar)**	**(w1_wifeedu)**
2	**(w2_wifenm)**	**(w2_wifeage)**	**(w2_wifenyrmar)**	**(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). Regardless of their self-identification, if there is more than one wife, you will have to randomly assign a longer or shorter version of the wives' questionnaire to them.

If there is more than 1 wife, you will have to tell the wives that there is a short and a long version of the questionnaire, roll 'a dice and the wife will the smallest number will answer the shorter questionnaire. Tell them you can't share the content of the questions and they should not do that either.

Enumerator Note: in this questionnaire ''during the last 24 months'' refers to the time period from Yekatit 2010 to Tir 2012 in the Ethiopian Calendar and 'during last year' refers to the period from Yekatit 2011 to Tir 2012 in the Ethiopian Calendar.

Wife Questionnaire – Long Version (60 questions) – Fill in WIFE ID =

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 p**os**sess 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**	**parcw1lsit**	**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.

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

1.8	1.9	1.10	1.11	1.12	1.13a	1.13b
Who decides on what crops to grow on **[parcelid]**? *husband = 1* *Wife = 2* *Husband & wife = 3* *Children = 4* *Whole family = 5* *Other = 97*	Do you yourself make decisions regarding the use of the produce from **[parcelid]**? *No = 0* *Yes =1* *If 'yes' skip to parcw1rent*	Do you want to be allowed to make a decision regarding the use of the produce from **[parcelid]**? *No = 0* *Yes =1* *Prefer not to respond = 999*	Can you rent-out/sharecrop-out **[parcelid]**when you want? *No = 0* *Yes =1*	Do you make this decision to rent-out/sharecrop-out **[parcelid]**by yourself? *No = 0* *Yes =1*	Would you be willing to rent out **[parcelid]**to:	
					Close friends and family? *No = 0* *Yes =1*	A person outside of your close friends and family? *No = 0* *Yes =1*
parcw1dcrop	**parcw1duse**	**parcw1wduse**	**parcw1drent**	**parcw1wdrent**	**parcw1routf**	**parcw1routo**

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_lddiv2)** *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 certification take place in your kebele? **(w1_wiklcertyr)**	*year in EC*	(Numeric)
2.8	Did you participate in the kebele meetings that discussed the process of land certification in your kebele? **(w1lcertm2)**	*Yes=1 No= 0* *I have no idea about this = 3*	(Code)
2.9	If yes, when did you participate in the kebele meetings that discussed the process of land certification in your kebele? **(w1lcertmyr)**	*year in EC*	(Numeric)
2.10	Have you ever been elected and served in the kebele land administration committee? **(w1elect2)**	*Yes = 1 No= 0* *I have no idea about this = 3* *if '2' or '3' skip to* ***w1survpres***	(Code)
2.11	If yes, when were you elected to serve on the kebele land administration committee? **(w1electyr)**	*year in EC*	(Numeric
2.12	Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? **(w1survpres2)**	*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*	(Code)
2.13	When did the surveyors come to measure your (also household's) land? **(w1survpresyr)**	*year in EC*	(Numeric

SECTION 3: Land-related disagreements

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

Type ID	Type of disagreement	3.0. 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?		
	Enumerator: Probe and code, select all that apply.	*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_disphelpe2***)* 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)

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 – From Yekatit 2010 to Tir 2012).

3.9	3.10	3.11	3.12	3.13	3.14	3.15	3.16
During the last two years (24 MONTHS), were you involved in any land related disagreements on {parcel ID}? *Yes =1* *No = 2* *If No, Skip to next parcel*	What type of land related disagreement ? *(probe and code, see codes)*	How serious was the disagree ment? *(code)*	Was it resolved? *Yes =1* *No = 2* *If No, skip to w1dispref*	How was this dispute finally resolved? *Ask if w1dispres=1* *(code)*	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* *(code)*	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: 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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes, it will improve my negotiation power=1* *No impact at all=2* *I do not know about it wait and see=3*	(Code)
4.5	How do you perceive/see the effect of land certification on women? **(w1_certperc)** *Enumerator: Read responses, probe and code selecting all that apply.*		

It will enhance women's bargaining power within the household **(w1_certperca2)** *Yes=1, No=0*	(Code)
It could bring economic independence to women **(w1_certpercc2)** *Yes=1, No=0*	(Code)
Other perceived effects? **(w1_certperce2)** *Yes=1, No=0*	(Code)
If Yes, specify	(Text)
I do not know about its effect yet **(w1_certpercd2)**	(Code)
Yes=1, No=0	
It will have no effect on women **(w1_certpercb2)** *Yes=1, No=0*	(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)**	*Very confident-1* *Confident=2 Somewhat confident=3 Not at all confident=4*	
4.7	Do you think there are laws that adequately protect the land rights of women? **(w1_llawpw2)**	*Yes there are=1 No there are not=2* *I do not know about this issue=3*	(Code)
4.8	Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? **(w1_llawenf2)**	*Yes there are=1 No there are not=2 I do not know=3*	(Code)

SECTION 5. Decision Making

Enumerator: Please ensure that respondents know that nobody will judge his/her answers to the following questions.

Who usually decides how the money you earn will be used?	Would you say that the money that you earn is more than what your (spouse/partner) earns, less than what he earns, or about the same?	Who usually decides how your husband's earnings will be used?	Who usually makes decisions about health care for yourself?	Who usually makes decisions about making major household purchases?	Who usually makes decisions about visits to your family or relatives?	Do you own this or any other house either alone or jointly with someone else?	Do you have a title deed or other government recognized document for any house you own?	Is your name on this document?
5.1	**5.2**	**5.3**	**5.4**	**5.5**	**5.6**	**5.7**	**5.8**	**5.9**
1=Respondent alone 2= Spouse alone 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)	*1=More than him/her 2=Less than him/her 3=About the same 4=Spouse has no earning 5=Do not know*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Alone only 2=Spouse alone 3=Respondent and spouse jointly 4= Other household member 5=Does not own*	*1=Yes 2=No 3= Do not know*	*1=Yes, respondent alone 2=Yes, respondent and spouse's name 3=No, only spouse's name. 4= None 5=Don't know*
(code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)

5.10	In your opinion, is a husband justified in hitting or beating his wife in the following situations:		(Code)
5. 10.1	If she goes out without telling him?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
5.10.2	If she neglects the children?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
5.10.3	If she argues with him?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
5.10.4	If she refuses to have sex with him?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
5.10.5	If she burns the food?	*1=Yes; 2=No; 3= Doesn't know*	(Code)

6. Experience of Violence

6.1	First, I am going to ask you about some situations which happen to some women. Please tell me if these apply to your relationship with your husband/partner?		
A	He is jealous or angry if you (talk/talked) to other men?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
B	He frequently accuses you of being unfaithful?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
C	He does not permit you to meet your female friends?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
D	He tries to limit your contact with your family?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
E	He insists on knowing where you (are/were) at all times?	*1=Yes; 2=No; 3= Doesn't know*	(Code)

6.2	Has your husband/spouse ever?	Ever?		How often did this happen during the last 12 months?	
A	Say or do something to humiliate you in front of others?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
B	Threaten to hurt or harm you or someone you care about?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
C	Insult you or make you feel bad about yourself?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
D	Push you, shake you, or throw something at you?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
E	Slap you?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
F	Twist your arm of pull your hair	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
G	Punch you with his fist or with something that could hurt you?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
H	Kick you, drag you, or beat you up?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
I	Try to choke you or burn you on purpose?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
J	Threaten or attack you with a knife, gun, or	*1=Yes; 2=No; 3=*	(Code)	Often=1;	(Code)

	other weapon?	*Doesn't know*		Sometimes=2; not in the last 12 months=3	
K	Physically force you to have sexual intercourse with him when you did not want to?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
L	Physically forced you to perform other sexual acts you did not want to?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
M	Force you with threats or in another way to perform sexual acts that you did not want to?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)

Enumerator: If at least 1 yes, then follow with 6.3; Not a single yes, go to question 6.5

6.3	How long after you first got married, did this (any of the things she marked as yes) first happen?	*(In Number of years)*	(Number)
6.4	Did any of this happen before or after you/your household receive the land certificate?	*1= before the land certificate; 2=after the land certificate; 3= before and after the land certificate; 4= I can't remember; 5= I/my household doesn't have a land certificate*	(Code)

6.5	Did any of the following happen to you as a result of what your husband did to you?		
A	You had cuts, bruises, or aches?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
B	You had eye injuries, sprains, dislocations, or burns?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
C	You had deep wounds, broken bones, broken teeth, or any other serious injury?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
D	You missed going to work, working in your home or doing any of your daily activities?	*1=Yes; 2=No; 3= Doesn't know*	(Code)

6.6	Have you ever hit, slapped, kicked, or done anything else to physically hurt your husband at times when he was not already beating or physically hurting you?	*1=Yes; If yes, continue with the next question* *2=No; If no, move to question 6.7*	(Code)
6.7	In the last 12 months, how often have you done that your husband?	*1= Often; 2=sometimes; 3=not at all*	(Code)
6.8	Does your husband drink alcohol?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
6.9	Are you afraid of your husband: most of the time, sometimes or never?	*1=Most of the time; 2= Sometimes; 3= Never*	(Code)

6.10	From the time you were 15 years old has anyone other than your husband hit you, slapped you, kicked you, or done anything else to physically hurt you?	*1=Yes (if yes, continue to the next question) ; 2=No; 3= Refuse to answer; if no or refuse to answer, then go to question 6.14*	(Code)

6.11	Who hurt you in this way? anyone else? Record all mentioned		
A	Mother/step-mother	*1=Yes; 2=No;*	(Code)
B	Father/step-father	*1=Yes; 2=No;*	(Code)
C	Sister/brother	*1=Yes; 2=No;*	(Code)

D	Daughter/son	*1=Yes; 2=No;*	(Code)
E	Other relative	*1=Yes; 2=No;*	(Code)
F	Current boyfriend	*1=Yes; 2=No;*	(Code)
G	Former boyfriend	*1=Yes; 2=No;*	(Code)
H	Mother-in-law	*1=Yes; 2=No;*	(Code)
I	Father-in-law	*1=Yes; 2=No;*	(Code)
J	Other in-law	*1=Yes; 2=No;*	(Code)
K	Teacher	*1=Yes; 2=No;*	(Code)
L	Employer/someone at work	*1=Yes; 2=No;*	(Code)
M	Police/soldier	*1=Yes; 2=No;*	(Code)
N	Other	*Who?*	

If at least one yes, then continue to question 6.12. Otherwise thank and move to question 6.16.

6.12	Over the last 12 months, how often did this happen?	*1= Often; 2=sometimes; 3=not at all*	(Code)

6.13	Thinking about what you yourself have experienced among the different things we have been talking about, have you ever tried to seek help?	*1=Yes (if yes, continue to the next question) ; 2=No; 3= Refuse to answer; if no or refuse to answer, then thank and go to section 17*	(Code)

6.14	From whom you sought help? Anything else? Record all mentioned		
A	Own family	*1=Yes; 2=No;*	(Code)
B	Husband's/partner's family	*1=Yes; 2=No;*	(Code)
C	Current/former husband	*1=Yes; 2=No;*	(Code)
D	Current/former boyfriend	*1=Yes; 2=No;*	(Code)
E	Friend	*1=Yes; 2=No;*	(Code)
F	Neighbor	*1=Yes; 2=No;*	(Code)
G	Religious leader	*1=Yes; 2=No;*	(Code)
H	Doctor/medical personnel	*1=Yes; 2=No;*	(Code)
I	Police	*1=Yes; 2=No;*	(Code)
J	Lawyer	*1=Yes; 2=No;*	(Code)
K	Social service organization	*1=Yes; 2=No;*	(Code)
L	Other	*Specify*	(Code)

6.15	Have you ever told anyone about this?	*1=Yes; 2=No;*	(Code)
6.16	As far as you know, did your father ever beat your mother	*1=Yes; 2=No;*	(Code)
6.17	Did you have to interrupt the interview because some adult was trying to listen or	*1=Yes; 2=No;*	(Code)

	came into the room, or interfered in any other way		

Thank the respondent for her cooperation and reassure her about the confidentiality of her answers.

17. Participation in the previous surveys

17	Did you or someone in your household participate in:		(Code)
17.01	The survey in 2000 of Ethiopian calendar (December 2007 Western calendar)?	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)
17.02	The survey in 2004 of the Ethiopian Calendar (May 2012 Western calendar)?	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)
17.03	The survey in 2008 of the Ethiopian Calendar (May 2015 Western calendar)	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)

18. Follow-up contact information

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

18.01	Would you mind being contacted for any follow-up questions? **(followup)**	*Yes=1 No=0*	(Code)
18.02	Do you have a mobile phone number? **(mob_own1)**	*Yes=1 No=0 if 'No' skip to* ***(mob_cont2)***	(Code)
18.03	If yes, is it ok if we contact you via this number? **(mob_cont1)**	*Yes=1 No=0 if 'No' ->END*	(Co)
18.04	If yes, what is the number? **(PII)**		(Integer)
18.05	Is there a second number from someone from the HH that we could use to contact you? **(mob_cont2)**	*Yes=1 No=0 if 'No' ->END*	(Code)
18.06	If yes, what is the number? **(PII)**		(Integer)

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Appendix 11. Survey for Wives in Polygamous households – Long Questionnaire

EconInsights and Landesa

Impact Evaluation of Land Certification in Four Regions in Ethiopia Endline WIVE(S) Survey (Long Version)

Prior to starting the wives survey please collect the following information from the male enumerator counter

1. **Confirm the husband consent to interview his wives**
2. **Get the list of the wives and their address**
3. **Precisely copy the household Id (and the name of the head) and all the parcel id and parcel names currently owned by the household**

S2-1	Questionnaire ID Number (HH ID) **(hh_id)**	(Integer)	
S2-2	Enumerator ID **(enumerator_ID)**		(Numeric)
S2-3	Region **(killil)**	*Tigray =1 Amhara =2 Oromia = 3 SNNP = 4 5= Sidama*	(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)

Roster wives' respondents

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

Resp. ID	Name *Make a complete list of all the wives taking part in the wives questionnaire.*	How old are you? *Number of years*	For how many years have you been married? *Number of years*	What is the highest level of education you have received? *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*
wifeid	**PII**	**A.2**	**A.3**	**A.4**
1	**(w1_wifenm)**	**(w1_wifeage)**	**(w1_wifenyrmar)**	**(w1_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). Regardless of their self-identification, if there is more than one wife, you will have to randomly assign a longer or shorter version of the wives' questionnaire to them.

If there is more than 1 wife, you will have to tell the wives that there is a short and a long version of the questionnaire, flip a coin in the absence of the wives and the wife with lion heads up will answer the longer version of the questionnaire . Tell them you can't share the content of the questions and they should not do that either.

Enumerator Note: in this questionnaire ''during the last 24 months'' refers to the time period from Yekatit 2011 to Tir 2013 in the Ethiopian Calendar and 'during last year'=last 12 months refers to the period from Yekatit 2012 to Tir 2013 in the Ethiopian Calendar.

Wife Questionnaire – Long Version (60 questions) – Fill in WIFE ID =

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]**? *1 = Husband and wife (both spouses)* *2 = Only may name* *3= Husband only* *5 = whole family(household)* *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* *Husband photo on 2nd level, no photo on first =7* *Husband photo on 2nd level, no photo on first =8* *Other family member = 9* I do not know = 888 Not applicable = -997
parcw1own	**parcw1cer**	**parcw1t**	**parcw1lsit**	**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.

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

1.8	1.9	1.10	1.11	1.12	1.13a	1.13b
Who decides on what crops to grow on **[parcelid]**? *husband = 1* *Wife = 2* *Husband & wife = 3* *Children = 4* *Whole family = 5* *Other = 97*	Do you yourself make decisions regarding the use of the produce from **[parcelid]**? *No = 0* *Yes =1* *If 'yes' skip to parcw1rent*	Do you want to be allowed to make a decision regarding the use of the produce from **[parcelid]**? *No = 0* *Yes =1* *Prefer not to respond = 999*	Can you rent-out/sharecrop-out **[parcelid]**when you want? *No = 0* *Yes =1* *If 'Yes' skip to* **parcw1routf** **[]**	Do you make this decision to rent-out/sharecrop-out **[parcelid]**by yourself? *No = 0* *Yes =1*	Would you be willing to rent out **[parcelid]**to:	
					Close friends and family? *No = 0* *Yes =1*	A person outside of your close friends and family? *No = 0* *Yes =1*
parcw1dcrop	**parcw1duse**	**parcw1wduse**	**parcw1drent**	**parcw1wdrent**	**parcw1routf**	**parcw1routo**

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_lddiv2)** *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	If yes, 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 certification take place in your kebele? **(w1_wiklcertyr)**	*year in EC*	(Numeric)
2.8	Did you participate in the kebele meetings that discussed the process of land certification in your kebele? **(w1lcertm2)**	*Yes=1 No= 0* *I have no idea about this = 3*	(Code)
2.9	If yes, when did you participate in the kebele meetings that discussed the process of land certification in your kebele(for the last time)? **(w1lcertmyr)**	*year in EC*	(Numeric)
2.10	Have you ever been elected and served in the kebele land administration committee? **(w1elect2)**	*Yes = 1 No= 0* *I have no idea about this = 3* *if '2' or '3' skip to* ***w1survpres***	(Code)
2.11	If yes, when were you elected to serve on the kebele land administration committee? **(w1electyr)**	*year in EC*	(Numeric
2.12	Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? **(w1survpres2)**	*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*	(Code)
2.13	When did the surveyors come to measure your (also household's) land? **(w1survpresyr)**	*year in EC*	(Numeric

SECTION 3: Land-related disagreements

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

Type ID	Type of disagreement	3.0. 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?		
	Enumerator: Probe and code, select all that apply.	*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_disphelpe2***)* 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)

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 – From Yekatit 2011 to Tir 2013).

3.9	3.10	3.11	3.12	3.13	3.14	3.15	3.16
During the last two years (24 MONTHS), were you involved in any land related disagreements on {parcel ID}? *Yes =1* *No = 2* *If No, Skip to next parcel*	What type of land related disagreement ? *(probe and code, see codes)*	How serious was the disagree ment? *(code)*	Was it resolved? *Yes =1* *No = 2* *If No, skip to w1dispref*	How was this dispute finally resolved? *Ask if w1dispres=1* *(code)*	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* *(code)*	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: 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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes, it will improve my negotiation power=1* *No impact at all=2* *I do not know about it wait and see=3*	(Code)
4.5	How do you perceive/see the effect of land certification on women? **(w1_certperc)** *Enumerator: Read responses, probe and code selecting all that apply.*		

It will enhance women's bargaining power within the household **(w1_certperca2)** *Yes=1, No=0*	(Code)
It could bring economic independence to women **(w1_certpercc2)** *Yes=1, No=0*	(Code)
Other perceived effects? **(w1_certperce2)** *Yes=1, No=0*	(Code)
If Yes, specify	(Text)
I do not know about its effect yet **(w1_certpercd2)**	(Code)
Yes=1, No=0	
It will have no effect on women **(w1_certpercb2)** *Yes=1, No=0*	(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)**	*Very confident-1* *Confident=2 Somewhat confident=3 Not at all confident=4*	
4.7	Do you think there are laws that adequately protect the land rights of women? **(w1_llawpw2)**	*Yes there are=1 No there are not=2* *I do not know about this issue=3*	(Code)
4.8	Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? **(w1_llawenf2)**	*Yes there are=1 No there are not=2 I do not know=3*	(Code)

SECTION 5. Decision Making

Section 5.1 has questions about you and about your husband

Enumerator: Please ensure that respondents know that nobody will judge his/her answers to the following questions.

As you know, some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. In the last seven days, have you done any of these things or any other work?"	Respondent has a job, but currently absent : "Although you did not work in the last seven days, do you have any job or business from which you were absent for leave, COVID, illness other than COVID, vacation, maternity leave, or any other such reason?"	Do you usually work throughout the year, or do you work seasonally, or only once in a while?	Has your husband worked in the last seven days?	If the answer to (5.1.4 is no, ask this) Although your husband did not work in the last seven days, does he have any job or business from which he was absent for leave, illness, vacation, or any other such reason??	Does he usually work throughout the year, or does he work seasonally, or only once in a while?	Does your husband help you with household chores like looking after children, cooking, cleaning the house and doing other work around the house?
5.1.1	**5.1.2**	**5.1.3**	**5.1.4**	**5.1.5**	**5.1.6**	**5.1.7**
1= Yes *2= No* *if yes, skip to 5.1.3* (code)	*1=COVID* *2= illness other than COVID* *3=vacation* *4= maternity leave* *5=other (specify)* (Code)	*1=Throughout the year* *2= I only work seasonally* *3=I only work once in a while* *4=Other (specify)* (Code)	*1=Yes* *2= No* (Code)	*1=COVID* *2= illness other than COVID* *3=vacation* *4= maternity leave* *5=other (specify)* (Code)	*1=Throughout the year* *2= He only works seasonally* *3=He only works once in a while* *4=Other (specify)* (Code)	*1=Yes, always* *2=Yes, often* *3= Yes, sometimes* *4= No, never* *5=Does not know* (Code)

These questions are asking your opinions about you make decisions in your family. No one will judge your answers.

Enumerator: Please ensure that respondents know that nobody will judge his/her answers to the following questions.

Who usually decides how the money you earn will be used?	Would you say that the money that you earn is more than what your (spouse/partner) earns, less than what he earns, or about the same?	Who usually decides how your husband's earnings will be used?	Who usually makes decisions about health care for yourself?	Who usually makes decisions about making major household purchases?	Who usually makes decisions about visits to your family or relatives?	Do you own this or any other house either alone or jointly with someone else?	Do you have a title deed or other government recognized document for any house you own?	Is your name on this document?
5.1	**5.2**	**5.3**	**5.4**	**5.5**	**5.6**	**5.7**	**5.8**	**5.9**
1=Respondent alone 2= Spouse alone 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)	*1=More than him/her 2=Less than him/her 3=About the same 4=Spouse has no earning 5=Do not know*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Alone only 2=Spouse alone 3=Respondent and spouse jointly 4= Other household member 5=Does not own*	*1=Yes 2=No 3= Do not know*	*1=Yes, respondent alone 2=Yes, respondent and spouse's name 3=No, only spouse's name. 4= None 5=Don't know*
(code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)

Enumerator: are you interviewing the second wife in the polygamous household using the shorter version of the questionnaire ?

1= Yes **(if yes skip to section 17)** 2= No

5.10	In your opinion, is a husband justified in hitting or beating his wife in the following situations:		(Code)
5. 10.1	If she goes out without telling him?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
5.10.2	If she neglects the children?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
5.10.3	If she argues with him?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
5.10.4	If she refuses to have sex with him?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
5.10.5	If she burns the food?	*1=Yes; 2=No; 3= Doesn't know*	(Code)

6. Experience of Violence

6.1	First, I am going to ask you about some situations which happen to some women. Please tell me if these apply to your relationship with your husband/partner?		
A	He is jealous or angry if you (talk/talked) to other men?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
B	He frequently accuses you of being unfaithful?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
C	He does not permit you to meet your female friends?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
D	He tries to limit your contact with your family?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
E	He insists on knowing where you (are/were) at all times?	*1=Yes; 2=No; 3= Doesn't know*	(Code)

6.2	Has your husband/spouse ever?	Ever?		How often did this happen during the last 12 months?	
A	Say or do something to humiliate you in front of others?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
B	Threaten to hurt or harm you or someone you care about?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
C	Insult you or make you feel bad about yourself?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
D	Push you, shake you, or throw something at you?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
E	Slap you?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)

F	Twist your arm of pull your hair	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
G	Punch you with his fist or with something that could hurt you?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
H	Kick you, drag you, or beat you up?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
I	Try to choke you or burn you on purpose?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
J	Threaten or attack you with a knife, gun, or other weapon?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
K	Physically force you to have sexual intercourse with him when you did not want to?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
L	Physically forced you to perform other sexual acts you did not want to?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)
M	Force you with threats or in another way to perform sexual acts that you did not want to?	*1=Yes; 2=No; 3= Doesn't know*	(Code)	Often=1; Sometimes=2; not in the last 12 months=3	(Code)

Enumerator: If at least 1 yes, then follow with 6.3; Not a single yes, go to question 6.5

6.3	How long after you first got married, did this (any of the things she marked as yes) first happen?	*(In Number of years)*	(Number)
6.4	Did any of this happen before or after you/your household receive the land certificate?	*1= before the land certificate; 2=after the land certificate; 3= before and after the land certificate; 4= I can't remember; 5= I/my household doesn't have a land certificate*	(Code)

6.5	Did any of the following happen to you as a result of what your husband did to you?		
A	You had cuts, bruises, or aches?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
B	You had eye injuries, sprains, dislocations, or burns?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
C	You had deep wounds, broken bones, broken teeth, or any other serious injury?	*1=Yes; 2=No; 3= Doesn't know*	(Code)
D	You missed going to work, working in your home or doing any of your daily activities?	*1=Yes; 2=No; 3= Doesn't know*	(Code)

6.6	Have you ever hit, slapped, kicked, or done anything else to physically hurt your husband at times when he was not already beating or physically hurting you?	*1=Yes; If yes, continue with the next question* *2=No; If no, move to question 6.7*	(Code)
6.7	In the last 12 months, how often have you done that your husband?	*1= Often; 2=sometimes; 3=not at all*	(Code)
6.8	Does your husband drink alcohol?	*1=Yes; 2=No; 3= Doesn't know*	(Code)

6.9	Are you afraid of your husband: most of the time, sometimes or never?	*1=Most of the time; 2= Sometimes; 3= Never*	(Code)

6.10	From the time you were 15 years old has anyone other than your husband hit you, slapped you, kicked you, or done anything else to physically hurt you?	*1=Yes (if yes, continue to the next question) ; 2=No; 3= Refuse to answer; if no or refuse to answer, then go to question 6.14*	(Code)

6.11	Who hurt you in this way? anyone else? Record all mentioned		
A	Mother/step-mother	*1=Yes; 2=No;*	(Code)
B	Father/step-father	*1=Yes; 2=No;*	(Code)
C	Sister/brother	*1=Yes; 2=No;*	(Code)
D	Daughter/son	*1=Yes; 2=No;*	(Code)
E	Other relative	*1=Yes; 2=No;*	(Code)
F	Current boyfriend	*1=Yes; 2=No;*	(Code)
G	Former boyfriend	*1=Yes; 2=No;*	(Code)
H	Mother-in-law	*1=Yes; 2=No;*	(Code)
I	Father-in-law	*1=Yes; 2=No;*	(Code)
J	Other in-law	*1=Yes; 2=No;*	(Code)
K	Teacher	*1=Yes; 2=No;*	(Code)
L	Employer/someone at work	*1=Yes; 2=No;*	(Code)
M	Police/soldier	*1=Yes; 2=No;*	(Code)
N	Other	*Who?*	

If at least one yes, then continue to question 6.12. Otherwise thank and move to question 6.16.

6.12	Over the last 12 months, how often did this happen?	*1= Often; 2=sometimes; 3=not at all*	(Code)

6.13	Thinking about what you yourself have experienced among the different things we have been talking about, have you ever tried to seek help?	*1=Yes (if yes, continue to the next question) ; 2=No; 3= Refuse to answer; if no or refuse to answer, then thank and go to section 17*	(Code)

6.14	From whom you sought help? Anything else? Record all mentioned		
A	Own family	*1=Yes; 2=No;*	(Code)
B	Husband's/partner's family	*1=Yes; 2=No;*	(Code)
C	Current/former husband	*1=Yes; 2=No;*	(Code)
D	Current/former boyfriend	*1=Yes; 2=No;*	(Code)
E	Friend	*1=Yes; 2=No;*	(Code)
F	Neighbor	*1=Yes; 2=No;*	(Code)
G	Religious leader	*1=Yes; 2=No;*	(Code)

H	Doctor/medical personnel	*1=Yes; 2=No;*	(Code)
I	Police	*1=Yes; 2=No;*	(Code)
J	Lawyer	*1=Yes; 2=No;*	(Code)
K	Social service organization	*1=Yes; 2=No;*	(Code)
L	Other	*Specify*	(Code)

6.15	Have you ever told anyone about this?	*1=Yes; 2=No;*	(Code)
6.16	As far as you know, did your father ever beat your mother	*1=Yes; 2=No;*	(Code)
6.17	Did you have to interrupt the interview because some adult was trying to listen or came into the room, or interfered in any other way	*1=Yes; 2=No;*	(Code)

Thank the respondent for her cooperation and reassure her about the confidentiality of her answers.

19. Participation in the previous surveys

17	Did you or someone in your household participate in:		(Code)
17.01	The survey in 2000 of Ethiopian calendar (December 2007 Western calendar)?	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)
17.02	The survey in 2004 of the Ethiopian Calendar (May 2012 Western calendar)?	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)
17.03	The survey in 2008 of the Ethiopian Calendar (May 2015 Western calendar)	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)

20. Follow-up contact information

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

18.01	Would you mind being contacted for any follow-up questions? **(followup)**	*Yes=1 No=0*	(Code)
18.02	Do you have a mobile phone number? **(mob_own1)**	*Yes=1 No=0 if 'No' skip to* ***(mob_cont2)***	(Code)
18.03	If yes, is it ok if we contact you via this number? **(mob_cont1)**	*Yes=1 No=0 if 'No' ->END*	(Co)
18.04	If yes, what is the number? **(PII)**		(Integer)
18.05	Is there a second number from someone from the HH that we could use to contact you? **(mob_cont2)**	*Yes=1 No=0 if 'No' ->END*	(Code)
18.06	If yes, what is the number? **(PII)**		(Integer)

IRB # 20-0002

Appendix 12. Survey for Wives in Polygamous households – Short Questionnaire

EconInsights and Landesa

Impact Evaluation of Land Certification in Four Regions in Ethiopia Endline WIVE(S) Survey (Long Version)

S2-1	Questionnaire ID Number (HH ID) **(hh_id)**	(Integer)
S2-2	Enumerator ID **(enumerator_ID)**	(Numeric)
S2-3	Region **(killil)** *Tigray =1 Amhara =2 Oromia = 3 SNNP = 4*	(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)

Roster wives' respondents

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

Resp. ID	Name *Make a complete list of all the wives taking part in the wives questionnaire.*	How old are you? *Number of years*	For how many years have you been married? *Number of years*	What is the highest level of education you have received? *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*
wifeid	**PII**	**A.2**	**A.3**	**A.4**
1	**(w1_wifenm)**	**(w1_wifeage)**	**(w1_wifenyrmar)**	**(w1_wifeedu)**
2	**(w2_wifenm)**	**(w2_wifeage)**	**(w2_wifenyrmar)**	**(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). Regardless of their self-identification, if there is more than one wife, you will have to randomly assign a longer or shorter version of the wives' questionnaire to them.

If there is more than 1 wife, you will have to tell the wives that there is a short and a long version of the questionnaire, roll 'a dice and the wife will the smallest number will answer the shorter questionnaire. Tell them you can't share the content of the questions and they should not do that either.

Enumerator Note: in this questionnaire ''during the last 24 months'' refers to the time period from Yekatit 2010 to Tir 2012 in the Ethiopian Calendar and 'during last year' refers to the period from Yekatit 2011 to Tir 2012 in the Ethiopian Calendar.

Wife Questionnaire – Long Version (60 questions) – Fill in WIFE ID =

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 p**os**sess 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**	**parcw1lsit**	**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.

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

1.8	1.9	1.10	1.11	1.12	1.13a	1.13b
Who decides on what crops to grow on **[parcelid]**? *husband = 1* *Wife = 2* *Husband & wife = 3* *Children = 4* *Whole family = 5* *Other = 97*	Do you yourself make decisions regarding the use of the produce from **[parcelid]**? *No = 0* *Yes =1* *If 'yes' skip to parcw1rent*	Do you want to be allowed to make a decision regarding the use of the produce from **[parcelid]**? *No = 0* *Yes =1* *Prefer not to respond = 999*	Can you rent-out/sharecrop-out **[parcelid]**when you want? *No = 0* *Yes =1*	Do you make this decision to rent-out/sharecrop-out **[parcelid]**by yourself? *No = 0* *Yes =1*	Would you be willing to rent out **[parcelid]**to:	
					Close friends and family? *No = 0* *Yes =1*	A person outside of your close friends and family? *No = 0* *Yes =1*
parcw1dcrop	**parcw1duse**	**parcw1wduse**	**parcw1drent**	**parcw1wdrent**	**parcw1routf**	**parcw1routo**

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_lddiv2)** *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 certification take place in your kebele? **(w1_wiklcertyr)**	*year in EC*	(Numeric)
2.8	Did you participate in the kebele meetings that discussed the process of land certification in your kebele? **(w1lcertm2)**	*Yes=1 No= 0* *I have no idea about this = 3*	(Code)
2.9	If yes, when did you participate in the kebele meetings that discussed the process of land certification in your kebele? **(w1lcertmyr)**	*year in EC*	(Numeric)
2.10	Have you ever been elected and served in the kebele land administration committee? **(w1elect2)**	*Yes = 1 No= 0* *I have no idea about this = 3* *if '2' or '3' skip to* ***w1survpres***	(Code)
2.11	If yes, when were you elected to serve on the kebele land administration committee? **(w1electyr)**	*year in EC*	(Numeric
2.12	Were you present/consulted/interviewed by the surveyors when they came to measure your (also household's) land? **(w1survpres2)**	*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*	(Code)
2.13	When did the surveyors come to measure your (also household's) land? **(w1survpresyr)**	*year in EC*	(Numeric

SECTION 3: Land-related disagreements

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

Type ID	Type of disagreement	3.0. 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?		
	Enumerator: Probe and code, select all that apply.	*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_disphelpe2***)* 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)

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 – From Yekatit 2010 to Tir 2012).

3.9	3.10	3.11	3.12	3.13	3.14	3.15	3.16
During the last two years (24 MONTHS), were you involved in any land related disagreements on {parcel ID}? *Yes =1* *No = 2* *If No, Skip to next parcel*	What type of land related disagreement ? *(probe and code, see codes)*	How serious was the disagree ment? *(code)*	Was it resolved? *Yes =1* *No = 2* *If No, skip to w1dispref*	How was this dispute finally resolved? *Ask if w1dispres=1* *(code)*	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* *(code)*	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: 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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes=1 No=0* *I have no land in my name=3* *I do not know about the future=4*	(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)**	*Yes, it will improve my negotiation power=1* *No impact at all=2* *I do not know about it wait and see=3*	(Code)
4.5	How do you perceive/see the effect of land certification on women? **(w1_certperc)** *Enumerator: Read responses, probe and code selecting all that apply.*		

It will enhance women's bargaining power within the household **(w1_certperca2)** *Yes=1, No=0*	(Code)
It could bring economic independence to women **(w1_certpercc2)** *Yes=1, No=0*	(Code)
Other perceived effects? **(w1_certperce2)** *Yes=1, No=0*	(Code)
If Yes, specify	(Text)
I do not know about its effect yet **(w1_certpercd2)**	(Code)
Yes=1, No=0	
It will have no effect on women **(w1_certpercb2)** *Yes=1, No=0*	(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)**	*Very confident-1 Confident=2 Somewhat confident=3 Not at all confident=4*	
4.7	Do you think there are laws that adequately protect the land rights of women? **(w1_llawpw2)**	*Yes there are=1 No there are not=2* *I do not know about this issue=3*	(Code)
4.8	Do you think there are administrative/ judiciary institutions /arrangements that are CAPABLE of enforcing the land laws? **(w1_llawenf2)**	*Yes there are=1 No there are not=2 I do not know=3*	(Code)

SECTION 5. Decision Making

Enumerator: Please ensure that respondents know that nobody will judge his/her answers to the following questions.

Who usually decides how the money you earn will be used?	Would you say that the money that you earn is more than what your (spouse/partner) earns, less than what he earns, or about the same?	Who usually decides how your husband's earnings will be used?	Who usually makes decisions about health care for yourself?	Who usually makes decisions about making major household purchases?	Who usually makes decisions about visits to your family or relatives?	Do you own this or any other house either alone or jointly with someone else?	Do you have a title deed or other government recognized document for any house you own?	Is your name on this document?
5.1	**5.2**	**5.3**	**5.4**	**5.5**	**5.6**	**5.7**	**5.8**	**5.9**

1=Respondent alone 2= Spouse alone 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)	*1=More than him/her 2=Less than him/her 3=About the same 4=Spouse has no earning 5=Do not know*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Respondent 2= Spouse 3=Respondent and spouse jointly 4=Other household member 5=Other (specify)*	*1=Alone only 2=Spouse alone 3=Respondent and spouse jointly 4= Other household member 5=Does not own*	*1=Yes 2=No 3= Do not know*	*1=Yes, respondent alone 2=Yes, respondent and spouse's name 3=No, only spouse's name. 4= None 5=Don't know*	
(code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)	(Code)

Thank the respondent for her cooperation and reassure her about the confidentiality of her answers.

17. Participation in the previous surveys

17	Did you or someone in your household participate in:		(Code)
17.01	The survey in 2000 of Ethiopian calendar (December 2007 Western calendar)?	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)
17.02	The survey in 2004 of the Ethiopian Calendar (May 2012 Western calendar)?	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)
17.03	The survey in 2008 of the Ethiopian Calendar (May 2015 Western calendar)	1= the household but not me; 2= me, not the household; 3=the household and me; 4=doesn't know.	(Code)

18. Follow-up contact information

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

18.01	Would you mind being contacted for any follow-up questions? **(followup)**	*Yes=1 No=0*	(Code)
18.02	Do you have a mobile phone number? **(mob_own1)**	*Yes=1 No=0 if 'No' skip to* ***(mob_cont2)***	(Code)
18.03	If yes, is it ok if we contact you via this number? **(mob_cont1)**	*Yes=1 No=0 if 'No' ->END*	(Co)
18.04	If yes, what is the number? **(PII)**		(Integer)
18.05	Is there a second number from someone from the HH that we could use to contact you? **(mob_cont2)**	*Yes=1 No=0 if 'No' ->END*	(Code)
18.06	If yes, what is the number? **(PII)**		(Integer)

IRB # 20-0002

Appendix 13. Survey for Kebele/Village Authorities

EconInsights and Landesa

Impact Evaluation of Land Certification in Four Regions in Ethiopia

Kebele Authority Survey

SECTION A:

A1.	Unique Kebele ID **(kebeleID)**	(Numeric)	
A2.	Enumerator ID (**enumerator_ID)**	(Numeric)	
A3.	Zone **(czone)**		(Dynamic)
A4.	Region **(ckillil)**	*Tigray =1* *Amhara =2* *Oromia = 3* *SNNP = 4*	(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)	

Note: For this questionnaire, it is not necessary to re-interview the same respondents who participated in the 2011 Cloudburst Survey

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

SECTION B: ROSTER OF RESPONDENTS

ID	Respondent Name	Gender *1 = male* *2= female* *3=prefer not to respond*	How old are you? *number of years*	What position do you currently hold in this kebele? *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*	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* *6 = Religious school* *7 = IVET (Technical training)* *8 = Adult education* *9 = Diploma* *10 = Degree* *11 = Masters*	For how many years have you lived in this kebele? *number of years*
id	**(PII)**	**crsex**	**crage**	**crpos1**	**Credo**	**Cryrcom**
B1	**B2**	**B3**	**B4**	**B5**	**B7**	**B8**
1		(code)	(Code)	(Code)	(Code)	(Code)

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)**	*1=More moved in* *2=More moved out* *3=About the same of both* *4=Neither arrivals nor departures*	(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)**	*1 = 0%* *2 = 1-24%* *3 = 25-49%* *4 = 50-74%* *5 = 75-99%* *6 = 100%*	(Code)
C5	What is the most common use of land in this kebele? **(cluse)**	*1=Pasture* *2=Farming* *3=Planned Housing*	(Code)
C6	What is the topography of the land most like? **(ctopo)**	*1=Flat* *2=Slightly sloping* *3=Moderately sloping* *4=Steeply sloping* *5=Both flat and hilly*	(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)**	*1= 0%* *2= 1-24%* *3= 25-49%* *4=50-74%* *5=75-99%* *6=100%*	(Numeric)
C8	What percentage of the agricultural land in your kebele is in large scale farms? **(cagl)**	*1=0%* *2=1-24%* *3=25-49%* *4=50-74%* *5=75-99%* *6=100%*	(Code)
C9	What percentage of the land in your kebele is in forest, and not used for agriculture? **(cforl)**	*1=0%* *2=1-24%* *3=25-49%* *4=50-74%* *5=75-99%* *6=100%*	(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?
	Event Code *1=Drought* *2=Flood* *3=Crop disease/pests* *4=Livestock disease* *5=Human epidemic disease* *6=Displacement-related development activities* *7=Sharp change in prices* *8=Loss of key social services* *9=Massive job lay-offs* *10=Power outage(s)* *11=Development projects* *12=New employment opportunity* *13=New health facility* *14=New road* *15=New school* *16=Improved transportation services* *17=Improved electricity* *18=PSNP* *19=Frost* *20=Hailstorm* *21=Early Rain* *22=Heavy/too much rain* *23=Factory chemicals* *24=Shortage of clean Water* *25=Plant destruction* *26=Crop damage by animals* *27=Taxation* *28=Town expansion* *29=Poor mobile phone service*	*Season (See codes below)*	*Year (in EC)*	*1=0%* *2=1-24%* *3=25-49%* *4=50-74%* *5=75-99%* *6=100%*

C11 Cmewid	**C12 Cmewcode** (Event Code)	**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** POSITVELY 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?
	Event Code *1=Drought* *2=Flood* *3=Crop disease/pests* *4=Livestock disease* *5=Human epidemic disease* *6=Displacement-related development activities* *7=Sharp change in prices* *8=Loss of key social services* *9=Massive job lay-offs* *10=Power outage(s)* *11=Development projects* *12=New employment opportunity* *13=New healthfacility* *14=New road* *15=New school* *16=Improved transportation services* *17=Improved electricity* *18=PSNP* *19=Frost* *20=Hailstorm* *21=Early rain* *22=Heavy/too much rain* *23=Factory chemicals* *24=Shortage of clean water* *25=Plant destruction* *26=Crop damage by animals* *27= Taxation* *28=Town expansion* *29=Poor mobile phone service* *30=Irrigation* *31=Community Policing* *32=Improved clean/ drinking water supply* *33=Soil and water conservation* *34=Dam construction* *35=New technology* *36=Improved cell phone services*	*Season (See codes above)*	*Year (in EC)*	*1=0%* *2=1-24%* *3=25-49%* *4=50-74%* *5=75-99%* *6=100%*

Event id	Event Code			
Cmewidp	**Cmewcodep**	**Cmewscp**	**Cmewyrp**	**Cmewperp**
C18	**C19**	**C21**	**C22**	**C23**
1	cmewcodep_1	cmewscp_1	cmewyrp_1	cmewperp_1
2	cmewcodep_2	cmewscp_2	cmewyrp_2	cmewperp_2
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. *If not sure enter -99.* **(cdistpr)**	(Numeric)
D2	Can vehicles pass on the main road in this kebele throughout the whole year (i.e. even in the rainy season)? **(crstype)** *If Yes, Skip to question D.5* *1=Yes* *0=No*	(Code)
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)** *1=Yes* *2=No* *If 'Yes' skip to* ***(ccell)***	(Code)
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)** *1=Yes* *2=No*	(Code)
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)** *0=No* *1=Yes* *2=Not sure* *if 'No' skip to* ***(cnchurch)***	(Code)
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? *If not sure enter 888.* **(cphonedist)**	(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? *If not sure enter 888.* **(cgpsdist)**		
D20	What is the WALKING distance IN KILOMETERS from the kebele center to the nearest government **secondary** school serving this kebele? *If not sure enter 888.* **(cgssdist)**		(Numeric)
D21	Is there a commercial bank in this kebele? **(cbank)**	*1=Yes* *0=No* *if 'Yes' skip to* ***(cmic)***	(Code)
D22	What is the distance IN KILOMETERS from the kebele center to the nearest commercial bank? *If not sure enter -99.* **(cbankdist)**		(Numeric)
D23	Is there a micro-finance institution in this kebele? **(cmic)**	*1=Yes* *0=No* *if 'Yes' skip to* ***SECTION E***	(Code)
D24	What is the distance via roads in KILOMETERS from the kebele center to the nearest micro-finance institution? *If not sure enter 888.* **(cmicdist)**		(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?
	Activity code *(see below)*	*1=0%* *2=1-24%* *3=21-49%* *4=50-74%* *5=75-99%* *6=100%*
Cempid	**Cemp**	**Cempphh**
E1	**E2**	**E3**
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*
	11= Sand and stone sales
5=Beer brewing, kachasu	*12=Gold mining*
6=Handicraft production, small-scale industry	*13=PSNP*
	14=Construction
	15=Day labor/maid/casual worker

SECTION F: 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.

F1	In what year did the last OFFICIAL land redistribution take place in this kebele? (Ethiopian calendar year) **(colredyr)** *Enumerator: the last OFFICIAL land redistribution should have taken no later than year 1989 in EC*		(Numeric)
F2	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)
F3	In what year did the most recent UNOFFICIAL land redistribution take place? (Ethiopian calendar year) **(cuolredyr)** *Enter 888 if Don't know.*		(Interger)
F4	Does the woreda administration regulate watershed management in any parts of this kebele? **(cconsreq)**	*0=No* *1=Yes* *2=Not sure*	(Code)
F5	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)
F6	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)
F7	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)
F8	Where is the nearest land administration/land registry office located? **PII**		(text)
F9	How far is the nearest land administration office from this		(numeric)
F10	kebele in KILOMETERS when using **[clofftrmode]** as the mode of transportation? Enter '0' if is located in this kebele **(cloffdist)**		
F11	What mode of transportation is typically used for kebele residents when traveling to the nearest land administration office? **(clofftrmode)**	*1= on foot* *2= bicycle* *3= motorcycle* *4=tricycle (bajaj)* *5= car* *6= horse or mule* *7= cart (horse/mule/donkey)* *8= public transport/bus*	(code)

F12	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)
F13	What is the typical cost in BIRR of public transportation for someone to travel from this kebele to the nearest land administration office? **(cloffptrcst)** *Enter 888 if Don't know.*	(numeric)
F14	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)** *0=No 1=Yes 2=Not sure*	(Code)
F15	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)** *0=No 1=Yes 2=Not sure*	(Code)
F16	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)
F17	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)
F18	Has the farmland in this kebele been covered by any land certification activities? **(clcert)** *0=No 1=Yes 2=Not sure If 'No' Skip to **(cconf)***	(Code)
F19	Has FIRST LEVEL land certification taken place in your kebele? **(clcertf)** *ENUMERATOR: Please explain using example of first-level land certificate.* *0=No 1=Yes 2=Not sure If 'No' Skip to **(clcerts)***	(Code)
F20	In what year did activities towards FIRST LEVEL land certification start in this kebele? (Ethiopian calendar year) **(clcertfsyr)**	(Interger)
F21	In what year were FIRST LEVEL certificates issued in this kebele? (Ethiopian calendar year) **(clcertfyr)**	(Interger)
F22	Have any SECOND LEVEL land certification activities taken place in your kebele? **(clcerts)** *ENUMERATOR: Please explain using example of second-level land certificate.* *0=No 1=Yes 2=Not sure If no Skip to **(cconf)***	(Code)
F23	When did the SECOND LEVEL land registration and certification program start in your kebele your kebele? (Ethiopian calendar year) **(clcertsst)**	(Integer)
F24	Were public information meetings regarding second level land registration and certification held in the 6 months PRIOR to the program launch? **(clcertinfopre)** *0=No 1=Yes 2=Not sure*	(Code)

F25	In what year was the SURVEYING and REGISTRATION for SECOND LEVEL certification conducted? (Ethiopian calendar year) **(clcertssyr)**		(Numeric)
F26	Were public information meetings regarding second level land registration and certification held in the 6 months AFTER the program launch? **(clcertinfopost)**	*0=No 1=Yes 2=Not sure*	(Code)
F27	Have second level certificates been issued in this kebele? **(clcertsci)**	*0=No 1=Yes 2=Not sure If no Skip to **(cconf)***	(Code)
F28	In what YEAR were SECOND LEVEL land certificates ISSUED in this kebele? (Ethiopian calendar year) **(clcertsciyr)**		(Numeric)
F29	Are you aware of any of the following certification programs being implemented in this kebele:	*1=ELTAP 2= ELAP 3= LIFT 4=another certification program (name) 5=more than one of these 6= No*	
F30	Compared to 5 years ago, how has the number of land-related disagreements in your kebele changed? **(cconf)**	*1=Increased 2=Decreased 3=Remained the same*	(Code)

Section G: Supplemental Questions:

G1	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)**	*0=No 1=Yes 2=Not sure*	
G2	In what year did this start? **(clcertrevsyr)**	*(year in EC)*	
G3	In what year was this completed or expected to be completed? **(clcertfrevfyr)**	*(year in EC)*	
G4	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)**	*1=Yes 0=No*	

SECTION H. 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**
H1	**H2**	**H3**	**H4**	**H5**
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.

Enumerator: PLEASE answer the following question based on your observation.

I11	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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Appendix 7a. Focus Group Discussion Guide

FOCUS GROUP FOR WOMEN and MEN

Name of facilitator: _____
Name of note taker: _____
Date of FGD: _____
Sex of participants: _____
Number of men or women _____

Note to interviewer:

- Do not mix men and women in the focus groups!
- First, complete the informed consent process individually.
- Do not start the interview without ensuring that the participant has signed the consent form and has a copy.
- Ensure that you have a quiet, private place to conduct the FGD.
- Ensure that the note taker has notebooks and pens ready and that you have your illustrations and dice.

Introduction

As you know, we are doing a study to identify the effects of land certification for women and men in your village. We are very interested in your opinions and would like to ask questions about the most important changes you have noticed on the lives of men and women in your village as a result of obtaining land certificates. Please avoid giving personal examples if possible. There are no right or wrong answers. Your opinion will help us understand what women and men think worked well and what did not work so well with the land certification to make recommendations for program and policy improvements.

1. **WARM-UP**

Note to the facilitator: Participants should be comfortable when we start this activity; the question below aims to find a way to quickly relax them by taking their mind off their children or work routine. Please start by answering the question below yourself, and then have the note taker answer it, and then move quickly to the participants.

Question for participants:

1.1. Please, can you let us know your name and something fun about you, for example, do you have a favorite thing to do when you are not working? Do you have a favorite animal? Why is that your favorite?

SECTION 2. Setting up the activity by talking about land in the village

Note to the facilitator: Please, let participants know that now we are going to start talking about land in the village.

Question for participants:

2.1. In your village, who decides how to allocate agricultural land? Has that changed since 2010? In what year did the government start issuing land certificates in this village?

SECTION 3: IDENTIFYING THE MOST SIGNIFICANT CHANGE IN THE VILLAGE

Note to the facilitator: Use the illustrations we gave you to explain that we have identified some dimensions of a person's or a community's life that can change, for good, or bad, after women and men obtain land certificates. Show them the illustrations one by one. Please, state:
"We identified some dimensions of life that could be affected, in a positive or negative way, by having your name on a land certificate, and we will show you some pictures to illustrate what we mean. Later, we will ask you to tell us how change may, or may not, happen when you get your name on a land certificate in relation to any of these dimensions. I will show you illustrations that represent some of these dimensions."

Question to participants:

3.1. Can you tell me, which of these changes you have seen in people that received land certificates? Of all, which ones are the most significant in your opinion?

Note for Facilitator: Please, explain each of the ideas using the labels at the back of the illustrations:

a. Access to credit from banks, NGOs or formal institutions;
b. Number of Land disputes (incidence and time until resolution);
c. Land rental activity, including share-cropping;
d. Investment in productive assets;
e. Increased productivity;
f. Soil and water conservation investments;
g. Land tenure security;
h. Involvement in off-farm income generating activities;
i. Female empowerment and intra-household decision-making;
j. Risk of experiencing domestic violence

SECTION 4: Identifying how change happened

Note to the facilitator: Please, tell the participants: "Now, we want you to discuss the most significant changes you all have observed in the village for each of the pictures I showed you. Changes can be positive or negative"

Please keep in mind that participants should focus on speaking how change happened as a result of the certificate rather than something that was already happening. Please, ensure they cover details, otherwise, please feel free to ask them details, probing with:

- Why did that happen?
- Why do you say that?
- What effect did this have?

Enumerator, please repeat these questions for every picture you show the participants. Please, follow the order in which they are listed in the first section of this FGD guide.

Questions for participants:

4.1. Let's look at the first picture, what does this represent? (e.g., credit)
4.2. How is [what the picture represents] (e.g. obtaining credit) the result of having a person's name in the land certificate?
4.3. Does it work the same for men and women?
4.4. What if you are younger? Older?
4.5. For whom that doesn't it work that way?

Section 5: Specific interest questions

In addition to identifying what most important changes that you have seen in your village since the land certificates were issued, we are curious about some specific findings that the researchers could not understand during the study in 2015. We are hoping you can help us understand that:

5.1. Are there still any barriers for women or men to obtain land certificates? Can you give examples?
5.2. In the previous rounds of the study, researchers found that people with land certificates asked for more credit from individuals informally than from banks or NGOs, do you think that happened in this village? Why would people ask for informal loans instead of reaching a bank loan or one from an NGO?
5.3. For whom it is still difficult to use land, even with a certificate?
5.4. Do you have any questions or comments?

Thank you for your time and participation. If you have any questions about the study or wish to discuss anything further, please contact:
Mr. Alemayehu Woldu Gedrago at Kirkos Subcity , Woreda 03, call at +251 944 089 991, or at alemayehu.woldu@gmail.com

ANNEX 4: DID AND CT RESULTS TABLES

TABLE A4.1 DID RESULTS: AVERAGE IMPACT OF SECOND-LEVEL CERTIFICATION ON ACCESS TO CREDIT

	(1) Amount of credit taken for farming in past year (log Birr)	(2) HH took any credit for farming in past year	(3) HH used any form of land certificate to help secure credit
Year	0.051	0.004	-0.038
	(0.051)	(0.004)	(0.026)
ATE 2nd-level cert.	0.005	-0.002	0.042
	(0.082)	(0.009)	(0.027)
Constant	0.059***	0.008***	0.043***
	(0.020)	(0.002)	(0.006)
Households	989	989	989
R-squared	0.002	0.001	0.011

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects. Credit outcomes were not measured in the same way at baseline, so these results compare the endline to the follow-on survey, excluding treated households that were treated by endline.

TABLE A4.2. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON WHETHER HOUSEHOLDS USED LAND CERTIFICATE TO HELP SECURE CREDIT

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	0.002	-0.001	0.002	0.011***	0.008	0.012***
	(0.002)	(0.005)	(0.002)	(0.003)	(0.007)	(0.004)
Years^2	-0.000**	-0.000	-0.000	-0.001***	-0.001	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
FHH	0.006			0.009		
	(0.009)			(0.010)		
Households	2059	532	1817	2059	532	1817
Wald Chi-squared	33.291	17.742	8.574	24.251	16.621	28.929

TABLE A4.3 CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON AMOUNT OF CREDIT TAKEN USING LAND CERTIFICATE (LN(BIRR+1)), CONDITIONAL ON USING CERTIFICATE TO HELP SECURE CREDIT

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	-0.020*	-0.200***	-0.021**	0.036		0.002
	(0.010)	(0.000)	(0.008)	(0.039)		(0.004)
Years^2	0.003*	-0.000	0.003**	-0.004	-0.000	0.000
	(0.001)	(0.000)	(0.001)	(0.005)	(0.000)	(0.001)
FHH	0.006			0.012		
	(0.012)			(0.012)		
Households	95	24	78	95	24	78
Overall R-squared	0.381	0.000	0.288	0.356	0.096	0.276
Wald Chi-squared	158.440	.	349.559	79.360	.	327.574

TABLE A4.4. DID RESULTS: AVERAGE IMPACT OF SECOND-LEVEL CERTIFICATION ON LAND DISPUTES

	(1) Average time to resolve land dispute (log months)	(2) HH experienced land disputes related to boundaries or encroachment	(3) Wife experienced land disputes related to boundaries or encroachment
Year	-0.619	-0.052*	0.008
	(.)	(0.029)	(0.006)
ATE 2nd-level cert.	0.500	0.008	0.014*
	(0.508)	(0.030)	(0.009)
Constant	2.186***	0.083***	0.004**
	(0.064)	(0.006)	(0.002)
Households	343	2267	1890
R-squared	0.172	0.021	0.012

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

TABLE A4.5. CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON TIME TO RESOLVE A LAND DISPUTE (LOG(MONTHS+1))

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	-0.191***	-0.231***	-0.139*	-0.138	-0.287**	-0.174
	(0.065)	(0.053)	(0.075)	(0.089)	(0.146)	(0.117)
Years^2	0.006**	0.013***	0.003	-0.004	-0.006	-0.000
	(0.002)	(0.001)	(0.003)	(0.007)	(0.004)	(0.010)
FHH	-0.353			-0.777		
	(0.498)			(0.508)		
Households	416	94	329	416	94	329
Overall R-squared						
Wald Chi-squared	93.410	544.690	74.434	91.887	203.810	75.461

TABLE A4.6. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON WHETHER HOUSEHOLDS HAVE BOUNDARY DISPUTES

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	0.005	0.004	0.005	-0.002	-0.004	-0.000
	(0.003)	(0.007)	(0.004)	(0.004)	(0.009)	(0.004)
Years^2	-0.000	-0.000	-0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
FHH	0.029			0.027		
	(0.019)			(0.019)		
Households	2056	529	1814	2056	529	1814
Wald Chi-squared	66.078	28.355	59.549	63.826	29.991	49.719

TABLE A4.7 CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON WHETHER WIVES EXPERIENCED BOUNDARY DISPUTES

	Any Certificate	2nd-Level Certificate
Years	0.002	0.001
	(0.003)	(0.003)
Years^2	0.000	-0.000
	(0.000)	(0.000)
Polygynous	-0.008	-0.007
	(0.011)	(0.013)
Wives	657	657
Wald Chi-squared	47.251	31.093

TABLE A4.8 DID RESULTS: AVERAGE IMPACT OF SECOND-LEVEL CERTIFICATION ON LAND RENTAL ACTIVITY

	(1) Total area of land HH rented out (hectares)	(2) Total number of parcels HH rented out on monetary basis
Year	0.037**	0.090***
	(0.015)	(0.032)
ATE 2nd-level cert.	0.028	0.102***
	(0.023)	(0.039)
Constant	0.053***	0.115***
	(0.006)	(0.011)
Households	2267	2267
R-squared	0.008	0.034

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

TABLE A4.9 CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON NUMBER OF PARCELS RENTED OUT

	Any Certificate	2nd-Level Certificate				
	All	FHH	D/MHH	All	FHH	D/MHH
Years	0.013	0.007	0.022**	0.035**	0.014	0.043***
	(0.014)	(0.053)	(0.010)	(0.014)	(0.043)	(0.011)
Years^2	-0.000	-0.001	-0.000	-0.002	-0.002	-0.003***
	(0.000)	(0.002)	(0.000)	(0.002)	(0.005)	(0.001)
FHH	0.384***			0.383***		
	(0.071)			(0.071)		
Households	2059	532	1817	2059	532	1817
Overall R-squared	0.176	0.230	0.096	0.177	0.229	0.098
Wald Chi-squared	407.491	358.635	214.648	401.768	331.933	214.926

TABLE A4.10. CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON HECTARES RENTED OUT

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	0.009	0.009	0.011	0.017**	-0.012	0.024***
	(0.007)	(0.018)	(0.008)	(0.006)	(0.017)	(0.007)
Years^2	-0.000	-0.001	-0.000	-0.001**	0.001	-0.002***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)
FHH	0.141***			0.142***		
	(0.030)			(0.030)		
Households	2059	532	1817	2059	532	1817
Overall R-squared	0.068	0.164	0.032	0.069	0.162	0.033
Wald Chi-squared	322.384	316.709	247.111	317.780	294.431	203.799

TABLE A4.11. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON WHETHER HOUSEHOLD RENTED OUT LAND

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	0.009**	0.024*	0.008*	0.013***	0.009	0.013***
	(0.00r)	(0.013)	(0.004)	(0.005)	(0.014)	(0.004)
Years^2	-0.000	-0.001*	0.000	-0.001**	-0.002	-0.001**
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
FHH	0.149***			0.145***		
	(0.031)			(0.030)		
Households	2039	529	1797	2039	529	1797
Wald Chi-squared	859.347	148.801	481.071	825.330	165.087	452.668

TABLE A4.12. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON NUMBER OF TREES PLANTED

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	-0.221	-46.492	14.158	-17.406	-29.839	-13.810
	(15.049)	(32.680)	(16.494)	(16.722)	(23.920)	(19.643)
Years^2	-0.201	2.794	-0.960	2.136	2.565	2.037
	(0.791)	(1.700)	(0.872)	(1.476)	(1.690)	(1.746)
FHH	-82.974*			-82.995*		
	(48.112)			(48.861)		
Households	2059	532	1817	2059	532	1817
Overall R-squared	0.017	0.014	0.021	0.017	0.007	0.020
Wald Chi-squared	127.620	1636.632	142.927	122.789	1912.965	135.728

TABLE A4.13. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON NUMBER OF PERENNIALS PLANTED

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	-8.679	-32.836	-2.718	14.547	48.925	7.049
	(15.703)	(54.022)	(14.649)	(9.861)	(30.249)	(9.093)
Years^2	0.314	-0.749	0.558	-2.511**	-6.279	-1.736**
	(0.804)	(2.553)	(0.768)	(1.136)	(4.684)	(0.842)
FHH	6.323			8.946		
	(41.772)			(42.081)		
Households	2059	532	1817	2059	532	1817
Overall R-squared	0.096	0.120	0.138	0.095	0.123	0.135
Wald Chi-squared	5671.159	240.161	13006.187	7251.231	157.621	36970.510

TABLE A4.15. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON QUANTITY OF FERTILIZER AND PESTICIDE APPLIED (KG/HA)

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	24.779	-11.419	34.003	-3.517	-2.697	-3.953
	(25.660)	(12.656)	(31.573)	(3.519)	(10.706)	(3.745)
Years^2	-0.115	0.259	-0.219	0.628	0.561	0.687*
	(0.418)	(0.467)	(0.494)	(0.392)	(1.238)	(0.407)
FHH	-15.149			-23.784		
	(25.865)			(23.154)		
Households	2059	532	1817	2059	532	1817
Overall R-squared	0.046	0.101	0.045	0.042	0.100	0.040
Wald Chi-squared	24821.910	659.985	86078.795	72844.947	559.430	1.34e+05

TABLE A4.16. CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON LAND AREA RENTED IN (HECTARES)

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	-0.008	0.001	-0.010	-0.004	0.001	-0.005
	(0.008)	(0.001)	(0.010)	(0.004)	(0.001)	(0.005)
Years^2	0.000	-0.000	0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
FHH	-0.003			-0.002		
	(0.003)			(0.002)		
Households	2059	532	1817	2059	532	1817
Overall R-squared	0.004	0.023	0.005	0.005	0.017	0.006
Wald Chi-squared	27.142	3.790	24.683	29.046	2.805	26.702

TABLE A4.17. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON USE OF IMPROVED SEED

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	-0.009	-0.009	-0.009	0.007	0.019	0.004
	(0.009)	(0.012)	(0.010)	(0.012)	(0.016)	(0.013)
Years^2	0.001**	0.001	0.001**	-0.001	-0.003*	-0.001
	(0.000)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)
FHH	-0.129***			-0.131***		
	(0.029)			(0.029)		
Households	2059	523	1815	2059	523	1815
Wald Chi-squared	492.598	98.061	309.120	505.779	124.591	297.369

TABLE A4.18. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON USE OF OXEN OR TRACTORS

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	-0.011	-0.025*	-0.007	-0.005	0.012	-0.006
	(0.007)	(0.013)	(0.008)	(0.007)	(0.014)	(0.007)
Years^2	0.000	0.001	0.000	0.000	-0.001	0.000
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
FHH	-0.134***			-0.132***		
	(0.029)			(0.029)		
Households	2059	521	1817	2059	521	1817
Wald Chi-squared	1945.355	185.334	1560.063	1996.147	204.456	1525.576

TABLE A4.19. DID RESULTS: AVERAGE IMPACT OF CERTIFICATION ON WHETHER HOUSEHOLDS INVESTED IN SOIL OR WATER CONSERVATION

	(1) HH invested in soil or water conservation measures
Year	-0.136
	(0.089)
ATE 2nd-level cert.	0.125
	(0.091)
Constant	0.402***
	(0.020)
Households	2267
R-squared	0.019

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

TABLE A4.20 AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON INVESTMENT IN SOIL AND WATER CONSERVATION

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	0.014**	0.045***	0.006	0.005	0.025	0.000
	(0.007)	(0.014)	(0.009)	(0.009)	(0.017)	(0.010)
Years^2	-0.001*	-0.001**	-0.000	0.000	-0.001	0.000
	(0.000)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)
FHH	-0.043			-0.044		
	(0.034)			(0.034)		
Households	2059	530	1815	2059	530	1815
Wald Chi-squared	290.521	87.048	308.920	289.996	84.352	300.665

TABLE A4.21. DID RESULTS: AVERAGE IMPACT OF SECOND-LEVEL CERTIFICATION ON PERCEIVED LAND TENURE SECURITY

	(1) HH head believes they have heritable rights to bequeath land	(2) HH head believes land redistribution in kebele is likely	(3) HH head feels more secure in cred-based business transactions w/land certificate holder
Year	0.561***	-0.096	0.049
	(0.097)	(0.090)	(0.043)
ATE 2nd-level cert.	0.014	-0.050	0.052
	(0.096)	(0.092)	(0.045)
Constant	0.366***	0.253***	0.851***
	(0.022)	(0.019)	(0.010)
Households	2267	2267	2267
R-squared	0.525	0.051	0.039

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors reported in parentheses. All models include household fixed effects.

TABLE A4.22. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON PERCEIVED HERITABILITY OF LAND

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	-0.001	-0.005	-0.001	0.003	-0.001	0.002
	(0.006)	(0.010)	(0.007)	(0.007)	(0.011)	(0.007)
Years^2	-0.000	-0.000	0.000	-0.000	-0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
FHH	-0.035			-0.036		
	(0.041)			(0.041)		
Households	2059	530	1812	2059	530	1812
Wald Chi-squared	409.922	72.175	321.387	429.124	70.783	326.910

TABLE A4.23. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON PERCEIVED REDISTRIBUTION OF LAND IN NEAR FUTURE

	Any Certificate			2nd-Level Certificate		
	All	FHH	D/MHH	All	FHH	D/MHH
Years	0.009	0.006	0.010	0.011*	-0.010	0.019**
	(0.006)	(0.013)	(0.007)	(0.006)	(0.013)	(0.007)
Years^2	-0.001**	0.000	-0.001**	-0.001*	0.001	-0.002**
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
FHH	0.037			0.037		
	(0.041)			(0.025)		
Households	2059	532	1817	2059	532	1817
Wald Chi-squared	83.893	83.893	268.102	173.692	79.999	236.805

TABLE A4.24. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON FEELING MORE SECURE LENDING TO CERTIFICATE HOLDERS

	Any Certificate			2nd-Level Certificate	
	All	FHH	D/MHH	All	D/MHH
Years	-0.013**	-0.010	-0.014**	0.006	0.005
	(0.005)	(0.010)	(0.006)	(0.007)	(0.007)
Years^2	0.001*	0.000	0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
FHH	-0.064			-0.059	
	(0.052)			(0.052)	
Households	2059	532	1817	2059	1817
Wald Chi-squared	919.777	207.339	931.319	913.168	957.147

TABLE A4.25. DID RESULTS: AVERAGE IMPACT OF CERTIFICATION ON WOMEN'S LAND RIGHTS

	(1)	(2)	(3)	(4)	(5)	(6)
	WIFE POSSESSES LAND IN HER NAME	WIFE HAS CERTIFICATE FOR HER LAND	NUMBER OF PARCELS POSSESSED BY WIFE SOLELY OR JOINTLY	NUMBER OF PARCELS POSSESSED BY WIFE SOLELY	AREA OF LAND POSSESSED BY WIFE SOLELY OR JOINTLY (HECTARES)	AREA OF LAND POSSESSED BY WIFE SOLELY (HECTARES)
Year	0.447***	0.475***	1.818***	0.717***	1.865**	0.722*
	(0.097)	(0.068)	(0.456)	(0.250)	(0.827)	(0.390)
ATE 2nd-level certification	0.013	0.224***	0.894*	0.174	-0.606	-0.246
	(0.096)	(0.067)	(0.455)	(0.246)	(0.756)	(0.354)
Constant	0.477***	0.051***	1.366***	0.062	0.613***	0.037
	(0.022)	(0.015)	(0.110)	(0.059)	(0.183)	(0.088)
Wives	1890	1890	1890	1890	1890	1890
R-squared	0.373	0.607	0.330	0.213	0.200	0.136

Note: *, **, and *** denote statistical significance at the ten percent, five percent, and one percent levels, respectively. Standard errors are reported in parentheses. All models include wife-level fixed effects.

TABLE A4.26. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON WHETHER WIFE POSSESSES LAND

	Any Certificate	2nd-Level Certificate
Years	0.028***	0.035***
	(0.008)	(0.012)
Years^2	-0.002***	-0.003**
	(0.000)	(0.001)
Polygynous	-0.076**	-0.069*
	(0.035)	(0.038)
Wives	657	657

TABLE A4.27. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON WHETHER WIFE HAS CERTIFICATE OF TITLE FOR LAND IN HER POSSESSION

	Any Certificate	2nd-Level Certificate
Years	0.007	0.016
	(0.013)	(0.012)
Years^2	0.000	-0.002**
	(0.001)	(0.001)
Polygynous	-0.096**	-0.078**
	(0.038)	(0.039)
Wives	657	657

TABLE A4.28. CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON NUMBER OF PARCELS POSSESSED BY WIFE SOLELY OR JOINTLY WITH SPOUSES

	Any Certificate	2nd-Level Certificate
Years	0.182**	0.294***
	(0.037)	(0.080)
Years^2	-0.013***	-0.020**
	(0.003)	(0.009)
Polygynous	-0.533***	-0.340
	(0.204)	(0.219)
Wives	657	657

TABLE A4.29. CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON NUMBER OF PARCELS POSSESSED BY WIFE SOLELY

	Any Certificate	2nd-Level Certificate
Years	0.097***	0.042
	(0.037)	(0.046)
Years^2	-0.006***	-0.000
	(0.002)	(0.005)
Polygynous	-0.086	-0.073
	(0.124)	(0.122)
Wives	657	657

TABLE A4.30. CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON AREA OF LAND POSSESSED BY WIFE SOLELY OR JOINTLY WITH SPOUSES (HECTARES)

	Any Certificate	2nd-Level Certificate
Years	0.061	0.106***
	(0.049)	(0.040)
Years^2	-0.008***	-0.006
	(0.002)	(0.005)
Polygynous	0.254	0.250
	(0.296)	(0.299)
Wives	657	657

TABLE A4.31. CT RESULTS: AVERAGE IMPACT OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON AREA OF LAND POSSESSED BY WIFE SOLELY (HECTARES)

	Any Certificate	2nd-Level Certificate
Years	0.050***	0.025
	(0.019)	(0.021)
Years^2	-0.004***	-0.001
	(0.001)	(0.002)
Polygynous	0.038	0.021
	(0.094)	(0.092)
Wives	657	657

TABLE A4.32. DID RESULTS: AVERAGE IMPACT OF CERTIFICATION ON WIVES' DECISION-MAKING OVER LAND

	(1)	(2)	(3)	(4)
	WIFE DECIDES WHAT CROPS TO GROW ON HER LAND, SELF-REPORTED	WIFE DECIDES WHAT CROPS TO GROW ON HER LAND, HEAD-REPORTED	WIFE CAN RENT OUT HER LAND, SELF-REPORTED	WIFE CAN RENT OUT HER LAND, REPORTED BY HH HEAD
Year	0.536***	0.320***	0.191***	0.145
	(0.077)	(0.120)	(0.063)	(0.117)
ATE 2nd-level certification	0.071	-0.054	0.219***	0.047
	(0.080)	(0.123)	(0.068)	(0.122)
Constant	0.047***	0.469***	0.012	0.609***
	(0.016)	(0.024)	(0.014)	(0.023)
Wives	1890	1890	1890	1890
R-squared	0.547	0.151	0.352	0.067

Note: *, **, and *** denote statistical significance at the ten percent, five percent, and one percent levels, respectively. Standard errors reported in parentheses. All models include wife fixed effects.

TABLE A4.33. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON WHETHER WIFE CAN RENT OUT LAND IN HER POSSESSION AT HER DISCRETION, SELF-REPORTED

	Any Certificate	2nd-Level Certificate
Years	-0.020	0.009
	(0.013)	(0.012)
Years^2	0.002**	-0.002
	(0.001)	(0.001)
Polygynous	0.028	0.041
	(0.038)	(0.041)
Wives	657	657

TABLE A4.34. CT RESULTS: AVERAGE MARGINAL EFFECTS OF ANY- AND 2ND-LEVEL LAND CERTIFICATION ON WHETHER WIFE DECIDES WHAT CROPS TO GROW ON LAND IN HER POSSESSION, SELF-REPORTED

	Any Certificate	2nd-Level Certificate
Years	-0.031**	-0.006
	(0.013)	(0.012)
Years^2	0.002***	-0.002
	(0.001)	(0.001)
Polygynous	-0.013	-0.015
	(0.027)	(0.030)
Wives	657	657

ANNEX 5. SUMMARY COMPARATIVE RESULTS CLOUBURST REPORT, 2021 DID AND CT RESULTS

TABLE A5.1. SUMMARY RESULTS

Outcome	Coefficients for Treatment of Second-level Certification (Full/Partial)			Results of Continuous Treatment Analysis	
	Number of households or wives (2008-2021)	Average treatment effects (2008-2021)	Average treatment effects (2008-2015)	Effect of any certification (first-level or full second-level certification)	Effect of second-level certification (full)
FAMILY ACCESS TO CREDIT[47]					
Amount of credit taken for farming purposes in past year (ln(Birr+1))	989	0.005	0.89***	Not analyzed	
HH took any credit for farming purposes in past year (Y/N)	989	-0.002	0.13***	Not analyzed	
HH formally or informally used land as collateral to obtain credit (Y/N)	989	0.042	-0.06*	All HH: Probability increases Subsamples: Not significant for FHH, D/MHH	All HH: Probability increases, then decreases Subsamples: Not significant for FHH Same direction for all households, for D/MHH
Amount of credit taken using land certificate, conditional on taking credit using certificate (log Birr)	95	Not analyzed		All HH: Amount decreases, then increases Subsamples: Amount decreases for FHH Amount decreases, then increases for D/MHH	Not significant

[47] For the access to credit family of outcomes, we conduct the DID analysis using data from 2015 and 2021. We exclude households that had already been surveyed for or received second-level certification by the endline survey in 2015. As explained in the text, we cannot compare data from 2021 to 2008 for credit outcomes due to differences in how the data were collected.

Outcome	Coefficients for Treatment of Second-level Certification (Full/Partial)			Results of Continuous Treatment Analysis	
FAMILY LAND DISPUTES					
Average time to resolve a land dispute (ln(months+1))	343	.500	Not reported	All HH: Time decreases Subsamples: Time decreases for FHH and D/MHH	All HH: Not significant Subsamples: Time decreases for FHH Not significant for D/MHH
HH experienced land disputes related to boundaries or encroachment (Y/N)	2267	0.008	Not reported	Not significant	Not significant
Wife experienced land disputes related to boundaries or encroachment on her parcels (Y/N)	1890	0.014*	Not measured	Not significant	Not significant
FAMILY LAND RENTAL ACTIVITY					
Total area of land HH rented out (hectares)	2267	0.028	Not reported	Not significant	All HH: Increasing, then decreasing. Subsamples: Not significant for FHH Positive, then negative at year 13 for D/MHH
Total number of parcels HH rented out on a monetary basis	2267	0.102***	Not reported	All HH: Not significant Subsamples: FHH – NS Increasing for D/MHH	All HH: Increasing, then decreasing. Subsamples: Not significant for FHH Increasing, then decreasing for D/MHH
Probability of household renting any amount of land	Not analyzed			All HH: Increasing Subsamples: Increasing, then decreasing for FHH. Increasing for D/MHH	All HH: Increasing, then decreasing at year 14 Subsamples: Not significant for FHH Increasing, then decreasing at year 14 for D/MHH

Outcome	Coefficients for Treatment of Second-level Certification (Full/Partial)			Results of Continuous Treatment Analysis	
SOIL & WATER CONSERVATION					
HH invested in any soil or water conservation measures (Y/N)	2267	0.125	Not reported	All HH: Increase, then decrease at year 15 Subsamples: Increase for FHH Not significant for D/MHH	Not significant
FAMILY INVESTMENT IN AGRICULTURAL INPUTS					
Number of trees planted	Not analyzed			Not significant	Not significant
Number of perennials planted	Not analyzed			Not significant	All HH: Increase, then decrease at year 6 Subsamples: Not significant for FHH Increase, then decreased at year 5 for D/MHH
Quantity of fertilizer and pesticide applied (kg/ha)	Not analyzed			Not significant	All HH: Not significant Subsample: Not significant for FHH Decrease, then increase for D/MHH at year 6
Tractors and Oxen	Not analyzed			All HH: Not significant Subsamples: Decreasing, then increasing for FHH Not significant for D/MHH	Not significant
Improved Seeds	Not analyzed			All HH: Decrease, then increase at year 10 Subsamples: Not significant for FHH Decrease, then increase at year 10 for D/MHH	All HH: Not significant Subsamples: Increase, the, decrease at year 7 for FHH Not significant for D/MHH
Renting-in	Not analyzed			Not significant	Not significant

Outcome	Coefficients for Treatment of Second-level Certification (Full/Partial)			Results of Continuous Treatment Analysis	
FAMILY PERCEIVED LAND TENURE SECURITY					
HH head believes they have heritable right to bequeath land (Y/N)	2267	0.014	0.11**	Not significant	Not significant
HH head believes land redistribution in *kebele* is likely (Y/N)	2267	-0.050	Not reported	All HH: Increase, then decrease at year 10 Subsample: Not significant for FHH – NS Increase, then decrease at year 11 for D/MHH	All HH: Increase, then decrease at year 2 Subsample: Not significant for FHH Increase, then decrease at year 3 for D/MHH
HH head feels more secure in credit-based business transactions w/ land certificate holder (Y/N)	2267	0.052	Not reported	All HH: Decrease, then increase at year 14 Subsamples: Not significant for FHH Decrease, then increase at year 15 for D/MHH	Not significant

TABLE A5.2. SUMMARY RESULTS FOR WOMEN EMPOWERMENT OUTCOMES

OUTCOME	COEFFICIENTS FOR TREATMENT OF SECOND-LEVEL CERTIFICATION (FULL/PARTIAL)			RESULTS OF CONTINUOUS TREATMENT ANALYSIS	
	NUMBER OF HOUSEHOLDS OR WIVES (2008-2021)	AVERAGE TREATMENT EFFECTS (2008-2021)	AVERAGE TREATMENT EFFECTS (2008-2015)	EFFECT OF ANY CERTIFICATION (FIRST-LEVEL OR FULL SECOND-LEVEL CERTIFICATION)	EFFECT OF SECOND-LEVEL CERTIFICATION (FULL)
Wife possesses land in her name (Y/N)	1890	0.013	Not reported	Positive, then negative at year 15	Positive, then negative at year 12
Wife has certificate of title for land in her possession (Y/N)	1890	0.224***	Not reported	Not significant	Positive, then negative at year 9
Number of parcels possessed by wife solely or jointly with spouse	1890	0.894*	Not reported	Positive, then negative at year 15	Positive (increasing, then decreasing)
Number of parcels possessed by wife solely	1890	0.174	Not reported	Positive, then negative at year 17	Not significant
Area of land possessed by wife solely or jointly with spouse (hectares)	1890	-0.606	Not reported	Positive, then negative at year 8	Positive (increasing, then decreasing)
Area of land possessed by wife solely (hectares)	1890	-0.246	Not reported	Positive, then negative at year 13	Not significant
Wife decides what crops to grow on land in her possession,	1890	0.071	Not reported	Negative, then positive at year 11	Not significant

Outcome	Coefficients for Treatment of Second-level Certification (Full/Partial)			Results of Continuous Treatment Analysis	
self-reported (Y/N)					
Wife decides what crops to grow on land in her possession, as reported by HH head (Y/N)	1890	-0.054	Not reported	Not analyzed	
Wife can rent out land in her possession at her discretion, self-reported (Y/N)	1890	0.219***	Not reported	Negative, then positive at year 16	Not significant
Wife can rent out land in her possession at her discretion, as reported by HH head (Y/N)	1890	0.047	Not reported	Not analyzed in the CT	Not analyzed in the CT

Note: *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels. Cloudburst did not report DID coefficients for any of the results that were not statistically significant. For technical reasons, we excluded from the survey the question regarding whether the household head believes land certificate program will have positive impact on land investment.

ANNEX 6. MARGINAL EFFECTS ON PROBABILITY OF WOMEN EXPERIENCING IPV MODELS 1-3 FOR ANY CERTIFICATION AND SECOND-LEVEL CERTIFICATION

TABLE A6.1 MARGINAL EFFECTS ON PROBABILITY OF WOMAN EXPERIENCING ANY IPV

Co-Variates	Model 1		Model 2		Model 3	
	Marg. Eff.	Std. error	Marg. Eff.	Std. error	Marg. Eff.	Std. error
Polygyny	0.1545**	0.0498	0.1543**	0.0499	0.1522**	0.0499
Wife's age	0.0003	0.0013	0.0003	0.0013	0.0003	0.0013
Age gap	0.0007	0.0015	0.0007	0.0015	0.0007	0.0015
Age at First Cohabitation	-0.0056*	0.0026	-0.0056*	0.0026	-0.0057*	0.0026
Wife is literate	-0.0272	0.0309	-0.0272	0.0309	-0.0256	0.0311
husband is literate	-0.0315	0.0261	-0.0314	0.0261	-0.0313	0.0261
Wife Worked Off Farm	0.0104	0.0334	0.0106	0.0335	0.0105	0.0335
Husband Worked Off Farm	0.1258**	0.0377	0.1256**	0.0378	0.1262**	0.0378
Woman Owns a Home	0.2550***	0.0544	0.2551***	0.0544	0.2598***	0.0547
Woman with Home Title	-0.0176	0.0502	-0.0177	0.0503	-0.0146	0.0509
Woman with her Name on Home Title	-0.1282**	0.0495	-0.1283*	0.0495	-0.1244**	0.0503
Woman Participates in Decision Making	-0.0245	0.0564	-0.0247	0.0564	-0.0234	0.0564
Husband Helps on HH Chores	-0.2365***	0.0265	-0.2364***	0.0265	-0.2355***	0.0266
Index of Justification of Violence	0.1956***	0.0384	0.1957***	0.0384	0.1959***	0.0384
Index of Controlling Behaviors by Husband	0.4573***	0.0558	0.4572***	0.0558	0.4581***	0.0557
Wealth index	-0.0125	0.0122	-0.0125	0.0122	-0.0123	0.0122
Large Assets	-0.0005	0.0032	-0.0005	0.0032	-0.0004	0.0032
Area of Land Owned by HH	-0.0028	0.0039	-0.0027	0.0039	-0.0027	0.0039
Region (compared to Amhara)						
Oromia	0.0979*	0.0330	0.0987**	0.0342	0.1011**	0.0343
SNNP	-0.1558***	0.0423	-0.1553***	0.0427	-0.1546***	0.0427
Household with Second-Level Certification			**-0.0026**	**0.0271**	**0.0144**	**0.0428**
Wife's Name is on Second-Level Certificate					**-0.0221**	**0.0413**
Wives	1328		1328		1328	
Log likelihood	-780.28183		-780.2776		-780.12791	

Note: *** p<0.01, ** p<.0.05, * p< 0.10

TABLE A6.2 MARGINAL EFFECTS ON PROBABILITY OF WOMAN EXPERIENCING EMOTIONAL IPV

	Model 1		Model 2		Model 3	
Co-Variates	Marg. Eff.	Std. error	Marg. Eff.	Std. error	Marg. Eff.	Std. error
Polygyny	0.0877*	0.0462	0.0901*	0.0463	0.0790*	0.0462
Wife's age	-0.0011	0.0012	-0.0012	0.0012	0.0006	0.0012
Age gap	-0.0004	0.0015	-0.0004	0.0016	0.0004	0.0016
Age at First Cohabitation	-0.0056*	0.0025	-0.0056*	0.0025	0.0059*	0.0025
Wife is literate	0.0331	0.0304	0.0333	0.0303	0.0440	0.0305
husband is literate	-0.0271	0.0252	-0.0277	0.0252	0.0260	0.0251
Wife Worked Off Farm	0.0162	0.0317	0.0142	0.0319	0.0142	0.0317
Husband Worked Off Farm	0.0730*	0.0338	0.0738*	0.0339	0.0768*	0.0336
Woman Owns a Home	0.1230**	0.0481	0.1231**	0.0480	0.1481**	0.0456
Woman with Home Title	-0.1288**	0.0411	-0.1278**	0.0412	0.1089**	0.0412
Woman with her Name on Home Title	-0.0902*	0.0443	-0.0893*	0.0442	0.0644	0.0434
Woman Participates in Decision Making	-0.0281	0.0528	-0.0261	0.0528	0.0168	0.0521
Husband Helps on HH Chores	-0.2027***	0.0270	-0.2031***	0.0270	0.1975***	0.0268
Index of Justification of Violence	-0.0477	0.0370	-0.0480	0.0370	-0.0473	0.0368
Index of Controlling Behaviors by Husband	0.5497***	0.0469	0.5497***	0.0469	0.5556***	0.0467
Wealth index	-0.0107	0.0120	-0.0108	0.0120	0.0102	0.0121
Large Assets	-0.0022	0.0033	-0.0024	0.0033	-0.0019	0.0033
Area of Land Owned by HH	0.0025	0.0045	0.0022	0.0044	0.0022	0.0047
Region (compared to Amhara)						
Oromia	0.2519***	0.0360	0.2430***	0.0376	0.2605***	0.0374
SNNP	0.1204**	0.0441	0.1162**	0.0444	0.1206**	0.0440
Household with Second-Level Certification			**0.0239**	**0.0272**	**0.1171****	**0.0380**
Wife's Name is on Second-Level Certificate					**-0.1254****	**0.0376**
Wives	1328		1328		1328	
Log likelihood	-757.80601		-757.42838		-752.05522	

Note: p<0.01, ** p<.0.05, * p< 0.10

TABLE A6.3 MARGINAL EFFECTS OF CO-VARIATES IN THE PROBABILITY OF WOMEN EXPERIENCING PHYSICAL OR SEXUAL IPV

	Model 1		Model 2		Model 3	
Co-Variates	Marg. Eff.	Std. error	Marg. Eff.	Std. error	Marg. Eff.	Std. error
Polygyny	0.1171**	0.0473	0.1191**	0.0472	0.1231**	0.0471
Wife's age	0.0024*	0.0013	0.0024*	0.0013	0.0022*	0.0013
Age gap	-0.0001	0.0015	-0.0001	0.0015	-0.0001	0.0015
Age at First Cohabitation	-0.0048*	0.0028	-0.0048*	0.0028	-0.0047*	0.0028
Wife is literate	-0.0447	0.0313	-0.0447	0.0313	-0.0482	0.0313
husband is literate	-0.0098	0.0259	-0.0106	0.0259	-0.0109	0.0258
Wife Worked Off Farm	0.0044	0.0327	0.0028	0.0328	0.0032	0.0328
Husband Worked Off Farm	0.1126**	0.0355	0.1139**	0.0356	0.1130**	0.0357
Woman Owns a Home	0.2712***	0.0454	0.2711***	0.0455	0.2631***	0.0468
Woman with Home Title	0.0173	0.0504	0.0183	0.0505	0.0117	0.0507
Woman with her Name on Home Title	-0.2027***	0.0485	-0.2014***	0.0485	-0.2092***	0.0487
Woman Participates in Decision Making	-0.0816	0.0569	-0.0789	0.0571	-0.0818	0.0571
Husband Helps on HH Chores	-0.2271***	0.0275	-0.2276***	0.0274	-0.2297***	0.0274
Index of Justification of Violence	0.2562***	0.0368	0.2557***	0.0367	0.2551***	0.0366
Index of Controlling Behaviors by Husband	0.4406***	0.0527	0.4410***	0.0526	0.4403***	0.0525
Wealth index	-0.0070	0.0122	-0.0070	0.0122	-0.0073	0.0121
Large Assets	0.0004	0.0032	0.0003	0.0032	0.0001	0.0032
Area of Land Owned by HH	-0.0054	0.0049	-0.0058	0.0050	-0.0060	0.0053
Region (compared to Amhara)						
Oromia	-0.0794**	0.0328	-0.0875**	0.0340	-0.0927**	0.0341
SNNP	-0.2664***	0.0355	-0.2700***	0.0358	-0.2715***	0.0357
Household with Second- Level Certification			**0.0252**	**0.0277**	**-0.0100**	**0.0423**
Wife's Name is on Second-Level Certificate					**0.0459**	**0.0400**
Wives	1328		1328		1328	
Log likelihood	-782.35038		-781.93997		-781.29346	

Note: p<0.01, ** p<.0.05, * p< 0.10

TABLE A6.4 MARGINAL EFFECTS ON PROBABILITY OF WOMAN EXPERIENCING ANY IPV, USING DHS ELTAP SAMPLE

	Model 1		Model 2		Model 3	
Co-Variates	Marg. Eff.	Std. error	Marg. Eff.	Std. error	Marg. Eff.	Std. error
Polygyny	0.1964***	0.0473	0.1940***	0.0496	0.1944***	0.0497
Wife's age	0.0051**	0.0016	0.0044**	0.0017	0.0044**	0.0017
Age gap	-0.0007	0.0016	-0.0003	0.0016	-0.0003	0.0016
Age at First Cohabitation	-0.0113**	0.0037	-0.0110**	0.0035	-0.0110**	0.0035
Wife is literate	0.0496	0.0371	0.0552	0.0380	0.0558	0.0380
Husband is literate	0.0342	0.0342	0.0266	0.0350	0.0269	0.0351
Wife Worked Off Farm	0.0252	0.0310	0.0370	0.0299	0.0363	0.0300
Husband Worked Off Farm	0.0130	0.0491	0.0251	0.0485	0.0248	0.0484
Woman Owns a Home	0.0814*	0.0437	0.1147**	0.0407	0.1177**	0.0405
Woman with Home Title	0.1161**	0.0436	0.0677	0.0554	0.0623	0.0569
Woman with her Name on Home Title	-0.1133*	0.0444	-0.1323**	0.0495	-0.1249*	0.0583
Woman Participates in Decision Making	0.1705**	0.0590	0.1464	0.0603	0.1484*	0.0612
Husband Helps on HH Chores	-0.1627***	0.0361	-0.1627***	0.0365	-0.1624***	0.0365
Index of Justification of Violence	0.0389	0.0463	0.0614	0.0476	0.0620	0.0475
Index of Controlling Behaviors by Husband	0.5409***	0.0595	0.5335***	0.0602	0.5339***	0.0603
Wealth index	-0.0033	0.0158	-0.0007	0.0145	-0.0006	0.0146
Large Assets	-0.0048	0.0045	-0.0069	0.0044	-0.0069	0.0044
Area of Land Owned by HH	-0.0082**	0.0026	-0.0077**	0.0027	-0.0076**	0.0026
Region (compared to Amhara)						
Oromia	0.0850**	0.0390	0.0628*	0.0370	0.0642*	0.0372
SNNP	-0.0961**	0.0452	-0.1226**	0.0443	-0.1224**	0.0444
Household with any land certification			**0.1263***	**0.0583**	**0.1372***	**0.0557**
Wife's Name is on a Land Certificate					**-0.0156**	**0.0360**
Wives	2614		2614		2614	
Log likelihood	-1902.9484		-1882.6954		-1882.546	

Note: p<0.01, ** p<.0.05, * p< 0.10

TABLE A6.5. MARGINAL EFFECTS ON PROBABILITY OF WOMAN EXPERIENCING EMOTIONAL IPV, USING DHS ELTAP SAMPLE

	Model 1		Model 2		Model 3	
Co-Variates	Marg. Eff.	Std. error	Marg. Eff.	Std. error	Marg. Eff.	Std. error
Polygyny	0.1306**	0.0433	0.1310**	0.0437	0.1329**	0.0442
Wife's age	0.0041**	0.0014	0.0039**	0.0014	0.0042**	0.0014
Age gap	0.0011	0.0014	0.0012	0.0014	0.0012	0.0014
Age at First Cohabitation	-0.0118***	0.0033	-0.0118***	0.0033	-0.0121***	0.0033
Wife is literate	0.0588*	0.0311	0.0597*	0.0303	0.0623**	0.0305
husband is literate	0.0267	0.0307	0.0259	0.0313	0.0276	0.0313
Wife Worked Off Farm	0.0007	0.0280	0.0032	0.0271	0.0004	0.0273
Husband Worked Off Farm	-0.0267	0.0444	-0.0253	0.0450	-0.0268	0.0452
Woman Owns a Home	0.0764*	0.0367	0.0818**	0.0338	0.0922**	0.0329
Woman with Home Title	0.1885***	0.0484	0.1812**	0.0571	0.1609**	0.0613
Woman with her Name on Home Title	-0.1689**	0.0526	-0.1729**	0.0517	-0.1436**	0.0620
Woman Participates in Decision Making	0.0820	0.0501	0.0782**	0.0522	0.0876*	0.0526
Husband Helps on HH Chores	-0.1498***	0.0349	-0.1502***	0.0348	-0.1491***	0.0347
Index of Justification of Violence	-0.0818**	0.0414	-0.0777*	0.0440	-0.0752*	0.0435
Index of Controlling Behaviors by Husband	0.5524***	0.0452	0.5500***	0.0449	0.5518***	0.0454
Wealth index	-0.0006	0.0131	0.0000	0.0128	0.0007	0.0128
Large Assets	-0.0051	0.0040	-0.0056	0.0039	-0.0055	0.0039
Area of Land Owned by HH	-0.0038*	0.0021	-0.0037*	0.0022	-0.0035	0.0022
Region (compared to Amhara)						
Oromia	0.1359***	0.0383	0.1319***	0.0371	0.1385***	0.0376
SNNP	0.0349	0.0398	0.0299	0.0398	0.0302	0.0399
Household with any land Certification			**0.0223**	**0.0522**	**0.0660**	**0.0527**
Wife's Name is on any land Certificate					**-0.0641***	**0.0351**
Wives		2614		2614		2614
Log likelihood		-1700.8944		-1700.1804		-1697.1467

Note: p<0.01, ** p<.0.05, * p< 0.10

TABLE A6.6 MARGINAL EFFECTS OF CO-VARIATES ON THE PROBABILITY OF EXPERIENCING PHYSICAL AND SEXUAL IPV - DHS ELTAP MATCHED

	Model 1		Model 2		Model 3	
Co-Variates	Marg. Eff.	Std. error	Marg. Eff.	Std. error	Marg. Eff.	Std. error
Polygyny	0.1599***	0.0421	0.1562***	0.0436	0.1562***	0.0435
Wife's age	0.0056**	0.0016	0.0050**	0.0017	0.0050**	0.0017
Age gap	-0.0006	0.0016	-0.0002	0.0016	-0.0002	0.0016
Age at First Cohabitation	-0.0119**	0.0038	-0.0116**	0.0037	-0.0115**	0.0037
Wife is literate	0.0659*	0.0373	0.0692*	0.0381	0.0689*	0.0381
husband is literate	0.0663*	0.0341	0.0609*	0.0352	0.0607*	0.0353
Wife Worked Off Farm	0.0453	0.0308	0.0538*	0.0299	0.0542*	0.0300
Husband Worked Off Farm	-0.0096	0.0482	-0.0018	0.0478	-0.0017	0.0477
Woman Owns a Home	0.1259**	0.0412	0.1502***	0.0380	0.1489***	0.0381
Woman with Home Title	0.0940*	0.0422	0.0565	0.0530	0.0593	0.0533
Woman with her Name on Home Title	-0.1380**	0.0421	-0.1504**	0.0461	-0.1540**	0.0531
Woman Participates in Decision Making	0.0843	0.0558	0.0640	0.0586	0.0630	0.0597
Husband Helps on HH Chores	-0.1336***	0.0373	-0.1334***	0.0379	-0.1335***	0.0379
Index of Justification of Violence	0.0846	0.0448	0.1008	0.0469	0.1005	0.0467
Index of Controlling Behaviors by Husband	0.4440***	0.0552	0.4364***	0.0560	0.4362***	0.0559
Wealth index	0.0083	0.0149	0.0104	0.0141	0.0103	0.0141
Large Assets	-0.0055	0.0043	-0.0073*	0.0042	-0.0073*	0.0042
Area of Land Owned by HH	-0.0073**	0.0028	-0.0069*	0.0029	-0.0069*	0.0029
Region (compared to Amhara)						
Oromia	-0.0134	0.0398	-0.0304	0.0378	-0.0311	0.0380
SNNP	-0.1429**	0.0423	-0.1623***	0.0416	-0.1624***	0.0416
Household with Any Land Certification			**0.0952**	**0.0583**	**0.0896**	**0.0555**
Wife's Name is on Any Land Certificate					**0.0080**	**0.0347**
Wives	2614		2614		2614	
Log likelihood	-1859.061		-1847.0527		-1847.012	

Note: p<0.01, ** p<.0.05, * p< 0.10