

Improvement of Land Governance in Uganda: Mailo tenant endline evaluation

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1 Introduction

The World Bank is implementing an impact evaluation (IE) of land governance interventions on Mailo land by the German Agency for International Cooperation's (GIZ's) Improvement of Land Governance in Uganda (ILGU) pilot project. ILGU began implementation in 2017 and completed the pilot activities that are the subject of this report in 2023. Mailo is a type of customary land tenure that was created and semi-formalized during the colonial period, creating landlords and tenants. Mailo lands, which are mostly found in central Uganda close to Kampala, are prone to tenure insecurity and high levels of dispute that are further exacerbated by rising land values. ILGU's goal is to increase the productivity and income of small-scale farmers on Mailo land by piloting interventions to strengthen land tenure security. The pilot interventions include land inventories (including a low-cost land survey using systematic demarcation), conflict mediation, and facilitating agreements with landlords. ILGU interventions were completed in coordination with the Government of Uganda.

ILGU requested that the World Bank undertake a comprehensive IE of the ILGU pilot. The IE design is based on a geographic discontinuity approach on the sub-county borders; approximately 200 treatment and control enumeration areas (EAs) were randomly selected around the sub-county borders. A listing was undertaken to identify Mailo tenants who were cultivating land in the selected EAs and their landlords, and 2,800 households were randomly selected and interviewed at baseline. Also, those landlords living in the sampled EAs were interviewed. Baseline data were collected in 2017, and endline data collection took place in 2023.

This initial report presents the endline findings of the impact of the ILGU program on land documentation, busuulu payment, knowledge and awareness, land rights, perceived

tenure security, conflict, and land-related investment.

1.1 Summary of Findings

Figure 1: Summary of Evaluation Findings

Overall Summary of Evaluation Findings by Outcome

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH
Documentation	Improvement	Improvement	Improvement
Knowledge	No change	No change	No change
Bussulu payment	Partial improvement	Partial improvement	Partial improvement
Land rights	Improvement	Improvement	Improvement
Tenure security	No change	No change	Improvement
Expropriation	Improvement	No change	Improvement
Land conflict	Improvement	Improvement	Improvement
Investments	(Weak) Mixed	Partial improvement	No change
Credit and loans	Partial improvement	Mixed	No change
Rental and land markets	Partial improvement	No change	Partial improvement
Livelihoods	No change	Partial improvement	Improvement

Sample characteristics: The total panel household sample size is 1,594, with 60 percent of the sample in treatment areas and 40 percent of the sample in control areas. Thirty-five percent (558) of respondents are female heads of household. Approximately 54 percent of the sample report that they were born in the village where they reside. Seventy percent of respondents report that the household has Mailo ownership/tenure rights to the parcel where the residence is located. However, there is a significant difference between treatment and control respondents: 58 percent of control respondents versus 78 percent of treatment respondents report that their residence is on a parcel that is under Mailo tenure.

Overall, 70 percent of respondents report that the household has Mailo ownership/tenure rights to the parcel where the residence sits. However, there is a significant difference between treatment and control respondents; 58 percent of control respondents versus 78 percent of treatment respondents report that their *residence* is on a parcel that is under Mailo tenure.

Overall, 76 percent of respondents report that they are Mailo tenants/kibanja holders, 11 percent report that they are the landlord of the parcel, and 14 percent report that they are neither the landlord nor the kibanja holder. A larger portion of control respondents are

not on kibanja land (neither as landlords nor as kibanja holders), thus as per the tenure indicator above, there are a slightly greater number of respondents that note that they are Mailo tenants among treatment respondents (78 percent versus 72 percent). However, the reported landlords between the two groups are similar: 10 percent in treatment and 11 percent in control.

Significantly more treatment respondents know their landlord-71 percent treatment compared to 57 percent control. Among those who know their landlord, 71 percent of treatment respondents and 65 percent of control respondents report that they are not related to the landlord.

Program participation: Overall, mapping was not entirely systematic across ILGU communities, and among those mapped by ILGU, not all received a Land Inventory Protocol (LIP). Within the treatment group, 43 percent (414) of respondents in the sample report that they participated in ILGU; 93 percent of those with a map are in the designated treatment area, which indicates a low level of deviation from the original research design. Among those who participated in ILGU, 72 percent (355) of those mapped by ILGU have a LIP.

Overall, the analysis finds that baseline treatment indicators of total household wealth and farming revenue are more predictive of eventual ILGU-mapping status than baseline survey items that track experience with or proximity to land conflict. Those who were eventually mapped by ILGU paid a higher amount of busuulu, had slightly larger landholdings, and reported a slightly higher value of crops already sold at the time of their interview. Among those mapped by ILGU, respondents who eventually received a LIP have more landholdings and better-quality dwellings. Essentially, the evidence indicates that those who were better off were modestly more likely to ultimately receive a LIP.

The baseline balance between treatment and control households is good for many outcomes as, statistically most indicators are balanced. For those variables that are imbalanced, the magnitude of the imbalance is small (i.e., below an absolute standardized mean difference of .25). In terms of the imbalanced indicators, households in the treatment area are more likely to have a bank account, engage in wage labor, have paid busuulu in the past, and have experienced a conflict in the past five years.

Relationship to landlords: The analysis examined differential effects for those tenants who were related to at least one of their landlords. Landlord relation was an important factor in reported land rights and the prevalence of conflicts. Moreover, among ILGU beneficiaries, those with a landlord relative reported stronger land rights and fewer land conflicts. Importantly, the study also finds that, in contrast with the aggregate and subgroup results

for women, youth, and large landholders, tenants in treatment areas who are related to a landlord are *not* more likely than those in comparison areas to have paid their busuulu payment over the past five years. Those related to landlords are much more likely to report that they would pay the landlord to own the parcel.

Program documentation: The impact analysis indicates that ILGU participants are approximately 14 percentage points more likely to have ownership or use-rights documentation for their parcels-and this is approximately 20 percentage points higher for women. In the analysis of documentation, however, the study uncovered a significant amount of confusion and lack of awareness about documentation for land rights. As highlighted throughout this report, the lack of knowledge and awareness extended to several topics related to land and tenure rights.

Specifically, 58 percent of respondents noted that their household has a "formal" ownership/user rights document for the parcel that their *residence* is on (59 percent control, 57 percent treatment). When focusing on ILGU beneficiaries, the study reveals that 54 percent of control versus 67 percent of treatment respondents note that they have formal ownership/user rights for the parcel. However, when looking at the actual categories of documents secured, many respondents are not aware or knowledgeable of formal versus informal documents. Although approximately 60 percent of respondents reported a legal (formal) title or ownership certificate, only 16 percent of respondents have a title deed and 13 percent have a certificate of ownership for their residence. Across all parcels (not just the residence), 14 percent of parcels are covered by a formal title; there is no difference between treatment and control respondents (15 percent [91] of control and 13 percent [135] of treatment). Only 17 percent of landlords reported having a form of written agreement, while the larger majority reported a mix of written and verbal agreements with some of the tenants.

ILGU has had a positive effect on certificate of occupancy (COO) knowledge and awareness for the overall sample and youth but not females. Although substantively small, there is also evidence of a positive treatment effect for seeking and acquiring a COO for the aggregate sample, but there is no evidence of a positive effect among youth and women. The results highlight the need for a continued focus on women and other marginalized groups.

Overall, only 11 percent of Mailo respondents report that they know what a COO is compared to approximately 41 percent of landlords. Only 31 percent (40) of those who are aware of a COO have sought to acquire a COO. The COO was provided for in the constitution but not issued for decades (until the first COOs were issued by the ILGU project). Additionally, COOs were not an initial focus of the project (at the project start, the focus was on the LIP). These factors may be some of the reasons why knowledge of

COOs remains low in treatment areas.

Despite the low uptake in COOs, the majority of respondents indicate that they are interested in obtaining a COO-and demand for COOs is higher among treatment respondents (80 percent, 331) versus control (70 percent, 671). The cross-sectional regression results show that, depending on the specification, on average, treatment respondents are 9 to 12 percentage points more likely than their comparison counterparts to "know what a COO is," and this ranges from 10 to 17 percentage points for youth-headed households.

Busuulu payment: There is a limited ILGU effect on busuulu payment indicators. While there is evidence that ILGU beneficiaries were more likely to have ever paid busuulu, there is no evidence that ILGU motivated annual busuulu payments relative to the comparison areas.

In particular, 38 percent of control respondents versus 27 percent of respondents in ILGU communities report that they have **never** paid busuulu. Among direct ILGU beneficiaries, there is an even stronger treatment effect with 38 percent of control respondents versus 16 percent of treatment respondents reporting that they have never paid busuulu. Correspondingly, the cross-sectional impact analysis shows a significant and robust treatment effect for making "any" busuulu payment (treatment effects range from 9.8 to 22.3 percentage points). Female- and youth-headed households are also more likely than their control counterparts to indicate that they have paid a busuulu for their parcel(s). However, among respondents who paid the busuulu, the evaluation finds null effects on the frequency and amount of payment.

Knowledge and awareness: The survey included a series of hypothetical questions on land rights and eviction scenarios. An analysis of descriptive statistics and comparison of baseline and endline trends indicates a high level of awareness and understanding of the legal rights for kibanja holders and landlords. We find that this level of knowledge was already high at baseline in both treatment and control communities and thus there was little room for change to endline.

Correspondingly, there were null treatment effects for knowledge and awareness outcomes in the regression analysis. This raises the important point that lack of knowledge about busuulu payments and kibanja rights is not a primary reason for low and/or uneven payments. Future programming could consider focusing more knowledge and awareness raising about which types of documentation confer which land rights.

Land rights: There is evidence of significant differences and improved perception of land rights among treatment respondents, especially those directly mapped by ILGU. More treatment respondents report that female children have equal rights as male children to inherit the

residence (55 percent of treatment respondents versus 48 percent of control) and have ownership rights to the parcel (86 percent of treatment respondents versus 77 percent of control). Descriptive results for inheritance are not as strong, with differences between treatment and control respondents ranging from 2 to 5 percentage points for questions about giving their parcel to their heir with and without authorization. Similarly, there is little difference between treatment and control for permission to sell or rent out the field. However, all five indicators of land rights included in the cross-sectional impact analysis show positive treatment effects, with the largest effects for perceptions of stronger ownership (9 to 12 percentage points) and ability to sell the parcel (8 to 12 percentage points).

Tenure security: The evaluation finds a high degree of clarity in boundaries for both treatment and control respondents. At endline, 94 percent of respondents report that they, the landlord, and the neighbors have a clear understanding of their boundaries. However, this is only slightly higher for those mapped by ILGU (97 percent) compared to control respondents (93 percent).

At endline, among ILGU beneficiaries and their comparison group, the main concern about ownership rights with a private party relates to 1) deliberate land grabbing (21 percent control, 18 percent treatment) and 2) new landlord/landlord sold the land (16 percent control, 18 percent treatment).

While 43 percent of landlords believed that the ILGU project did not change their concern over their property being encroached upon, 49 percent reported that the project's mapping and boundary demarcation was the biggest contributor to perceived tenure security.

In terms of perceived tenure security, descriptively, there is some evidence that treatment respondents are less concerned with losing rights to their property. Correspondingly, there is weak evidence of positive treatment effects for panel indicators on the risk of losing land rights due to fallowing. These effects are centered on the aggregate sample and youth sample for direct ILGU beneficiaries. Effects are small for the aggregate sample but substantively large (12 percentage points) for youth-headed households, although not robust across specifications. There is no evidence of positive treatment effects for female-headed households.

There is no evidence of treatment impacts for the series of cross-sectional indicators of perceived tenure security. This includes results for worry about loss of use and access rights and the likelihood of disagreements about the ownership rights to the parcel.

Land expropriation: The evaluation finds evidence that ILGU treatment respondents were less likely to have experienced land expropriation in the past five years. Direct program

beneficiaries are 2.3 percentage points less likely to have experienced non-agricultural land expropriation, whereas this is slightly higher at 3.8 percentage points for the full treatment sample. There are sub-group effects among youth-headed households in the sample-direct beneficiaries are 3.6 percentage points less likely to have land expropriated compared to approximately 6 percentage points for the full youth sample. Correspondingly, the "area" of land expropriated is reportedly lower among treatment respondents. These coefficients range from about a quarter of an acre for the overall sample and are smaller at about .15 of an acre for direct program beneficiaries. These are important positive impacts for the program.

Conflict: At endline, conflicts were reported on 10 percent (108) of actively used Mailo tenant fields in the treatment area compared to 11 percent (66) of fields in control areas. In 12 percent (17) of conflicts, respondents lost land as a result of the dispute, compared to 26 percent (22) of conflicts in control areas. Respondents report that they utilized land dispute resolution in the last five years, including during the boundary mapping process or via referral to the ADRM mechanisms and courts, during the course of 35 percent (48) of conflicts in treatment areas and 26 percent (22) of conflicts in control areas.

Overall, the panel regression results indicate that ILGU has reduced conflict in the study area-including reductions in conflict occurrence and reductions in the perceived likelihood of conflict. These results are more clearly evident, robust, and substantive for direct project beneficiaries. Treatment respondents are approximately 5 percentage points less likely to have experienced a conflict on their parcel since 2017, and this is even higher at 5.7 to 5.8 percentage points for the aggregate direct project beneficiaries. While there are no intent-to-treat (ITT) treatment effects for women, there are large and significant effects for women who were direct project beneficiaries; these respondents were almost 11 percentage points less likely to have experienced a parcel conflict than their control counterparts. Similarly, for the perceived likelihood of an ownership dispute, there are positive treatment effects for direct ILGU beneficiaries for the aggregate sample and youth-headed households, although there is no change for women.

For cross-sectional indicators, there are generally similar trends to the panel data analysis for number of conflicts and the likelihood of disputes; there are positive program effects that are centered on the direct ILGU beneficiaries, although the cross-sectional analysis also shows some additional evidence of negative ITT treatment effects for fear of conflict among women.

Investment and productivity: For the panel indicators on various investment indicators, generally, there is evidence of null treatment effects with some instances of mixed negative

and positive treatment effects that are weak and/or not robust to different specifications. We examined the investment indicators for a number of sub-groups to explore whether respondents with more wealth and land, those mapped early in the program, along with those both related to and not related to landlords might be more likely to invest compared to the aggregate sample. Our analysis did not point to heterogeneous treatment effects for the investment outcomes.

Correspondingly, there is no evidence of a treatment effect on productivity indicators, including the total value of crops sold and the expected value of crops sold at the point of data collection. Overall, there is no clear story of investment and productivity effects. This is in line with some descriptive findings. Only 4 percent of respondents report that the mapping process led to an increased willingness to invest in land. Similarly, less than 10 percent of ILGU beneficiaries who received a LIP reported that a primary reason included securing investments.

The absence of investment effects could be due to several reasons. While the evaluation found positive treatment results for conflict and perceived land rights, there was no treatment effect on perceived tenure security, which represents a key outcome that the program sought to improve for the purpose of increasing investment. In addition, the program was not designed to relax financial or input constraints that serve as a major barrier to investment. Also, while there is some evidence that credit-taking is trending in the right direction for LIP recipients, additional time might be needed to see the effects of credit-taking.

Rentals and land markets: There is no clear evidence of treatment effects on the size of landholdings, purchases of Mailo land, willingness to buy Mailo parcels, or parcel rentals. However, there is some weak evidence of non-agricultural land sales over the past five years. Direct program beneficiaries are approximately 3 percentage points more likely to report that they sold non-agricultural land. These results seem to be driven by women in the treatment area who are 3.7 to 4 percentage points more likely than their control counterparts to have sold non-agricultural land, although this finding is weakly significant and does not hold for direct program beneficiaries.

There is little evidence of a treatment effect on perceptions of land values, although there is weakly significant evidence that direct youth program beneficiaries have higher estimated sale values for their primary parcels.

Credit: The evaluation finds a significant amount of loan taking in the study area. At endline, approximately, 39 percent of survey respondents report that they have taken out a loan in the last 12 months. While the evaluation does not find evidence of a positive

treatment effect for credit taking at banks and micro-finance institutions, we find small positive treatment effects for credit taking from Saving and Credit Cooperative Organizations (SACCOS), especially among women.

Livelihoods: The regression analysis of livelihood indicators finds a mostly mixed story. There are null effects for aggregate asset improvements, engagement in wage labor, and annual income from wage labor.

However, in terms of positive effects, there is weak evidence among female direct beneficiaries of increased wealth as measured by an asset index. For household necessities and food security indicators, there are relatively small but consistently positive treatment effects centered on youth-headed households. Youth-headed households in the treatment area are more likely to have shoes and less likely to have experienced food insecurity in the past year.

2 Background

2.1 Context

Mailo is a type of customary land tenure that was created and semi-formalized during the colonial period, creating landlords and tenants. Mailo lands, which are mostly found in central Uganda close to Kampala, are prone to tenure insecurity and high levels of dispute further exacerbated by rising land values (Ali and Duponcel 2018; Deininger and Ali 2008).

The Mailo Land Tenure System is defined by a tenure system where tenants claim use and occupancy rights on land that is registered and owned in perpetuity by landowners who hold a title. This tenure system is based on the land allocation arrangement that occurred as part of the 1900 Buganda Agreement. The 1900 Buganda Agreement divided the 19,600 square miles that formed the Buganda kingdom among the Kabaka (king), regents, chiefs, central government, key offices, and other individuals (Ali and Duponcel 2018).

Official Mailo land cannot be sold entirely but can accommodate kibanja holders as well as leaseholders. Kibanja holders are individuals who settled on the land in Buganda as customary tenants with the consent of the Mailo landowner under the 1928 Busuulu and Envujjo Law.

The dual and overlapping rights to Mailo land are a source of insecurity and conflict. Although Mailo landowners have many of the same rights as freehold landowners, these rights are not equivalent. According to the Land Act, Mailo land rights are equivalent to freehold rights for cases where Mailo land owners have no tenants/kibanja owners occupying their land. Mailo landlords must respect the rights of lawful and bona fide occupants collectively known as kibanja holders to occupy and live on the land. The constitution states that Mailo landowners are not allowed to use their powers against the interests of customary tenants or lawful occupants. This provision was introduced in 1998 and revised further in 2010 to halt evictions by landlords of people occupying Mailo land as customary tenants or squatters (Huber et al. 2018; Musinguzi et al. 2021).

All titles for land under Mailo tenure were issued prior to 1928; thus, new titles for land under Mailo tenure are not being issued. As a result, at present, there is a further subdivision of the existing titles that were issued before 1928, as well as changing the names on the titles in cases where ownership is being transferred. Under the process of subdivision and transfer of ownership, applicants and landowners complete application forms with the zonal office of the Ministry of Lands in their area. After the zonal office completes the remaining steps in the process, the Ministry of Lands issues a land title to the applicant (Troutt 1994).

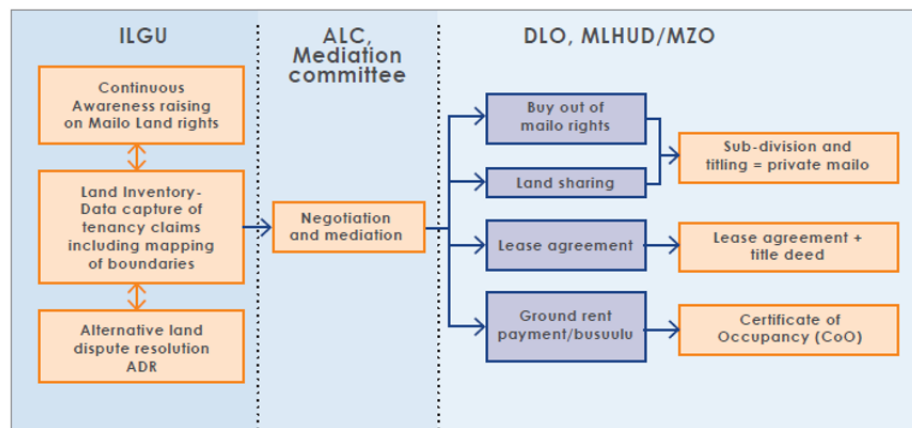
2.2 Improvement of Land Governance in Uganda

The GIZ ILGU (2017-2023) pilot is implementing land governance interventions for Mailo land. ILGU’s goal is to increase the productivity and income of small-scale farmers on Mailo land by piloting interventions to strengthen land tenure security. To date, ILGU has covered 22 sub-counties in 4 districts (Mubende, Mityana, Kassanda, and Gomba). The initiative is co-financed by the European Union and German Government through the German Federal Ministry for Economic Cooperation and Development (BMZ).

ILGU is being implemented in partnership with the Ministry of Lands, Housing and Urban Development (MLHUD) at the national level, District Land Offices at the district level, and Area Land Committees at the sub-county level. The project has further partnered with civil society organizations Uganda Community Based Association for Women and Children Welfare (UCOBAC) and Partners for Community Transformation (PaCT) to undertake dispute resolution and awareness-raising.

The pilot interventions include land inventories (including a low-cost land survey using systematic demarcation), conflict mediation, and facilitating agreements with landlords, as well as continuous awareness-raising and capacity-building for key stakeholders and the rural population on land rights and responsibilities (Figure 2). These interventions are intended to 1) improve the institutional framework and procedures to secure tenure rights in Central Uganda, 2) increase the engagement of civil society in the formalization and implementation of a responsible land policy, and 3) raise awareness of private agriculture investors and financial institutions about responsible land policy along internationally agreed guidelines and the National Land Policy of Uganda.

Figure 2: ILGU Procedure for Securing Land Use Rights of Tenants on Private Mailo Land



ILGU procedure for securing land use rights of tenants on private Mailo land

Boundary mapping occurred from January 2018 to November 2021 (Figure 3). As part

3 Methods and Data

The World Bank is implementing an IE of ILGU. The IE design is based on a geographic discontinuity approach on the sub-county borders. This includes 200 treatment and control EAs¹ that were randomly selected around the sub-county borders. Treatment sub-counties were purposefully selected. The counterfactual group was selected from EAs bordering the sub-counties already selected for implementation to allow for a robust comparison between smallholders participating in the program and “non-treated” smallholders in the neighboring county whose land will not be surveyed by the GIZ project. The key assumption for a geographic discontinuity design is that households living on both sides of the border are similar in observable and unobservable characteristics.

3.1 Research Objectives

The IE is motivated by several learning objectives:

1. Gain a better understanding of the impacts of strengthening tenants’ rights in Mityana and Mubende districts. Evaluation findings will provide key information to promote understanding and help quantify expected impacts and risks associated with the program. As a result, the impact analysis presents results that are disaggregated by gender and status as youth-headed households (those under 35 at baseline).
2. Identify best practices as well as potential issues in the implementation process and provide recommendations to inform the design of a subsequent national roll-out to cover Mailo land. These findings and recommendations might also apply to similar tenure arrangements in Uganda such as native freeholds and churches’ land.
3. Examining the extent of conversion of inventories into COO/Mailo title will help identify the best incentives for registration of COO/Mailo title as well as the benefits associated with registration versus demarcation on key outcome variables (investment, land management, and agricultural productivity).
4. Inform potential new donors’ engagement in support to the implementation of the National Land Policy’s strategic objectives.

1. An EA generally does not have its own name but is commonly known by the name of the Local Council 1 (LC1) that it is associated with.

3.2 Survey Design

Baseline

A listing was undertaken to identify Mailo tenants who were cultivating land in the selected EAs and their landlords (when these are known). The number of occupants interviewed were randomly drawn from the listing data stratified by tenant type (i.e., tenant-owner and pure tenant). The sample size per village was 15; 8 were allocated to tenant-owners and 7 were allocated to pure tenants. In cases where there was more than the sample size in each category, selection was done at random. However, if any group had less than the required sampling number, then all were sampled and the remaining were replaced by the other group.

The baseline survey was conducted in 2017 once the listing data became available to stratify and draw the sample resulting in a total sample frame of 2,800 households. Out of the total frame, baseline data were collected for 2,485 tenant households, cultivating 3,590 parcels in 191 EAs. In addition, 64 resident and non-resident Mailo landlords living in the sampled EAs were interviewed².

Baseline data was collected through computer-assisted personal interviews using Survey Solutions. The Uganda Bureau of Statistics was the local data collection partner. Fieldwork started on August 23, 2017 and ended on February 1, 2018. The response rate was 91 percent.

Endline

Endline data collection took place in 2023. Wilsken Agencies LTD, a Ugandan research firm, conducted the endline data collection. An intensive 18-day-long interviewer training workshop for 60 interviewers was conducted between July 15 and August 10, 2023. Feedback from training allowed the team to improve the instruments and further adapt them to the local context before data collection.³

Following training, a survey pre-test took place over two days beginning August 7, 2023 in four villages in Mityana District to give all team members direct experience using the survey instrument. The data collected from this pre-test also led to several minor improvements in the survey instrument.

2. For additional information on the baseline study, reference: <https://microdata.worldbank.org/index.php/catalog/3857/related-materials>.

3. Interviewers were trained on the study and its objectives, the survey questionnaires, target respondents, survey ethics and conduct, and the practical implementation of the survey, including practice using SurveyCTO. The training contained lectures, role-playing, group exercises, and a written exam. Following the lecture portion of the training, interviewers took turns practicing the survey through mock interviews observed by the rest of the team.

In line with the requirements for human subject protection, the research team received approval from the Mildmay Research Ethics Committee (MUREC) Institutional Review Board on May 16, 2023. Verbal informed consent was received from each participant after reading a statement about the purpose of the research, the content of the survey, any risks or benefits, and the time commitment.

Tenant survey endline data collection took place from August 17 to September 30, 2023. The interviews with landlords commenced on Tuesday, September 19, 2023 and ended on October 26, 2023.

At endline, 1,593 tenant interviews were completed, representing a total attrition rate for the tenant survey of 37 percent from the baseline sample of 2,534 respondents. Attrited baseline respondents were not replaced. The primary causes of attrition were household relocation to another area and refusals. Additional details are provided in the sections below. For the landlord survey, the data collection team was able to track and interview 179 respondents, representing about one-third of the unique landlord names collected in the study area.

Data Quality

The endline data collection effort utilized the following quality control measures: observation of interviewers by team leaders, daily quality control checks by the research team, and auditing/re-interviewing of respondents. Team leaders and quality control supervisors often accompanied interviewers and sat in for part or all of their interviews. For team leaders, this happened at least once every day for one interviewee, and the supervisors accompanied two to three enumerators each time they accompanied a team of enumerators. The selection of the interviewers to observe was informed by the results of the audits and high-frequency checks. Audits occurred on 12 percent of surveys. The audit data was compared to the original data by the research team and the number of discrepancies were recorded. If a large number of discrepancies were found, additional training was offered to the enumerator. If necessary, additional targeted audits were used to investigate unusual patterns that could indicate data falsification.

Finally, the most thorough checks were remote high-frequency checks conducted by the research teams on 100 percent of all tenant surveys using SurveyCTO, the results of which the team compiled and shared with the survey firm. The high-frequency checks compared survey responses by each enumerator to search for patterns indicating data falsification or systematic errors that should be corrected, including short survey times, missing responses, a low average number of "other, specify" responses or multiple selections, and any other significant irregularities by day, geography, team, or interviewer.

3.3 Challenges

The major challenge encountered at endline was the high attrition of tenant respondents from the baseline sample. At endline, the data collection partner sought to interview a total of 1,996 respondents⁴. Out of the baseline sample, the total consent rate was 80 percent (1,593). At 82 percent, consent was slightly higher in treatment areas compared with 76 percent in control areas. The two primary reasons for attrition were refusals and household migration. Other key reasons were that the respondent had died or was very sick.

Another important source of attrition was the inability of the data collection team to conduct interviews in seven villages. In three villages (Namutidde, Kibale, and Busolo), some district authorities in Mityana and Gomba districts denied the survey team permission to conduct interviews. Furthermore, in four villages, interviewers were barred entry due to unresolved land conflict and resulting distrust of outsiders (Busolo B, Kigoba, Nakasagazi, and Lugalama).

There was a significant amount of migration in the study area. In some villages, all baseline respondents had shifted or migrated to another place due to persistent land conflict or expropriation by the Government of Uganda or investors. A household was classified as having relocated if the entire household was no longer at the location of the baseline survey and confirmed that they shifted to a different location outside the survey area of the endline. For all households where the tenants had shifted to locations still accessible within the survey areas, attempts were made to locate and interview these households. Additionally, some people were registered at baseline as tenants but did not actually have land where they were tenants (they were just renting houses within the trading centers), and they subsequently relocated prior to endline.

In addition, a few individual refusals occurred due to the length of the survey tool, landlord interference or threats, and discomfort with an individual versus family survey. To mitigate these challenges, the field team interviewed respondents at a time that was convenient for them when they did not have other obligations and provided respondents with a small compensation for their time taken to answer the survey. During the informed consent process, enumerators also explained the confidentiality protections in place to safeguard their answers, and respondents were free to refuse any question they did not wish to answer or to stop participation entirely. Among those who refused, there was a non-trivial number who refused to respond because they did not have time or saw no benefit in the study. Ten percent reported that they did not have permission from another household member and did not want

4. The remaining 538 baseline respondents could not be located within villages, were deceased or incapacitated, had relocated out of the study area, could not be located at home, or were found to be duplicate observations from baseline.

to risk privacy or confidentiality. This occurred mainly in instances where the person who was interviewed at baseline died, divorced, separated, or was otherwise incapacitated.

Potential Contamination

In 2022, the Government of Uganda decided to undertake land dispute prevention and resolution interventions. As these activities include the ILGU project area and the EAs selected as controls, the latter may have become "contaminated." To understand the effects on the endline analysis, additional research was conducted in 2022 that focused on land dispute resolution interventions and perceptions of land tenure security. This involved interviewing both Mailo tenants and the land owners renting out to these tenants. A field survey of approximately 1,400 Mailo tenants was completed in 2022, in addition to a phone-based survey of 269 landowners.

Overall, based on the results of the 2022 supplemental land survey and analysis of implementation fidelity for the endline IE sample, there is little evidence of contamination of mapping and LIP distribution activities in the treatment areas.

3.4 Data Sources and Outcomes

The endline data collection captures three sources of data: a household questionnaire, an agriculture questionnaire, and a landlord questionnaire. The topics covered in these questionnaires include:

- Education and health.
- Household assets, wage employment, and non-market labor activities.
- Housing conditions, water, and sanitation.
- Sources of income, financial decision-making, savings, credit, borrowing, and banking in the past 12 months.
- Credit and details of loan applications.
- Non-crop farming household enterprises activities.
- Shocks and coping strategies.
- Welfare and food security.
- Decision-making, bargaining, and social capital (male and female).

- Gender perceptions, legal knowledge, and conflicts (male and female).
- Current land holdings (owned and access rights).
- Agricultural and labor inputs and quantification of production.
- Crops grown and typed of seeds used.
- Animal assets, farm implements and machinery, and extension services.
- Land market and related activities.

Within the household survey, there was also a section specific to a female respondent in male-headed households. This section collected information on legal knowledge through scenario-based questions and hypothetical examples on both legal knowledge and women's land rights specific to Mailo land.

4 Sample Characteristics

The total household sample size is 1,594. Using the boundary designations for the geographic discontinuity design, 60 percent of the sample is in treatment areas and 40 percent of the sample is in control areas.

Within the treatment group, 43 percent (414) of respondents in the sample report that they were mapped by ILGU. Ninety-three percent of those with a map are in the designated treatment area. Thus, in the study sample for the evaluation, there are 30 households in the originally designated control areas who received the treatment.

The analysis estimates the results for both the ITT effect (original treatment designation based on geography compared to original control designation based on geography) and the treatment on the treated (ATT-direct participants in the ILGU program versus those who were not mapped).

Overall, most respondents, 69 percent of both treatment and control respondents, received their most important earnings from subsistence farming during the last 12 months. However, treatment respondents are slightly (18 percent versus 13 percent) more likely to be involved in commercial farming. The statistics are generally equivalent for the sample of households that reported they were mapped by ILGU.

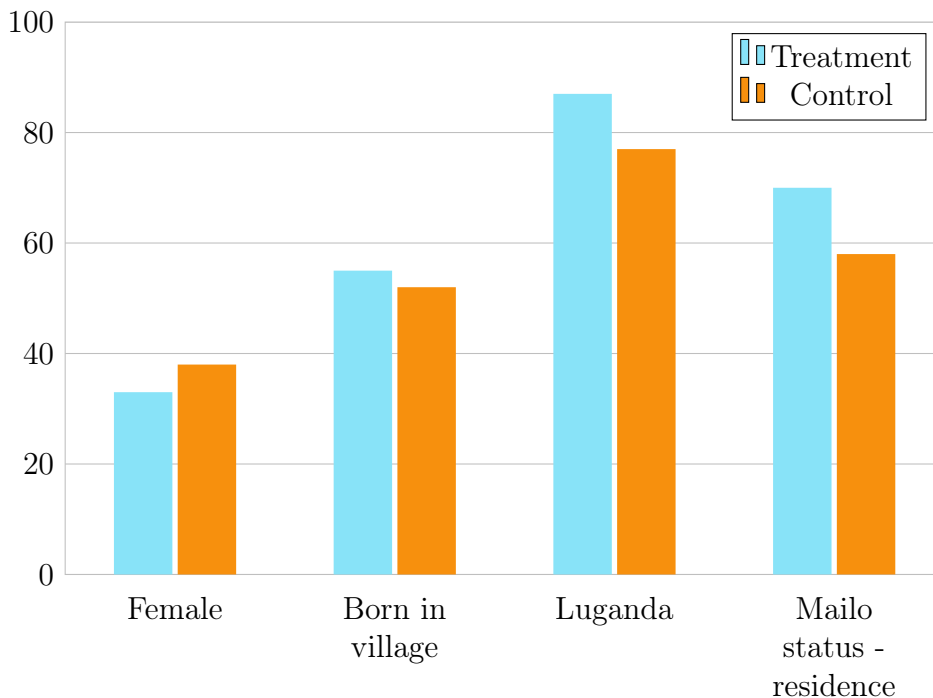
Thirty-five percent (558) of respondents are female heads of household (Figure 4). These are generally equivalent in treatment (33 percent, 317) and control (38 percent, 241) areas. Approximately 54 percent of the sample report that they were born in the village. This is generally equivalent across treatment (55 percent, 424) and control groups (52 percent, 259). Of those who were born in a different area, 95 percent (762) were born in another village in Uganda.

The majority of respondents report that the primary language spoken at home is Luganda. There is a discrepancy between treatment and control; Luganda is the primary language between treatment (87 percent, 825) and control (77 percent, 485) respondents. Among control respondents, there is a greater proportion who report that Runyoro is the primary language spoken at home (15 percent of control versus 3 percent of treatment).

For primary dwelling, 88 percent of respondents noted that their residence was a detached house, and 95 percent of respondents noted that the current tenure status of their dwelling is owner occupied. This is similar across treatment and control respondents. Eighty percent of both treatment and control households report that their endline dwelling is the same dwelling that they had in 2017 during the baseline survey.

Eighteen percent of treatment and 16 percent of control respondents report that the tenure status of the dwelling has changed since 2017. For those who report that the tenure

Figure 4: Sample Characteristics



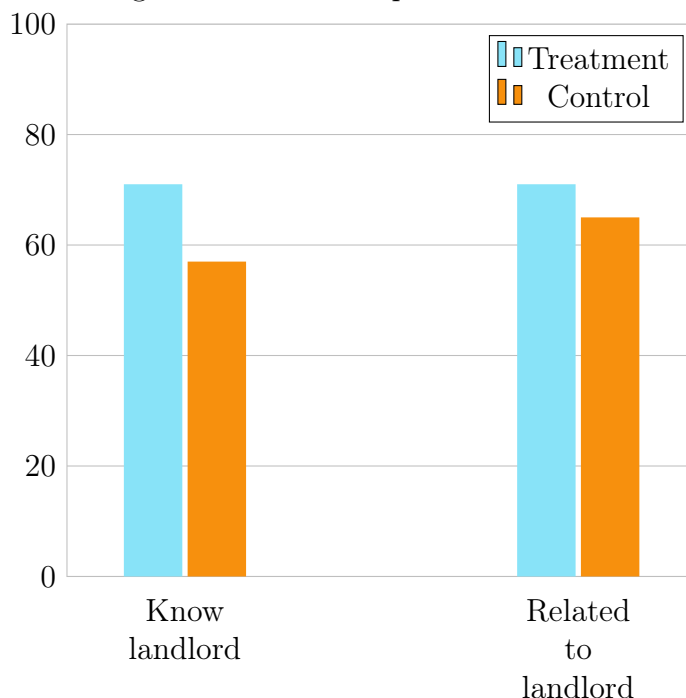
status of the dwelling has changed, 94 percent of those respondents indicated that the current status is owner occupied, and these results are similar for treatment and control respondents.

Overall, 70 percent of respondents report that the household has Mailo tenure rights to the parcel where the residence is located. However, there is a significant difference between treatment and control respondents; 58 percent of control respondents versus 78 percent of treatment respondents report that their residence is on a parcel that is under Mailo tenure. This discrepancy is only slightly reduced when we focus on those who were mapped by ILGU-80 percent treatment versus 66 percent control.

Overall, 76 percent of respondents report that they are the kibanja holders, 11 percent report that they are the landlord of the parcel, and 14 percent report that they are neither the landlord nor the kibanja holder. A larger portion of control respondents are not on kibanja land (neither as landlords nor as kibanja holders), thus as per the tenure indicator above, there are a greater number of respondents that note that they are Mailo tenants among treatment respondents (78 percent versus 72 percent). However, the reported landlords between the two groups are similar: 10 percent in treatment and 11 percent in control.

Significantly more treatment respondents know their landlord-71 percent treatment compared to 57 percent control (Figure 5). Among those who know their landlord, 71 percent of treatment respondents and 65 percent of control respondents report that they are not related to the landlord.

Figure 5: Relationship with landlord



4.1 Explaining Treatment Status

The evaluation finds variation in the extent of mapping and LIP provision within the treatment area. We used baseline data to fit random forest models to two key endline conditions: 1) whether a parcel in the treatment geography was mapped by ILGU and 2) among the households with a mapped parcel, whether the household received a LIP. The random forest models examine 55 baseline indicators (see Annex C) to calculate which baseline features are most predictive of these endline implementation outcomes.

The feature importance model is important for a relative versus absolute assessment of the importance of various factors. The absolute magnitude of importance scores does not have a useful interpretation for the analysis. Overall, the analysis finds that baseline treatment indicators of total household wealth and farming revenue are more predictive of eventual ILGU-mapping status than baseline survey items that track experience with or proximity to land conflict. However, in terms of predictive performance, the models perform only moderately well (see Annex C).

In this random forest model trained to predict who was mapped by ILGU, the five most important variables in determining the predicted outcome include, in order of importance: amount of busuulu paid, asset wealth, expected value of crops sold, value of crops already sold, and total landholdings. Specifically, those who were eventually mapped by ILGU paid

a higher amount of busuulu, had slightly larger landholdings, and reported a slightly higher value of crops already sold at the time of their interview.

Table 1: Summary statistics for important GIZ-mapping predictors

Item	No parcels mapped by GIZ					At least 1 parcel mapped by GIZ				
	N	Mean	St.Dev	Min	Max	N	Mean	St.Dev	Min	Max
Amount bussulu paid	532	4,075	11,226	0	150,000	409	9,994	19,143	0	150,000
Asset wealth, PCA	532	0.289	1.227	-0.211	16.188	409	0.154	0.561	-0.193	4.696
Expected value of crops sold	532	1,422,937	8,624,039	0	126,600,000	409	1,034,742	2,105,696	0	28,109,500
Value of crops sold	532	858,315	4,399,667	0	98,842,600	409	913,718	1,940,868	0	28,109,500
Total landholding acreage	532	3.463	5.209	0	67	409	3.777	4.18	0	52.5

Among those mapped by ILGU, the five most important variables in determining the predicted outcome are all socio-economic indicators. These include, in order of importance: outbuildings, the size of the dwelling parcel, total landholdings, an asset wealth index, and a dwelling quality index. With the exception of the asset wealth index, respondents who eventually received a LIP have more landholdings and better-quality dwellings. Essentially, the evidence indicates that those who were better off were modestly more likely to ultimately receive a LIP.

The study did not find any evidence that tenants with a landlord relation were more likely to be mapped by ILGU or receive a LIP; 12 percent of mapped households and 10 percent of unmapped households had a landlord relation.

Table 2: Summary statistics for important LIP predictors

Item	No LIP obtained					LIP obtained for at least 1 parcel				
	N	Mean	St.Dev	Min	Max	N	Mean	St.Dev	Min	Max
Outbuildings	139	0.683	0.467	0	1	270	0.878	0.328	0	1
Dwelling parcel acreage	139	1.798	2.37	0	15	270	1.901	2.979	0	30
Total landholding acreage	139	3.496	2.97	0	17	270	3.922	4.682	0.1	52.5
Asset wealth, PCA	139	0.212	0.793	-0.193	4.696	270	0.124	0.389	-0.193	2.662
Dwelling quality, PCA	139	-0.126	1.713	-5.021	2.93	270	0.265	1.813	-5.021	3.661

4.2 Balance

Ideally, the original sampling of treatment and control groups is done by random assignment of individuals within a single population. When randomization is not possible, such as in the Uganda Mailo endline study, which uses a quasi-experimental regression discontinuity approach, matching techniques after baseline data collection balance the treatment and control samples on potential confounders before studying a treatment's effects. For the

Uganda Mailo endline study, we assessed balance between treatment and control respondents on several baseline indicators, including perceived tenure security, perceived likelihood of conflict, busuulu payment, and number of socio-economic factors including landholdings, occupation, wealth, occupation, household size, literacy and level of food security. This subsection summarizes balance analysis results and recommendations; please refer to Annex B for the full results and discussion.

Overall, the baseline balance between treatment and control households is good. Statistically, most indicators are balanced. For those variables that are imbalanced, the magnitude of the imbalance is small (i.e., below an absolute standardized mean difference of .25). In terms of the imbalanced indicators, we find that households in the treatment area are more likely to have a bank account, engage in wage labor, have paid busuulu in the past, and have experienced a conflict in the past five years.

To determine if pre-processing techniques improved balance, we tested three methods: propensity score matching using Mahalanobis distance, genetic matching, and entropy balancing. Entropy balancing outperforms both matching methods in minimizing absolute standardized mean difference and has an effective control sample size of approximately 290 observations. Based on this analysis, we analyzed the main specifications described throughout this report with entropy-weighted results as a robustness check.

5 Findings-Program Participation and Documentation

Figure 6: Summary of Documentation Findings

Summary of Documentation Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH
Documentation	Improvement	Improvement	Improvement
REGRESSION INDICATORS			
Presence of documentation	Only ILGU direct beneficiaries	Only ILGU direct beneficiaries	No change
Aware of COO		No change	
Sought a COO	Only ILGU direct beneficiaries	No change	No change
Acquired a COO	Only ILGU direct beneficiaries	No change	No change

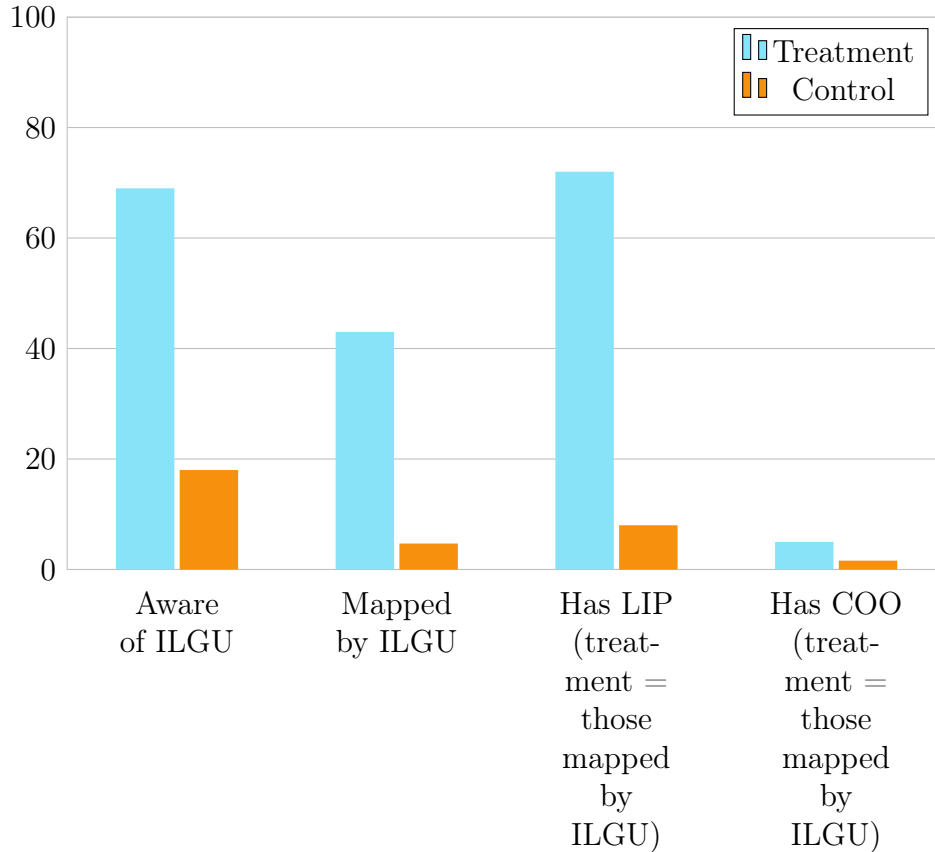
Sixty-nine percent (730) of managers of active tenant parcels in treatment areas reported awareness of the ILGU project that conducted land mapping process, public awareness-raising, and land conflict resolution processes in their area compared to 18 percent (108) of parcel managers in control areas. For parcels that were mapped by ILGU, 89 percent of managers affirmed that they were aware of the ILGU project.

Overall, 46 percent (381) of the sample report that they have a LIP (Figure 7). Among those who participated in ILGU, 72 percent (355) of those mapped by ILGU have a LIP. The remaining 28 percent either do not have a LIP (24 percent) or do not know if they have one (4 percent). Among those respondents who say that they were not mapped by ILGU, 8 percent have a LIP.

Out of ILGU beneficiaries who received a LIP, the primary reasons for acquiring a LIP include: supporting an ownership or inheritance claim (62 percent, 221), supporting a boundary claim (71 percent, 252), protecting the land from being expropriated or reallocated (15 percent, 55), avoiding or mitigating a conflict (13 percent, 46), and supporting the ability to permanently transfer land (13 percent, 46) (Figure 8). Other categories, such as to secure investments, to support the ability to rent land, and to support efforts to receive a COO, received less than 10 percent of responses.

For those who did not receive/collect the LIP for the parcel, the primary reasons cited are that the process is too expensive (14 percent), rights are secure and there is no need (11 percent), they should not have to pay for documentation (9 percent), busuulu was not paid (7 percent), they are unaware of LIP (7 percent), they do not know the process (7 percent),

Figure 7: Program components

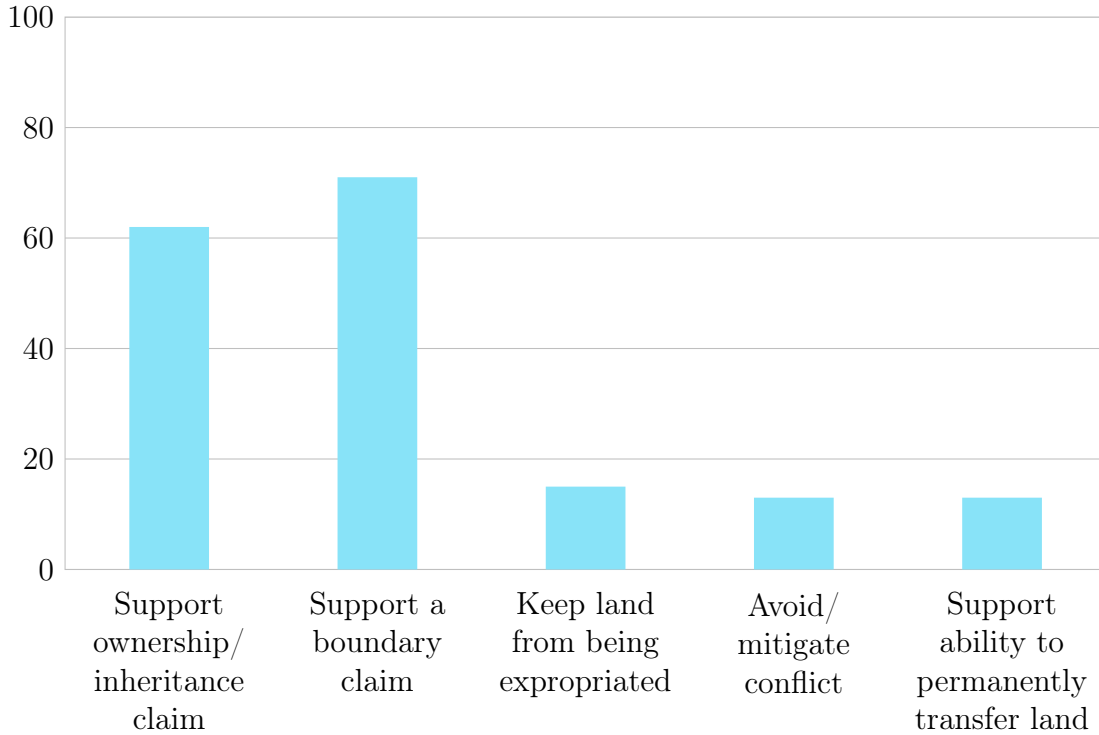


and they tried but the landlord would not agree (6 percent). Other categories with less than 5 percent of responses include ongoing conflicts, lack of boundary map, and lack of necessary documentation.

Despite the widespread distribution of LIPs, according to the results of the dispute survey, the two most common forms of documentation that households had to specify their rights to use the parcels in question were land sales agreements and busuulu payment receipts. This might be because, at present, the LIP is not a legal document; instead, it helps fulfill a step in the process of acquiring the COO. Of those who received a LIP in the dispute survey, a vast majority paid either 10,000 (19 percent) or 20,000 (45 percent) Ugandan shillings. Sixty-eight percent of households surveyed for the dispute survey have other documents, either semi-formal or informal, that would provide proof of ownership to said parcel, while 29 percent do not. Over two-thirds of respondents had an inheritance letter as formal documentation for their parcels.

Benefits from the mapping process include a better understanding of boundaries or use rights (71 percent), improved understanding of parcel size (34 percent), and resolved boundary disputes with neighbors (33 percent). The categories that were not frequently selected

Figure 8: Why acquired LIP



include more security and less concern about conflicts (9 percent), ability to apply for a COO (4 percent), and increased willingness to invest in land (4 percent).

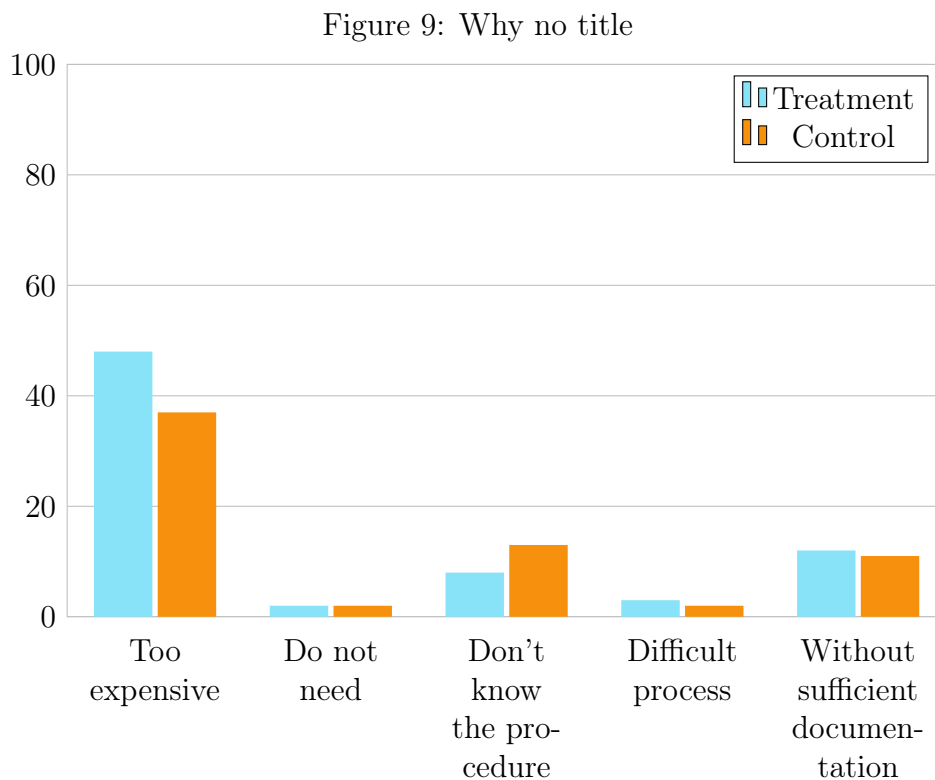
Overall, 58 percent of respondents noted that their household has a "formal" ownership/user rights document for the parcel that their *residence* is on (59 percent control, 57 percent treatment). A different trend emerges when focusing on ILGU participants-54 percent of control versus 67 percent of treatment respondents note that they have formal ownership/user rights for the parcel.

However, when looking at the actual categories of documents secured, many respondents are not aware or knowledgeable of formal versus informal documents. Although approximately 60 percent of respondents reported a legal (formal) title or ownership certificate, only 16 percent of respondents have a title deed and 13 percent have a certificate of ownership for their residence. A higher percentage of control respondents report having a title deed (22 percent control, 12 percent treatment) for their residence. Focusing on ILGU participants, 9 percent of mapped versus 20 percent of non-mapped report having a title deed whereas 17 percent of treatment versus 12 percent of control report that they have an ownership certificate for their residence. Similarly, only 17 percent of landlords reported having a written agreement with tenants, while the larger majority reported a mix of written and

verbal agreements with some of the tenants.⁵

Across all parcels (not just the residence), 14 percent of parcels are covered by a formal title; there is no difference between treatment and control respondents (15 percent [91] of control and 13 percent [135] of treatment). Among those mapped by ILGU, 13 percent (62) have a title and 14 percent (164) do not have a title. Among those with a formal title, 32 parcels were in treatment areas, compared with 30 parcels in control areas, and among the 32 were respondents who reported direct participation in ILGU.

Respondents were asked why they did not have a formal title (Figure 9⁶). The primary reason cited by both treatment and control respondents is that the process is too expensive (36 percent control, 48 percent treatment).



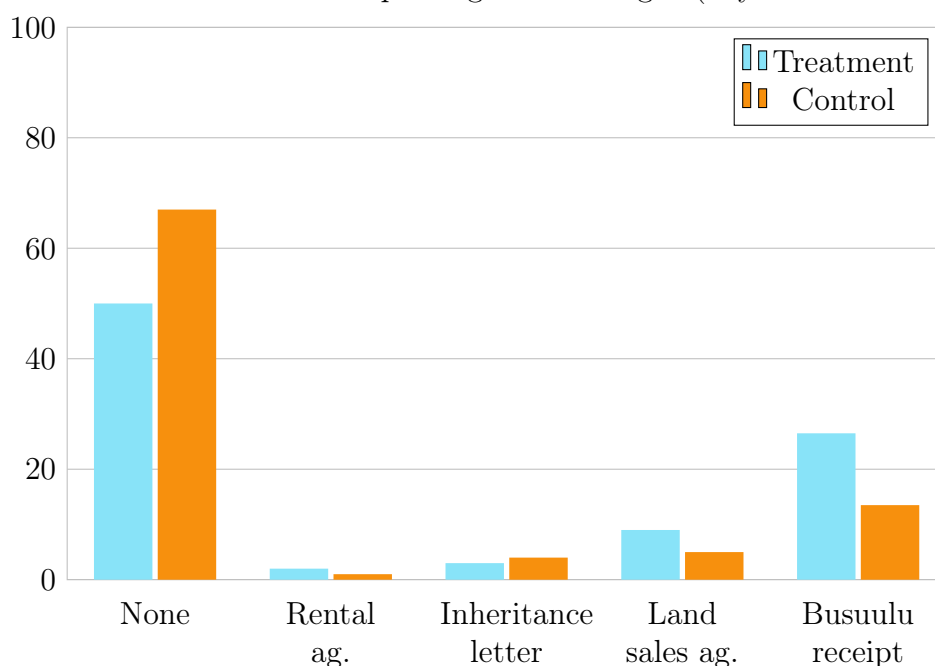
5. These results for landowners differ significantly from those found in the dispute study. According to landlords in the dispute study, 57 percent have a written agreement with all or most of their tenants. On the other extreme, 10 percent of landlords lacked any form of agreement with their tenants. This differential is likely due to the larger sample of landlords in the dispute survey and the fact that the dispute survey only focused on treatment areas.

6. Figure does not sum to 100 because it does not include "Other" reasons (28 percent of treatment responses and 36 percent of control responses).

Other Informal or Semi-Formal Document

The evaluation also investigated informal documentation. Respondents in the treatment area are significantly more likely to report that they have acquired informal or semi-formal documents to prove household land use. As noted in Figure 5 below, 50 percent of treatment respondents compared to 33 percent of control respondents report that they have informal documents to demonstrate land use or ownership rights. In terms of the specific forms of document cited, treatment respondents are more likely to report that they have received busuulu receipts and land sales agreements since 2017.

Figure 10: Informal documents proving land use rights(beyond LIP and COO



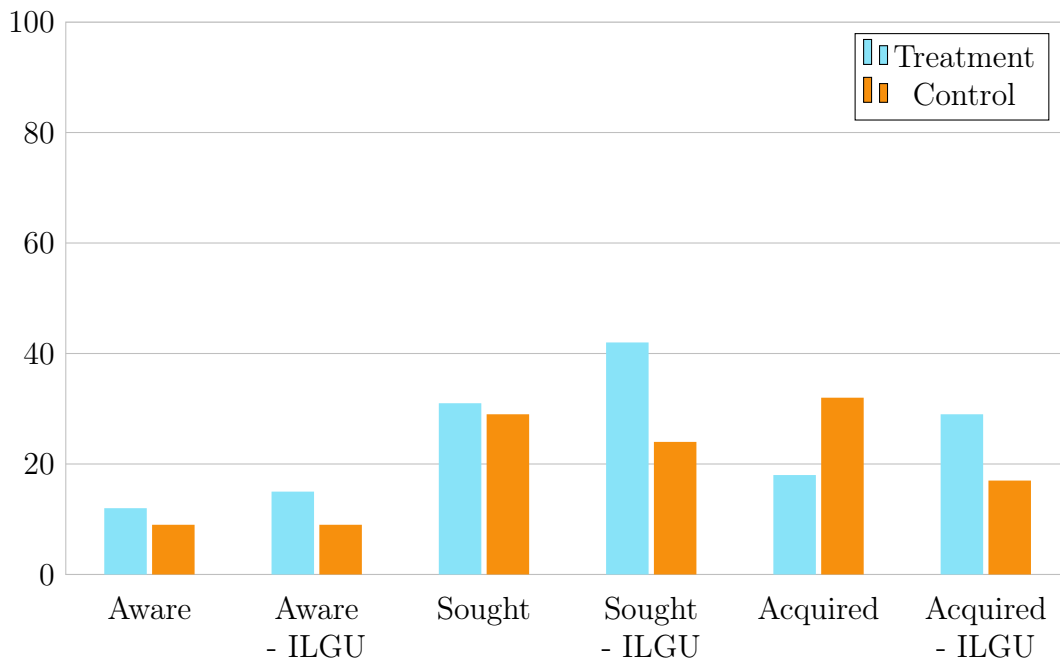
5.1 Certificate of Occupancy

Overall, only 11 percent of respondents report that they know what a COO is. Knowledge is only slightly higher for treatment respondents (12 percent, 126) compared with control respondents (9 percent, 53) and for ILGU participants (15 percent [75] treatment compared with 9 percent [104] control respondents) (Figure 11). The COO was provided for in the Constitution but not issued for decades until the first COOs were issued by the ILGU project. Additionally, COOs were not an initial focus of the project, as the project initially focused on the LIP. These factors may be some of the reasons why knowledge of COOs remains low in treatment areas.

Correspondingly, only 31 percent (40) of those who are aware of a COO have sought to acquire a COO. While there is no difference in the number of respondents who sought a COO between treatment (31 percent, 30) and control areas (29 percent, 10), descriptively, there is a difference between those mapped by ILGU (42 percent, 21) compared with control respondents (24 percent, 19), although it is a small sample size.

Similarly, only 41 percent of landlords were aware of a COO and, of these, 27 percent reported that their tenants sought to acquire a COO for the parcel.

Figure 11: Certificates of Occupancy



Overall, among those aware of the COO, only 22 percent have a COO (40). Out of the 40 respondents with COOs, 23 are in treatment areas and 17 are in control areas. Twenty-two of those mapped by ILGU have a COO compared with 18 individuals who have a COO but were not mapped by ILGU.

Respondents were asked why they acquired a COO. The top three reasons were supporting ownership/inheritance claims (65 percent, 26), supporting boundary claims (65 percent, 26), and increasing the value of the land (28 percent, 11). Other less commonly cited response categories include keeping the land from being expropriated/reallocated (15 percent, 6), supporting land-renting (13 percent(5), and avoiding/mitigating conflict (8 percent, 3).

For respondents who are aware of COOs but do not have one, the top reasons for not acquiring one include they do not know the process (19 percent, 24), rights are secure/there is no need for the document (13 percent, 16), they did not pay the busuulu (11 percent, 14), and they tried but the landlord would not agree (11 percent, 14). The main reasons

the landlords did not approve the request were split (33 percent) between them not being consulted, some tenants not paying busuulu (57 percent) and other landlords being unaware of the procedures. When asked if they would sign the paperwork for the COO's delivery, 33 percent were unsure and only 33 percent said yes, for all tenants.

The main reasons landlords in the treatment area reported agreement with the COO request was that 67 percent believed it would clarify existing land rights on parcels and unused/available land.

Despite the low uptake of COOs, the majority of respondents indicate that they are interested in obtaining a COO, and demand for COOs is higher among treatment respondents (80 percent [331] treatment, 70 percent [671] control).

The two main reasons cited for a lack of interest in COOs are that rights are already secure through existing documentation (21 percent treatment, 21 percent control) and COOs are too expensive (10 percent treatment, 12 percent control). Only 5 percent of control and 7 percent of treatment report that they are not interested in the COO because the landlord would not agree.

Among individuals who are aware of COOs, respondents were asked how much they would be willing to obtain a legal COO to prove their user rights. Treatment respondents report that they would be willing to pay 205,223 Ugandan shillings compared with 568,928 Ugandan shillings for comparison respondents. Although there is a descriptively large difference between treatment and control respondents, this is not a statistically significant difference in the regression analysis.

5.2 Regression Analysis

We analyzed regression results for the presence of documentation across the residence and parcels, including a focus on indicators related to whether respondents are aware of COOs, have sought a COO, or have acquired a COO. We examined aggregate and subgroup results (women and youth) across the ITT specification (those originally designated as treatment) and the average treatment on the treated (those who participated in ILGU).

Given the descriptive analysis above, the results for "formal ownership or use-rights" should be interpreted as the presence of (any) documentation versus the presence of a document issued or approved through the statutory system. There is no treatment effect at the household level. However, the parcel analysis shows overall positive treatment effects for ILGU participants (ATT specifications), as well as for female-headed households among ILGU participants (ATT specifications). Overall, direct ILGU beneficiaries are 13.7 percentage points more likely to report ownership or use-rights documentation for their parcels-and

this is approximately 20 percentage points higher for women (Table 3). This is not surprising and provides an implementation check on one of the first-order outcomes for the program.

Table 3: Has formal ownership or use-rights document for this parcel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.016 (0.042)	-0.016 (0.042)			0.023 (0.055)	0.024 (0.056)			-0.063 (0.080)	-0.064 (0.081)		
DiD-treatment			0.137*** (0.037)	0.137*** (0.037)			0.197*** (0.057)	0.198*** (0.056)			0.070 (0.082)	0.073 (0.082)
Endline	0.516*** (0.033)	0.508*** (0.038)	0.462*** (0.024)	0.454*** (0.029)	0.489*** (0.041)	0.490*** (0.055)	0.450*** (0.032)	0.452*** (0.043)	0.505*** (0.063)	0.510*** (0.079)	0.442*** (0.045)	0.440*** (0.060)
Constant	0.074*** (0.010)	0.051 (0.048)	0.075*** (0.009)	0.052 (0.047)	0.061*** (0.013)	0.052 (0.090)	0.061*** (0.013)	0.050 (0.087)	0.064*** (0.019)	0.065 (0.112)	0.064*** (0.019)	0.066 (0.110)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.465	0.466	0.472	0.473	0.456	0.457	0.470	0.470	0.431	0.431	0.431	0.432
Obs.	2802	2800	2802	2800	971	971	971	971	610	610	610	610
villages	178	178	178	178	167	167	167	167	145	145	145	145

All columns here provide output of panel regressions on 's5q7': "Does your household have a formal ownership/user rights document for this property?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

There is a substantively large and significant treatment effect for the overall sample and youth-headed households for the indicator on awareness and knowledge of COOs. Depending on the specification, on average, treatment respondents are 9 to 12 percentage points more likely than their comparison counterparts to "know what a COO is," and this ranges from 10 to 17 percentage points for youth-headed households (Table 4). The higher ranges of positive treatment effects are centered on the specifications for direct ILGU beneficiaries (TOT/ATT). There is no treatment effect for female-headed households.

Although substantively small, there is also evidence of a positive treatment effect for seeking and acquiring a COO. This effect is robust among direct ILGU participants. Depending on the specification, ILGU beneficiaries are 3 to 4 percentage points more likely than non-beneficiaries to have sought a COO and 2 to 3 percentage points more likely to have acquired a COO (Tables 5 and 6). These results do not translate to youth and female-headed households.

Table 4: Heads of male-headed HHs: Do you know what a COO is?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	0.092*** (0.032)	0.090*** (0.032)			0.100** (0.039)	0.111*** (0.039)		
Treated			0.117*** (0.034)	0.115*** (0.034)			0.174*** (0.051)	0.172*** (0.053)
Constant	0.137*** (0.022)	0.083** (0.040)	0.159*** (0.018)	0.114*** (0.038)	0.108*** (0.027)	-0.004 (0.063)	0.120*** (0.022)	0.058 (0.060)
Covariates		X		X		X		X
HH-head subset	All	All	All	All	Young	Young	Young	Young
R ²	0.013	0.035	0.018	0.040	0.016	0.037	0.045	0.061
Obs.	863	862	863	862	285	285	285	285
villages	173	173	173	173	126	126	126	126

All columns here provide output of endline cross-sectional regressions on 'know_coo_male': "[Asked only to heads of male-headed HHs] Do you know what a certificate of occupancy is?" Columns 1-4 include all surveyed HHs and columns 5-8 include only HHs with heads under age 35. Regressions include the following covariates where indicated with 'X': HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, and 6 identify the intent-to-treat effect; columns 3, 4, 7, and 8 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Has sought certificate of occupancy for this parcel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	0.012 (0.008)	0.029*** (0.011)			0.008 (0.008)	0.021** (0.010)			0.014 (0.015)	0.036 (0.023)		
Treated			0.026** (0.012)	0.037** (0.015)			0.017 (0.013)	0.025 (0.017)			0.037 (0.027)	0.052 (0.032)
Constant	0.017*** (0.005)	-0.017 (0.025)	0.016*** (0.004)	-0.010 (0.025)	0.005 (0.004)	-0.005 (0.020)	0.005 (0.003)	0.003 (0.018)	0.007 (0.007)	-0.061 (0.051)	0.004 (0.004)	-0.052 (0.045)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.001	0.026	0.006	0.030	0.002	0.015	0.006	0.019	0.003	0.057	0.019	0.073
Obs.	1647	1082	1647	1082	547	349	547	349	383	233	383	233
villages	175	163	175	163	151	123	151	123	132	102	132	102

All columns here provide output of endline cross-sectional regressions on 'coo_sought': "Has your household sought to acquire a certificate of occupancy for this parcel?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Has certificate of occupancy for this parcel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	-0.006 (0.011)	-0.008 (0.011)			-0.003 (0.015)	-0.011 (0.018)			0.018 (0.013)	0.003 (0.013)		
Treated			0.029** (0.011)	0.020* (0.011)			0.017 (0.016)	0.004 (0.016)			0.033 (0.021)	0.010 (0.018)
Constant	0.028*** (0.010)	0.029** (0.013)	0.016*** (0.004)	0.017 (0.010)	0.018 (0.014)	0.029* (0.017)	0.012 (0.008)	0.021 (0.015)	0.007 (0.007)	0.050* (0.030)	0.008 (0.005)	0.048 (0.030)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.000	0.009	0.008	0.012	0.000	0.012	0.003	0.010	0.004	0.018	0.013	0.019
Obs.	1647	1082	1647	1082	547	349	547	349	383	233	383	233
villages	175	163	175	163	151	123	151	123	132	102	132	102

All columns here provide output of endline cross-sectional regressions on 'coo': "Do you have certificate of occupancy for this parcel?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6 Findings—Busuulu Payment

Figure 12: Summary of Bussulu Findings

Summary of Busuulu Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH	TENANTS RELATED TO THE LANDLORD	LARGE LANDHOLDERS (TOP DECILE)
Bussulu Payment	Partial improvement	Partial improvement	Partial improvement	No change	Partial improvement
REGRESSION INDICATORS					
Made any busuulu payment	Only ILGU direct beneficiaries	Only ILGU direct beneficiaries	Only ILGU direct beneficiaries (weak)	No change	
Amount of busuulu paid	No change	No change	No change	Some positive - but weak, not robust	No change
Made annual busuulu payments	No change	No change	No change	No change	No change

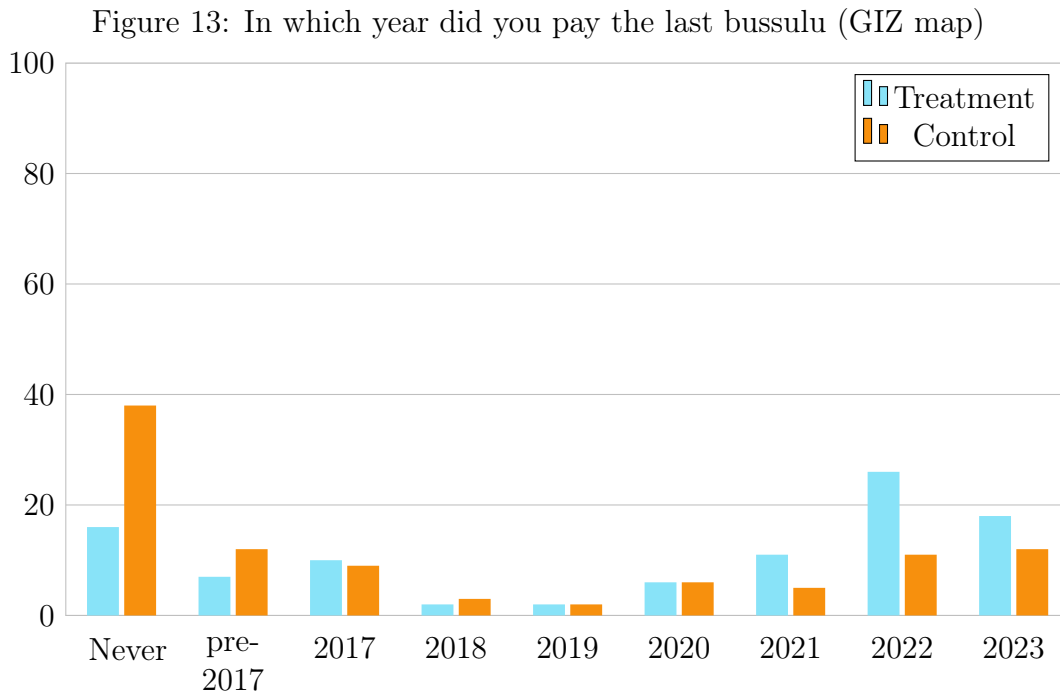
Busuulu payments are set by district land boards and therefore can vary between and within districts based on status as rural, municipality, town council, and town board. Although these rates can vary and are higher in more urban areas, overall, the busuulu payment represents a nominal annual ground rate. These can range from 2,500 to 5,000 Ugandan shillings per parcel in rural areas and 10,000 to 30,000 Ugandan shillings per parcel in town boards and town councils.

Busuulu payments can be a contentious issue. There are reports and news stories of landlords demanding higher busuulu rates or pressuring their kibanja holders to buy the land on which they are settled, given the low official rates of busuulu. There are also reported instances where landlords do not accept busuulu, in cases where they do not want to create rights for Mailo tenants farming land without permission of the landlord. Cases of absentee landlords or landlords refusing busuulu payments have prompted the Buganda Land Board (BLB) to allow kibanja holders to deposit nominal ground rates (busuulu) at the sub-counties.

Our study finds limited evidence of treatment effects for busuulu payments. Thirty-eight percent of control respondents versus 27 percent percent of ITT treatment respondents report that they have **never** paid busuulu. Among direct ILGU beneficiaries, there is an

even stronger treatment effect with 38 percent of control respondents versus 16 percent of treatment respondents reporting that they have never paid busuulu.

In line with the rates assigned by the land boards, the average busuulu rates reported in our study area range from 25,612 shillings in control areas compared to 26,834 shillings for ILGU communities. For direct ILGU beneficiaries, this average is 27,692 shillings. These average amounts for busuulu payments are not significantly different between treatment and comparison areas.



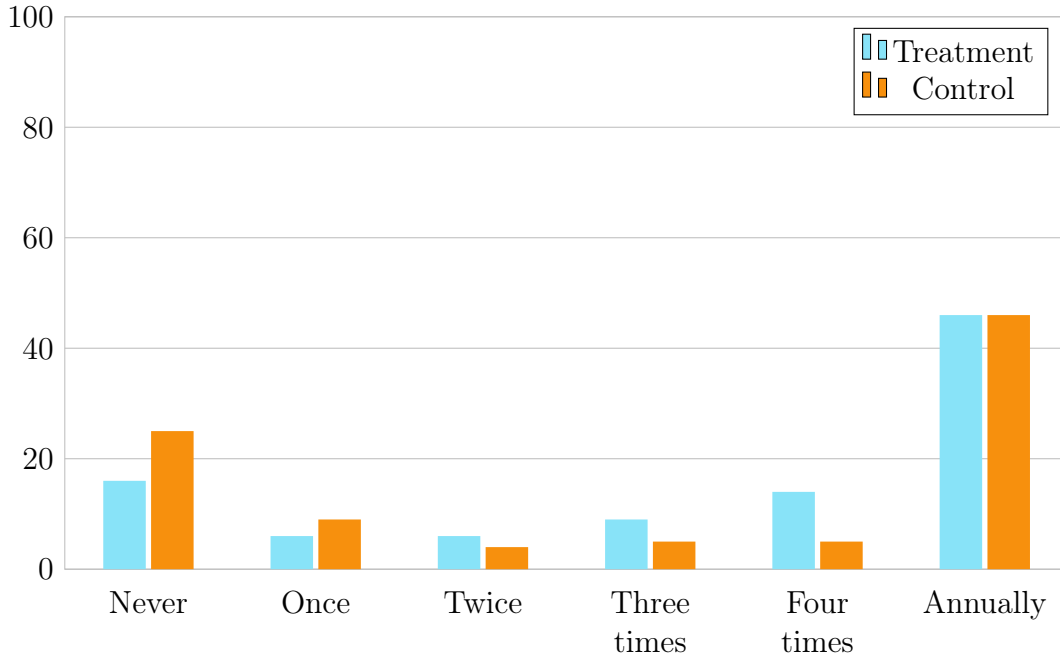
When asked about how often busuulu payments were made in the past five years, more treatment respondents reported payment in 2017, 2022, and 2023 (Figure 13). In terms of the frequency, descriptively, there are more responses in frequency among treatment respondents for payments that were made twice, three times, and four times (Figure 14). However, there is no difference in reports of annual payments by treatment and control respondents.

The landlord results indicate a distinct polarity regarding the frequency of busuulu payments; 45 percent reported that they have "never" collected a busuulu payment, whereas 42 percent reported that they collected busuulu payments annually in the last five years.

Among ILGU direct beneficiaries, respondents were asked if there were any changes in their busuulu payment following mapping and conflict resolution. Twenty-three percent (116) say that the payment increased, 57 percent (282) report that it remained the same, and 10 percent (49) report that it decreased (Figure ??).

At 56 percent, the landlord results track with Mailo tenants for reports that there were

Figure 14: Bussulu payment in the last 5 years (GIZ map)



no changes in the frequency of payments following the mapping or conflict resolution process. However, a smaller percentage of landlords (14 percent) stated that there was an increase, whereas a higher percentage (30 percent) noted a decrease in frequency.

Eighty-five percent of ILGU beneficiaries report that a receipt was issued compared with 67 percent of control respondents (Figure 16). When asked why a receipt was not issued, respondents noted that they never asked for a receipt (24 percent treatment, 27 percent control) and the landlord refused to provide the receipt (5 percent treatment, 5 percent control).

Figure 15: Bussulu payment after ILGU

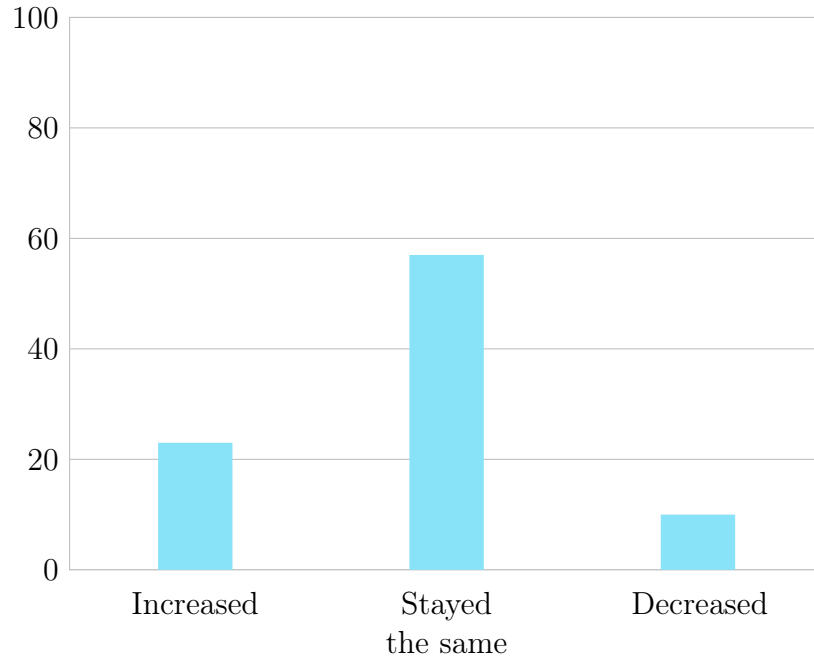
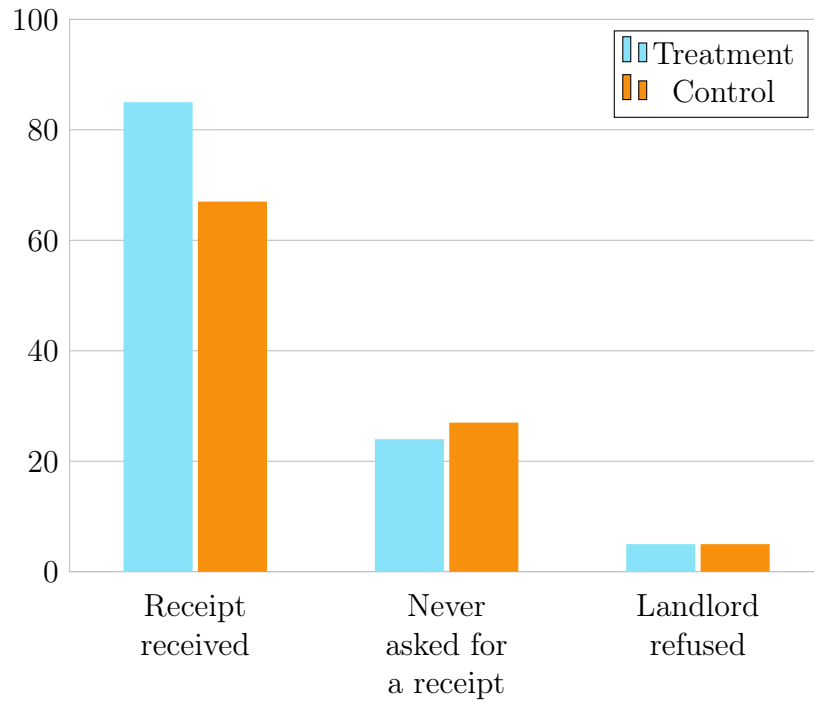
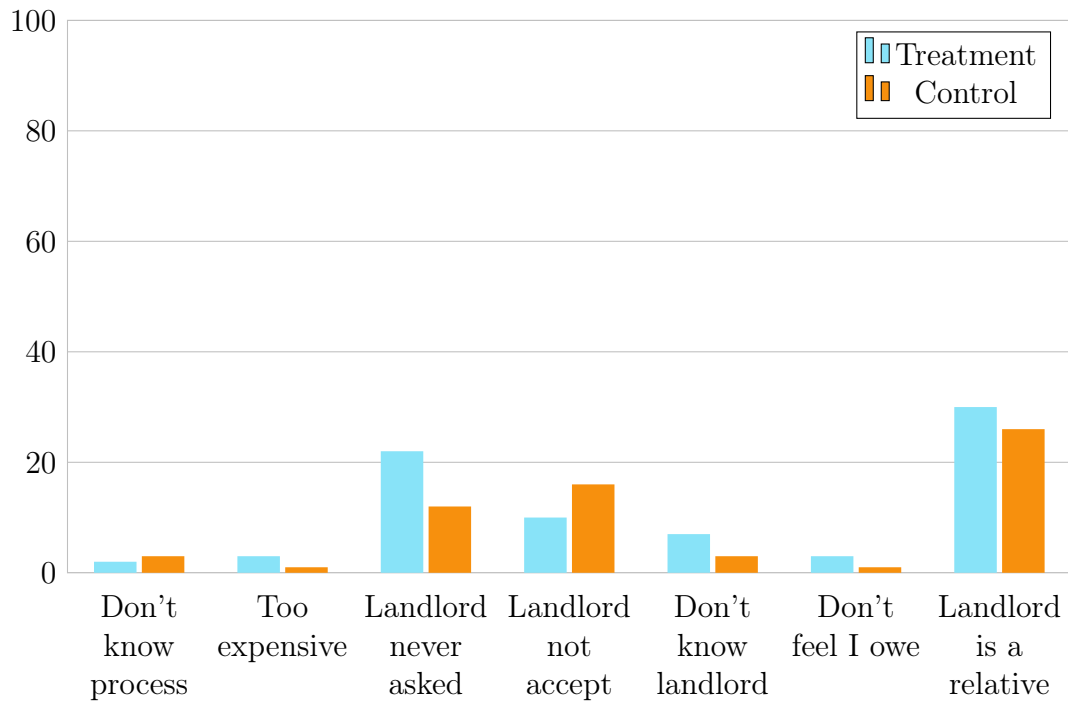


Figure 16: Receipts



For respondents who reported that the busuulu was never paid (Figure 17), the primary reason cited across both treatment and control respondents is that the landlord is a relative (26 percent control, 30 percent treatment). Similarly, the other two most prevalent responses are that the landlord never asked (12 percent control, 22 percent treatment) and that the landlord will not accept the payment (16 percent control, 10 percent treatment). Other less common responses include that they do not know the process (3 percent control, 2 percent treatment) and that they do not know the landlord (3 percent control, 7 percent treatment). The least reported reasons are that the busuulu payment is too expensive (1 percent control, 3 percent treatment) and that they do not feel like they owe anything to the landlord (1 percent control, 3 percent treatment).

Figure 17: Why bussulu was never paid



6.1 Regression Analysis

In line with the descriptive findings, the impact analysis shows a significant and robust treatment effect for making "any" busuulu payment (Table 7). This finding is present among direct ILGU beneficiaries. Across the full ATT sample, ILGU beneficiaries are 16.7 percentage points more likely to have ever paid the busuulu than their control counterparts. There are also subgroup effects within the direct ILGU beneficiaries for women and weak/not robust results for youth. Female-headed households are 13 to 14 percentage points more likely than their control counterparts to indicate that they have paid a busuulu for their parcel(s). Although weakly significant and not robust to different specifications of the model, youth-headed households are approximately 19 percentage points more likely to have paid busuulu than their comparison counterparts.

Among respondents who paid the busuulu, we examined indicators about the frequency and amount of busuulu payments. There were null treatment effects across all specifications and subgroups for these outcomes.

Table 7: Ever paid bussulu: Y/N

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.085*	0.074			0.038	-0.003			0.051	0.094		
	(0.047)	(0.047)			(0.076)	(0.078)			(0.103)	(0.107)		
DiD-treatment			0.167***	0.167***			0.143**	0.134*			0.133	0.188*
			(0.049)	(0.049)			(0.069)	(0.071)			(0.103)	(0.098)
Endline	0.279***	0.331***	0.278***	0.320***	0.275***	0.384***	0.249***	0.326***	0.349***	0.343***	0.346***	0.364***
	(0.038)	(0.043)	(0.026)	(0.033)	(0.061)	(0.076)	(0.044)	(0.053)	(0.086)	(0.113)	(0.065)	(0.091)
Constant	0.311***	0.453***	0.311***	0.459***	0.328***	0.593***	0.327***	0.609***	0.235***	0.400***	0.221***	0.459***
	(0.008)	(0.063)	(0.017)	(0.064)	(0.012)	(0.120)	(0.022)	(0.117)	(0.015)	(0.135)	(0.037)	(0.134)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.212	0.218	0.240	0.246	0.179	0.197	0.194	0.216	0.262	0.280	0.310	0.332
Obs.	3099	3098	2655	2655	1028	1028	884	884	644	644	532	532
villages	178	178	175	175	157	157	151	151	136	136	128	128

All columns here provide output of panel regressions on "s2bq12": "Have you ever paid busuulu to the landlord?" This question was only asked about parcels for which respondents had reported knowing the landlord. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The evaluation also examined these busuulu payment regression outcomes for tenants who were related to the landlord and for large landholders (defined as the top decile of landholders). For large landholders, the results were tracked with aggregate findings. Large holders in the treatment area were more likely to have paid the busuulu at some point in the last five years; however, there was no effect on the frequency or the amount of the payment. For tenants who are related to the landlord, there is very weak evidence of an increase in the amount of busuulu paid, but this is contrasted with no treatment effects for having paid

busuulu in the past five years or the frequency of the payments.

7 Findings-Knowledge and Awareness

Figure 18: Summary of Knowledge and Awareness Findings

Summary of Knowledge Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH
Knowledge	No change	No change	No change
REGRESSION INDICATORS			
(Male head) Can a landlord evict a tenant paying annual busuulu? Correct answer is NO.	No change	No change	No change
(Female head) Can a landlord evict a tenant paying annual busuulu? Correct answer is NO.	No change	No change	No change
(Female head) Can a landlord sell the land with no compensation to tenants if tenants no longer cultivate/pay busuulu? Correct answer is YES.	No change	No change	Weakly correct
(Male head) Can a landlord sell the land with no compensation to tenants if tenants no longer cultivate/pay busuulu? Correct answer is YES.	No change	No change	No change
(Male head) Can a tenant sell kibanja without informing landlord? Correct answer is NO.	No change	No change	No change
(Female head) Can a tenant sell kibanja without informing landlord? Correct answer is NO.	No change	No change	No change
(Male head) Can landlord evict tenant who paid busuulu every year without compensation? Correct answer is NO.	No change	No change	Weakly incorrect
(Female head) Can landlord evict tenant who paid busuulu every year without compensation? Correct answer is NO.	No change	No change	No change

The evaluation baseline and endline surveys included four hypothetical scenarios to test respondents' knowledge of busuulu and kibanja rights.

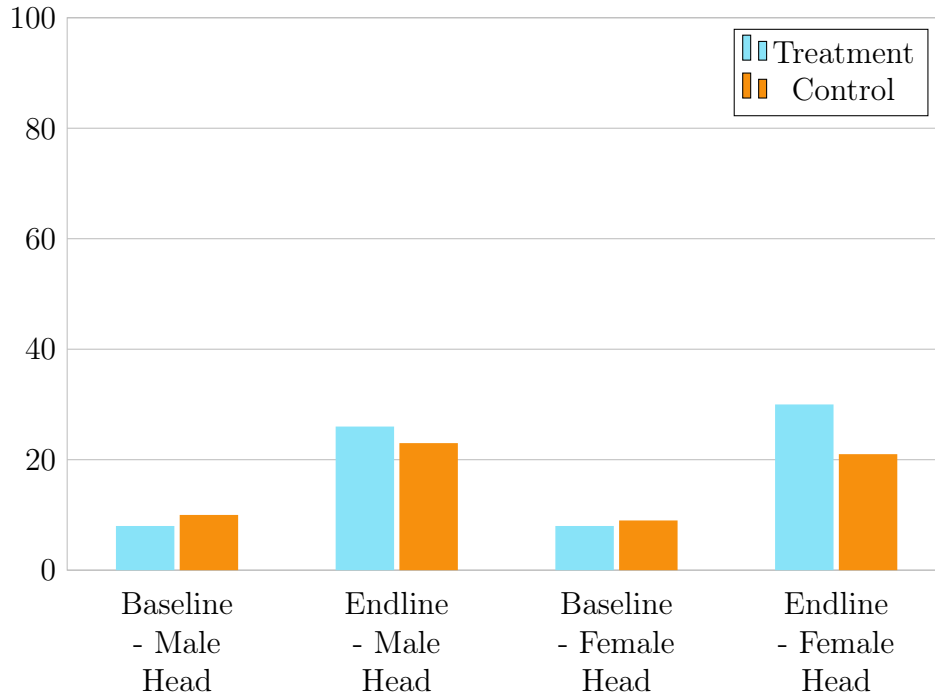
1. Can a landlord evict a tenant paying annual busuulu? Correct answer is NO.
2. Can a landlord sell the land with no compensation to tenants if tenants no longer cultivate/pay busuulu? Correct answer is YES.
3. Can a tenant sell kibanja without informing landlord? Correct answer is NO.

4. Can a landlord evict a tenant who paid busuulu every year without compensation?
 Correct answer is NO.

For scenarios one, three, and four, knowledge was high at baseline (at least 90 percent of respondents in both the treatment and control groups answered correctly at baseline), and the number of correct responses did not change at endline.

However, for scenario two, there are increases in knowledge of the correct answer in both the treatment and control groups from baseline to endline, but increases are larger for the treatment group. Specifically, at baseline, about 10 percent of respondents answered this correctly (8 percent male head treatment, 10 percent male head control, 8 percent female head treatment, 9 percent female head control). By endline, about a quarter of respondents were answering this question correctly (26 percent male head treatment, 23 percent male head control, 30 percent female head treatment, 21 percent female head control), and this change was most dramatic with female treatment household heads, where the proportion of respondents who answered correctly rose by 22 percentage points.

Figure 19: Knowledge of Landlord Rights if Tenant Does Not Pay Bussulu (Scenario 2)



7.1 Regression Analysis

This analysis focused on the knowledge and awareness of hypothetical land rights and eviction scenarios across different household types, with a particular emphasis on male-headed and

female-headed household respondents.

Overall, there were generally null treatment effects for knowledge and awareness outcomes in the regression analysis for male and female-headed households. There is some evidence of negative effects for youth in the treatment area, but these results are weakly significant and not robust to different specifications. Specifically, youth in the treatment area are 9â10 percentage points less likely to answer a question about male tenants' rights correctly (Table ??). Similarly, there is also weakly significant negative ITT treatment effects for youth in the treatment area regarding a question about female tenants' rights, although not robust to different specifications.

Awareness-raising by the BLB and other programs might represent a reason for the lack of difference in knowledge and awareness indicators between treatment and control areas. For example, the BLB completed at least one massive busuulu assessment and collection exercise in 2020.⁷ Teams from the BLB were expected to move across the Buganda kingdom to assess "every" tenant and collect busuulu. This campaign included knowledge-raising about the benefits of paying busuulu: 1) it creates a harmonious relationship between a landlord and tenant, 2) it confirms the security of tenure for a kibanja holder, and 3) busuulu payment is a legal obligation, the breach of which can lead to the loss of one's kibanja interests; thus it is an obligation for every kibanja holder.

ILGU completed a separate knowledge and awareness assessment. According to that assessment, there were significant improvements in knowledge- and awareness-raising. Thus, the results of this IE are not in line with the previous assessment. To understand the differences, the evaluation team examined the methodology and survey instrument that was used in the ILGU assessment and found key differences between the indicators and sample for the assessment versus the IE. The first key difference is that the ILGU assessment focuses on 60 total female respondents from project areas and there is no comparison group. The second key difference is that the assessment and evaluation are examining very different knowledge and awareness outcomes. The evaluation questions (as designed at baseline and then asked again at endline) are phrased as a knowledge test of kibanja holder land rights, including women's land rights. These are phrased as hypothetical questions, and respondents are required to select the "correct" response. In contrast, the ILGU assessment asks whether respondents are "familiar" with a number of topics related to land rights. Thus, in the assessment, respondents are not required to select the correct answer but are instead asked to rank their level of familiarity.

7. See <https://mulengeranews.com/wp-content/uploads/2020/01/stip-ccc.pdf>.

8 Findings-Land Rights

Figure 20: Summary of Land Rights Findings

Summary of Land Rights Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH	TENANTS RELATED TO THE LANDLORD
Land Rights	Improvement	Improvement	Improvement	Improvement
REGRESSION INDICATORS				
Ownership rights			Only ILGU direct beneficiaries	
Right to bequeath		Only ILGU direct beneficiaries		Only ILGU direct beneficiaries
Right to rent	Only ILGU direct beneficiaries	No change	No change	Only ILGU direct beneficiaries
Right to sell	Only ILGU direct beneficiaries	Only ILGU direct beneficiaries	Only ILGU direct beneficiaries	Only ILGU direct beneficiaries
Right to use for collateral	Only ILGU direct beneficiaries	No change	No change	No change

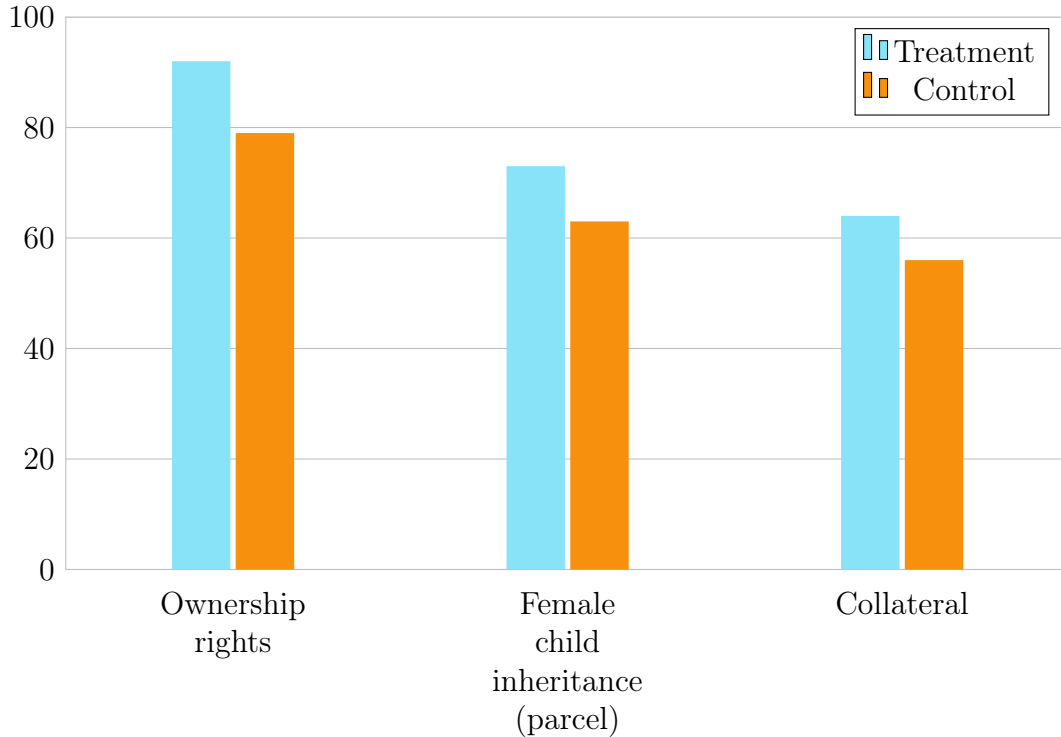
There is evidence of significant differences and improved perceptions of land rights among treatment respondents, especially those directly mapped by ILGU (Figure 21).

There is descriptive evidence of better treatment outcomes for inheritance rights for female children for the residence. Forty-eight percent of control respondents versus 55 percent of treatment respondents report that female children have equal rights as male children to inherit the residence. Residence results for this indicator track with responses across all parcels across the ITT designation (64 percent, 385 control versus 68 percent, 711 treatment) and more substantive results for ILGU participants (63 percent control versus 73 percent treatment).

When asked about ownership rights to the parcel, 92 percent of ILGU participants versus 79 percent of non-participants responded that someone in their household has ownership rights to the parcel. This compares with 86 percent (905) of treatment respondents and 77 percent (462) of control respondents.

Results for inheritance are not as strong (Figure 22). Sixty-four percent of treatment respondents versus 60 percent of control respondents report that they can give the parcel to their heirs without authorization. Only 2 percent more in treatment than control report that

Figure 21: Land rights I - ILGU participants

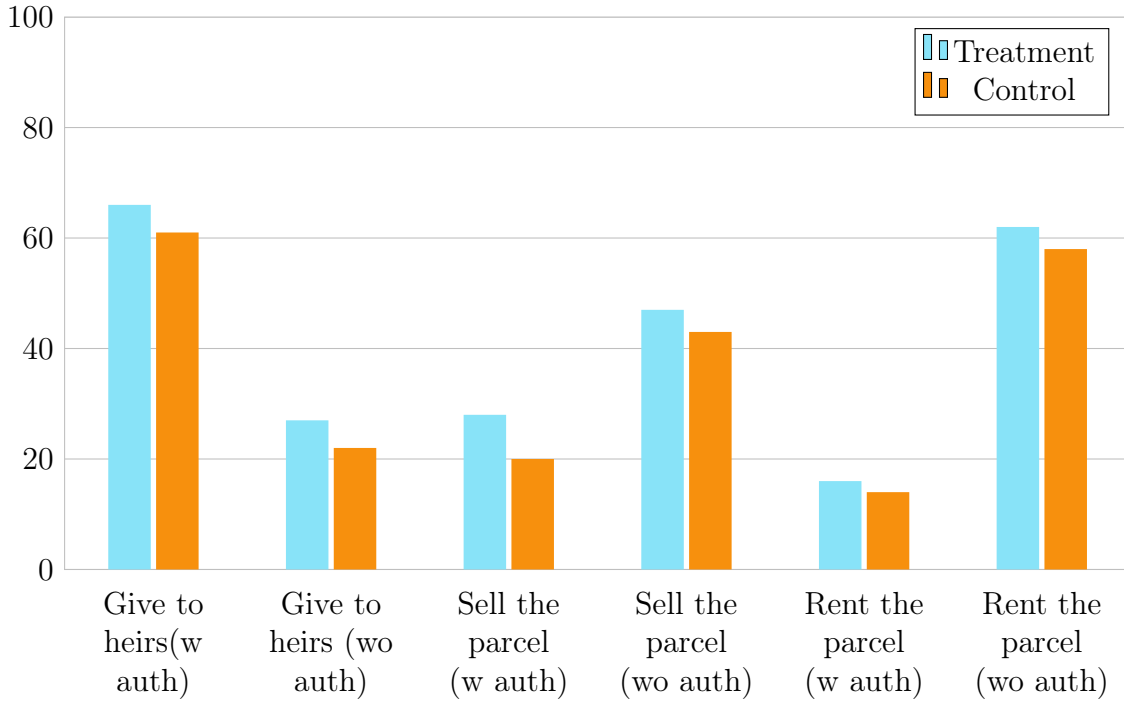


they can do it with authorization. For those who have a map, 66 percent of treatment versus 61 percent of control respondents said they can do this without authorization, whereas 27 percent of direct ILGU beneficiaries versus 22 percent of non-beneficiaries reported that they can with authorization.

For permission to sell the parcel to someone else, there is no difference between treatment and control with ITT (treatment 45 percent without authorization, 44 percent control) or for TOT (21 percent control and 23 percent treatment with authorization). For direct ILGU beneficiaries, 47 percent of treatment compared with 43 percent of control respondents say they can sell the parcel to someone else without authorization, and 28 percent of treatment versus 20 percent of control report that they can with authorization.

There is little difference in questions about permission to rent out the field. For ITT without authorization, 60 percent of treatment respondents can do so versus 58 percent control, and with authorization is 16 percent control and 13 percent treatment. Among direct ILGU beneficiaries, 62 percent of treatment respondents and 58 percent control report that they can sell the parcel without authorization, while 14 percent control versus 16 percent treatment can do so with authorization.

Figure 22: Land rights II - ILGU participants



8.1 Regression Analysis

We analyzed five indicators of land rights (ownership, right to bequeath, right to rent, right to sell, right to use as collateral) for the impact assessment and found positive treatment impacts across all five indicators. The results are presented below in Tables 8 - 12. Not surprisingly, the largest aggregate effects are centered on the direct ILGU beneficiaries-and while there is solid evidence for perceptions of stronger ownership (9 to 12 percentage points) and inheritance (6 to 9 percentage points) rights among treatment respondents, there are weaker effects for renting (5 to 6 percentage points) and using the parcel for collateral (8.5 percentage points). Interestingly, there are also relatively strong treatment effects for ability to sell (8 to 12 percentage points) the parcel.

These positive findings generally extend to the subgroups of interest, although mostly centered on direct ILGU beneficiaries. Tenants related to landlords and female- and youth-headed households are significantly more likely than their control counterparts to report land rights associated with ownership (female: 11 to 12 percentage points; youth: 11 to 17 percentage points), inheritance (female: 9 percentage points; youth: 11.5 to 14 percentage points), and the right to sell (female: 13.5 percentage points; youth: 11.5 to 18 percentage points).

Table 8: Ownership rights to this parcel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	0.091*** (0.024)	0.099*** (0.027)			0.095** (0.044)	0.106** (0.048)			0.061 (0.043)	0.009 (0.056)		
Treated			0.123*** (0.021)	0.114*** (0.024)			0.113*** (0.038)	0.124*** (0.040)			0.172*** (0.041)	0.112** (0.053)
Constant	0.775*** (0.021)	0.786*** (0.046)	0.796*** (0.015)	0.814*** (0.042)	0.759*** (0.037)	0.823*** (0.058)	0.787*** (0.027)	0.867*** (0.049)	0.746*** (0.032)	0.756*** (0.138)	0.729*** (0.026)	0.717*** (0.116)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.014	0.020	0.023	0.026	0.014	0.034	0.016	0.040	0.005	0.044	0.038	0.064
Obs.	1633	1078	1633	1078	542	347	542	347	377	232	377	232
villages	174	161	174	161	150	122	150	122	132	102	132	102

All columns here provide output of endline cross-sectional regressions on "g43": "Does anyone in your household have ownership rights to the parcel?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Permission to bequeath parcel to heirs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	0.059*** (0.022)	0.023 (0.022)			0.049 (0.032)	0.019 (0.037)			0.132** (0.054)	0.024 (0.055)		
Treated			0.088*** (0.017)	0.062*** (0.020)			0.096*** (0.033)	0.092*** (0.034)			0.143*** (0.037)	0.114*** (0.043)
Constant	0.843*** (0.019)	0.839*** (0.037)	0.854*** (0.013)	0.832*** (0.033)	0.819*** (0.026)	0.782*** (0.064)	0.823*** (0.020)	0.773*** (0.053)	0.754*** (0.050)	0.827*** (0.119)	0.791*** (0.032)	0.801*** (0.100)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.008	0.018	0.016	0.027	0.004	0.030	0.014	0.045	0.030	0.051	0.033	0.074
Obs.	1611	1067	1611	1067	524	337	524	337	374	228	374	228
villages	173	161	173	161	150	120	150	120	131	100	131	100

All columns here provide output of endline cross-sectional regressions on "field_heir": "Do you have permission to give this parcel to your heirs?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Permission to rent parcel to others

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	-0.016 (0.029)	-0.015 (0.031)			-0.048 (0.048)	-0.061 (0.060)			0.036 (0.054)	-0.049 (0.062)		
Treated			0.061** (0.027)	0.054* (0.030)			0.022 (0.052)	0.034 (0.060)			0.079* (0.046)	0.067 (0.060)
Constant	0.760*** (0.021)	0.801*** (0.049)	0.731*** (0.017)	0.770*** (0.049)	0.739*** (0.035)	0.757*** (0.082)	0.705*** (0.027)	0.705*** (0.073)	0.766*** (0.043)	0.737*** (0.136)	0.764*** (0.033)	0.668*** (0.125)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.000	0.010	0.004	0.014	0.003	0.014	0.000	0.012	0.002	0.042	0.008	0.046
Obs.	1624	1071	1624	1071	535	343	535	343	375	230	375	230
villages	175	163	175	163	151	123	151	123	132	102	132	102

All columns here provide output of endline cross-sectional regressions on "field_rent_perm": "Do you have permission to rent this this parcel to someone else?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35, flag if HH member has held notable office. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Permission to sell this parcel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	0.044 (0.033)	0.000 (0.034)			0.055 (0.049)	0.006 (0.062)			0.201*** (0.065)	0.071 (0.080)		
Treated			0.120*** (0.029)	0.076** (0.032)			0.135** (0.055)	0.135** (0.060)			0.183*** (0.049)	0.113* (0.066)
Constant	0.654*** (0.024)	0.793*** (0.054)	0.646*** (0.018)	0.765*** (0.050)	0.566*** (0.036)	0.674*** (0.097)	0.563*** (0.027)	0.644*** (0.085)	0.559*** (0.055)	0.660*** (0.153)	0.627*** (0.040)	0.670*** (0.132)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.002	0.037	0.014	0.043	0.003	0.032	0.015	0.048	0.043	0.078	0.034	0.087
Obs.	1617	1067	1617	1067	532	342	532	342	373	228	373	228
villages	175	163	175	163	151	123	151	123	132	102	132	102

All columns here provide output of endline cross-sectional regressions on 'field_sell': "Do you have permission to sell this parcel to someone else?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Rights to use parcel as collateral

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	-0.039 (0.036)	-0.069* (0.035)			-0.056 (0.051)	-0.062 (0.063)			0.080 (0.068)	-0.002 (0.086)		
Treated			0.085** (0.033)	0.056 (0.034)			0.045 (0.054)	0.091 (0.059)			0.098 (0.061)	0.026 (0.071)
Constant	0.625*** (0.029)	0.667*** (0.055)	0.575*** (0.020)	0.599*** (0.052)	0.537*** (0.038)	0.419*** (0.089)	0.492*** (0.028)	0.352*** (0.081)	0.544*** (0.055)	0.588*** (0.172)	0.563*** (0.039)	0.574*** (0.161)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.001	0.042	0.006	0.041	0.003	0.024	0.002	0.027	0.006	0.043	0.009	0.043
Obs.	1604	1060	1604	1060	524	338	524	338	373	229	373	229
villages	174	162	174	162	150	121	150	121	131	102	131	102

All columns here provide output of endline cross-sectional regressions on 'g52': "Does your household have the right to use this parcel as collateral?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

9 Findings-Tenure Security

Figure 23: Summary of Tenure Security Findings

Summary of Tenure Security Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH	TENANTS RELATED TO THE LANDLORD
Tenure Security	Very weak improvement	No change	Improvement	No change
REGRESSION INDICATORS				
Household likelihood of losing rights	No change	No change	No change	No change
Household worry about losing rights	No change	No change	No change	No change
Likelihood of loss if landlord sold land	No change	No change	No change	No change
Likelihood of loss if land was left fallow	Weak improvement only ILGU-beneficiaries	No change	ILGU-beneficiaries	No change

Respondents were asked a series of questions about clarity of boundaries for their residence and their perceived tenure security over their residence and parcel. Overall, there was a high degree of clarity in boundaries for both treatment and control respondents.

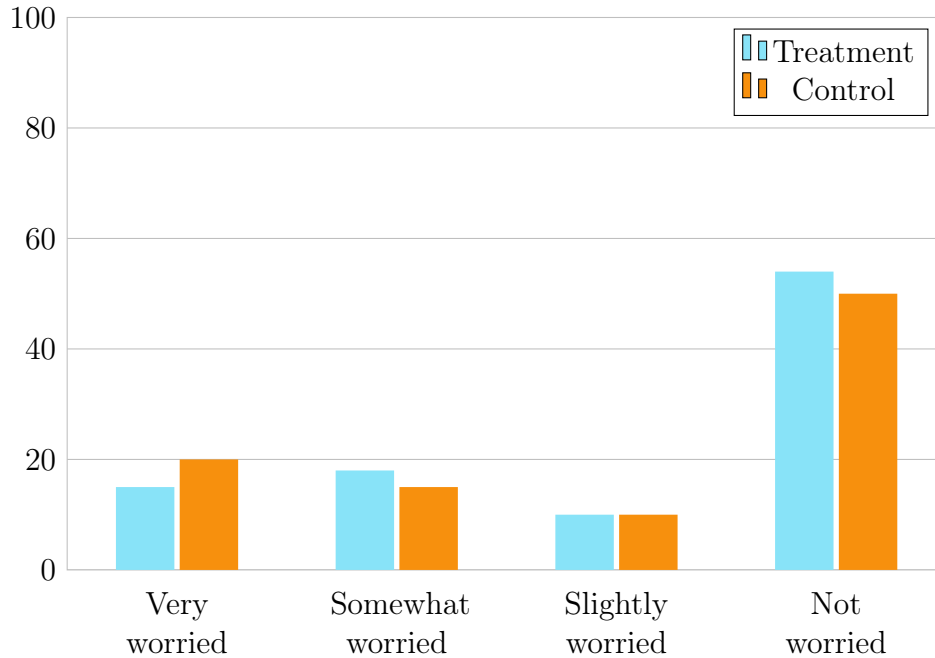
In particular, at endline, 94 percent of respondents report that they, the landlord, and the neighbors have a clear understanding of their boundaries. This is slightly higher for those mapped by ILGU (97 percent), compared to control respondents (93 percent). Among those who had their residence mapped, 51 percent (252) report a better understanding of boundaries, whereas 47 percent(233) report the same level of understanding. Similarly, 52 percent (257) report better understanding of the existing use rights and 46 percent (227) report the same level of understanding.

This is akin to positive landlord responses where approximately 81 percent of landlords report that both they and their tenants have a clear understanding of their land use boundaries. Slightly over half of landlords (51 percent) report higher levels of understanding after the mapping process while 46 percent report the same level of understanding.

As part of the series on perceived tenure security, respondents were asked how worried they are that their household could lose the right to use the property against their will in

the next five years. The results between the originally designated study area and direct ILGU participants are almost equivalent. Figure 24 below highlights the results for the direct ILGU participants. Descriptively, there is some evidence that treatment respondents are less concerned with losing rights to their property.

Figure 24: Worry that household could lose the right to use the property (next 5 years)

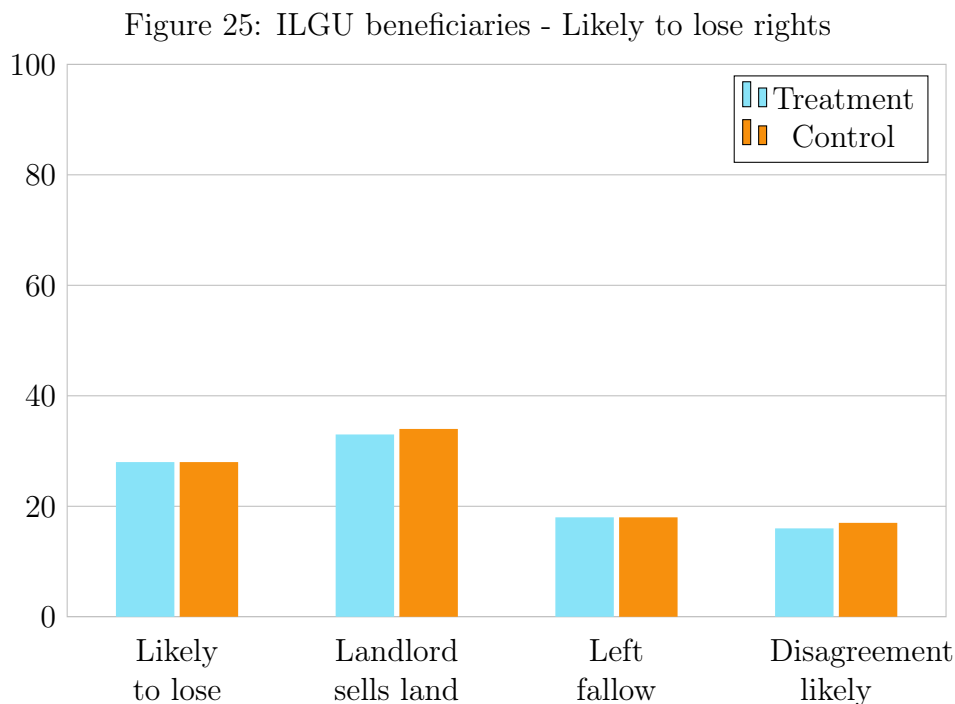


Respondents were also asked a series of questions about the likelihood of losing use and access rights to the parcel. Approximately 50 percent of both treatment and control respondents report that the likelihood of losing rights was very unlikely, whereas 6 percent of treatment and 9 percent of control report that it is very likely. Similar to the question about "worry" for loss of rights, the results between the full study area and direct ILGU participants are almost equivalent-although they show a slightly higher level of tenure insecurity, especially in relation to their control counterparts. In particular, among ILGU beneficiaries, 47 percent report that it is very unlikely that they could lose the use of their land if the landlord sold his land, compared with 46 percent of control respondents. In contrast, 13 percent of treatment and 10 percent of control respondents report that this is very likely.

For a question about losing land that is left fallow for several months, there is no difference in perceived tenure security between ILGU beneficiaries and comparison respondents. 60 percent for both treatment and control respondents report "not at all" and 18 percent of both treatment and control report that it is likely or very likely. Only 6 percent of both control and treatment respondents report that this would be "certain."

For a question about the likelihood of disagreements about the ownership rights to the

parcel with a private property, there is no difference between treatment and control respondents for the direct ILGU beneficiaries, whereas the overall treatment and control designated sample provides some evidence of greater concern among *treatment* respondents. Figure 25 shows the results for the likelihood series across direct ILGU beneficiaries and the comparison group.



Among ILGU beneficiaries and their comparison group, the main concern about ownership rights with a private party relate to 1) deliberate land grabbing (21 percent control, 18 percent treatment) and 2) new landlord/landlord sold the land (16 percent control, 18 percent treatment). While these top two reasons are generally equivalent between treatment and control respondents, busuulu issues represent a larger concern among treatment respondents (7 percent control, 16 percent treatment). Some of the other differences across the original treatment and control geography generally disappear for the sample focused on direct beneficiaries. Across the ITT sample, the main concern about ownership rights with a private party relate to 1) deliberate land grabbing (22 percent control, 19 percent treatment) and 2) new landlord/landlord sold the land (16 percent control, 16 percent treatment). While these top two reasons are generally equivalent between treatment and control respondents, other reasons differ based on treatment status. For example, boundary conflicts are relatively more concerning in control areas (15 percent control, 6 percent treatment) compared to busuulu issues, which are a slightly larger concern in the treatment area (5 percent control, 11 percent treatment), as well as the fact that the "true landlord is not known" (14 percent treatment,

8 percent control).

9.1 Regression Analysis

The regression analysis examined treatment impacts across five indicators of perceived tenure insecurity. Several indicators from this section were added at endline. There are null effects for indicators about perceived likelihood of losing parcel rights (generally over the next five years) and perceived likelihood of losing rights to the parcel if the landlord sold the parcel. For the indicator that asks respondents if they are worried about losing parcel rights, there is evidence in the ITT specification that female-headed households are 9.6 percentage points more likely than female-headed households in the control area to be concerned about losing parcel rights. However, these indicators lose significance in the sample focused on ILGU beneficiaries.

For the two indicators on the likelihood of losing rights when fallowing land, which are panel indicators, there are null aggregate effects and effects for female-headed households for ITT and ATT (50 percent or more). Among youth-headed households, however, there is a 12.9 percentage point reduction (weakly significant) in perceived risk of losing rights due to fallowing (Table 12).

Constructing the indicator as a likelihood indicator between 0 and 1 continues to show the positive treatment effect for youth-headed households (youth are 11.9 percentage points less likely to perceive a risk of losing parcel rights due to fallowing). In this specification, there is a weakly significant aggregate treatment effect for direct beneficiaries; ILGU beneficiaries are 4.5 percentage points less likely to perceive a risk of losing parcel rights due to fallowing. For the panel indicators, there is no evidence of positive treatment effects for female-headed households (Table 13).

Overall, there is weak evidence of positive treatment effects for panel indicators on the risk of losing land rights due to fallowing. These effects are centered on the aggregate sample and youth sample for direct ILGU beneficiaries and do not extend to the full ILGU treatment communities. Effects are small for the aggregate sample but substantively large (12 percentage points) for youth-headed households, although not robust across specifications. There is no evidence of positive treatment effects for female-headed households.

There is no evidence of treatment impacts for the series of cross-sectional indicators of perceived tenure security.

Finally, we also examined the panel and cross-sectional tenure security outcomes for tenants with a landlord relation. These results do not show compelling evidence of treatment impacts.

Table 13: Perceived risk of losing parcel rights due to fallowing: 50% or more

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.054 (0.036)	0.052 (0.035)			0.065 (0.059)	0.055 (0.057)			0.002 (0.073)	0.030 (0.074)		
DiD-treatment			-0.044 (0.033)	-0.044 (0.033)			-0.065 (0.078)	-0.063 (0.079)			-0.129* (0.075)	-0.095 (0.076)
Endline	0.072*** (0.026)	0.087*** (0.028)	0.123*** (0.021)	0.142*** (0.025)	0.056 (0.040)	0.089* (0.046)	0.115*** (0.033)	0.148*** (0.044)	0.102* (0.055)	0.066 (0.063)	0.159*** (0.042)	0.139*** (0.053)
Constant	0.162*** (0.007)	0.229*** (0.050)	0.145*** (0.014)	0.227*** (0.054)	0.174*** (0.012)	0.240** (0.100)	0.160*** (0.021)	0.238** (0.101)	0.173*** (0.013)	0.226** (0.105)	0.126*** (0.030)	0.207* (0.116)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.029	0.031	0.033	0.036	0.023	0.025	0.028	0.031	0.026	0.040	0.046	0.060
Obs.	4015	4014	3328	3328	1318	1318	1091	1091	890	890	700	700
villages	178	178	175	175	167	167	159	159	146	146	137	137

All columns here provide output of panel regressions on 'risk_fallow': "How likely is it that you would lose this land if left fallow for several months?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Perceived risk of losing parcel rights due to fallowing: likelihood between 0 and 1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.030 (0.027)	0.030 (0.027)			0.044 (0.045)	0.037 (0.043)			-0.012 (0.058)	0.012 (0.061)		
DiD-treatment			-0.045* (0.026)	-0.045* (0.026)			-0.072 (0.060)	-0.070 (0.060)			-0.119** (0.060)	-0.096 (0.064)
Endline	0.068*** (0.021)	0.071*** (0.021)	0.105*** (0.016)	0.112*** (0.017)	0.058* (0.033)	0.081** (0.036)	0.105*** (0.026)	0.130*** (0.032)	0.090** (0.044)	0.041 (0.054)	0.135*** (0.031)	0.103*** (0.039)
Constant	0.143*** (0.005)	0.161*** (0.040)	0.129*** (0.010)	0.161*** (0.042)	0.149*** (0.009)	0.208*** (0.076)	0.141*** (0.016)	0.211*** (0.079)	0.155*** (0.010)	0.138* (0.081)	0.109*** (0.021)	0.113 (0.089)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.033	0.034	0.041	0.042	0.031	0.032	0.041	0.044	0.027	0.041	0.055	0.066
Obs.	4015	4014	3328	3328	1318	1318	1091	1091	890	890	700	700
villages	178	178	175	175	167	167	159	159	146	146	137	137

All columns here provide output of panel regressions on 'risk_fallow': "How likely is it that you would lose this land if left fallow for several months?" Choices were presented alongside percent values; this dependent variable was constructed using proportion between 0 and 1 corresponding to the choices. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

10 Findings-Land Expropriation

Figure 26: Summary of Land Expropriation Findings

Summary of Expropriation Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH
Expropriation	Improvement	No change	Improvement
REGRESSION INDICATORS			
Experienced non-agricultural land expropriation, past five years		No change	
Area of non-agricultural land expropriated		No change	

The evaluation assessed perceived risk of land expropriation and actual occurrence of land expropriation. The descriptive results show higher reports of wrongful evictions in the last 10 years in the control group. Among females, this is 13 percent for control compared to 3 percent for treatment. For male-heads, this is 11 percent for control versus 8 percent of treatment.

When asked about the likelihood of landlords evicting people without proper compensation in the next five years, approximately 56 percent of male and female respondents in the treatment and control groups report that such evictions will not happen at all.

Most treatment and control respondents report that complaints for forced evictions after land sales should be lodged with the LC1.

Figure 27: Perceived Likelihood of Uncompensated Evictions Over the Next 5 Years

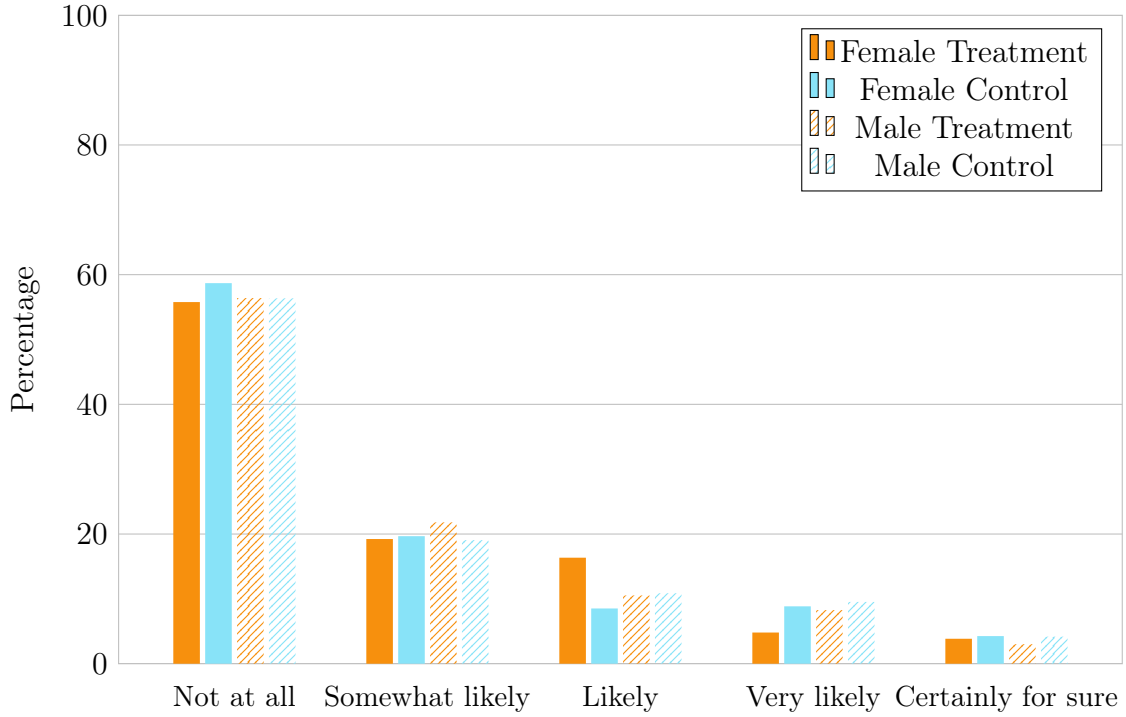
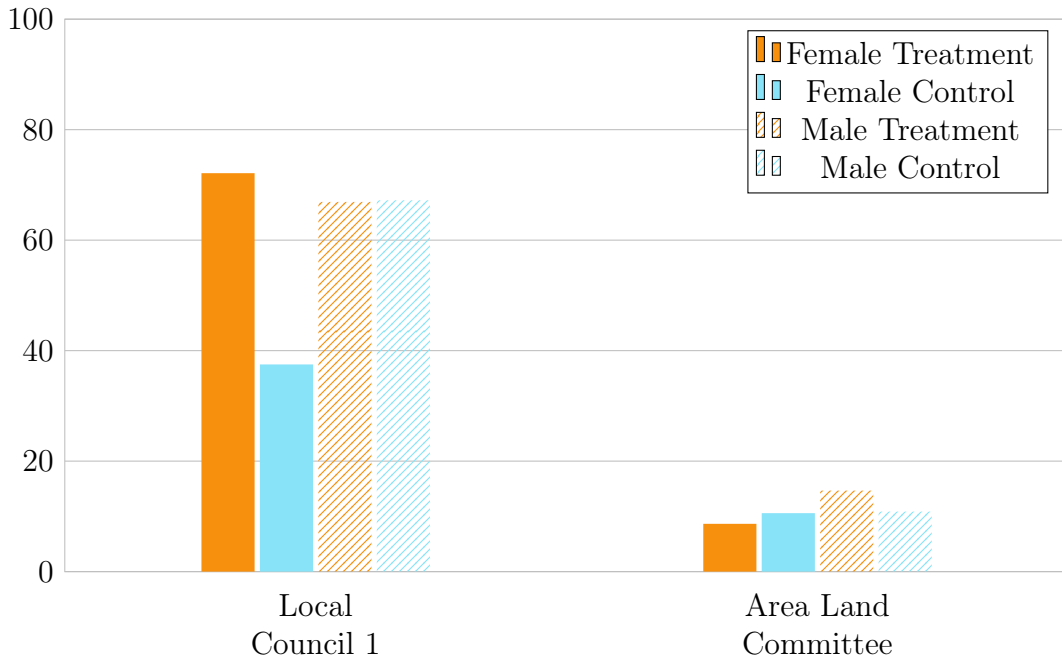


Figure 28: Channels for Lodging Complaints in Case of Forced Eviction After Land Sale



10.1 Regression Analysis

Importantly, there is evidence that ILGU treatment respondents were less likely to have experienced the expropriation of non-agricultural land in the past five years. Direct program beneficiaries are 2.3 percentage points less likely to have experienced non-agricultural land expropriation, whereas this is slightly higher at 3.8 percentage points for the full treatment sample. There are sub-group effects among youth-headed households in the sample-direct beneficiaries are 3.6 percentage points less likely to have land expropriated compared to approximately 6 percentage points for the full youth sample (Table 15). Correspondingly, the "area" of land expropriated is reportedly lower among treatment respondents. These coefficients range from about a quarter of an acre for the overall sample and are smaller at about .15 of an acre for direct program beneficiaries (Table 16).

Table 15: Had non-agricultural land expropriated, past 5 years: Y/N

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.038*** (0.013)	-0.038*** (0.014)			-0.015 (0.017)	-0.018 (0.017)			-0.057** (0.029)	-0.060** (0.029)		
DiD-treatment			-0.023** (0.011)	-0.023** (0.011)			-0.015 (0.018)	-0.015 (0.018)			-0.036*** (0.013)	-0.036** (0.015)
Endline	0.050*** (0.012)	0.055*** (0.013)	0.034*** (0.008)	0.037*** (0.009)	0.035*** (0.013)	0.049*** (0.016)	0.030*** (0.010)	0.041*** (0.013)	0.070** (0.028)	0.095*** (0.035)	0.046*** (0.014)	0.065*** (0.022)
Constant	0.005 (0.003)	0.016 (0.012)	0.005 (0.003)	0.012 (0.012)	0.003 (0.004)	0.043*** (0.016)	0.003 (0.004)	0.040** (0.017)	0.001 (0.006)	0.058*** (0.021)	0.001 (0.006)	0.053*** (0.020)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.029	0.030	0.023	0.023	0.022	0.028	0.021	0.027	0.057	0.068	0.043	0.052
Obs.	3128	3126	3128	3126	1092	1092	1092	1092	741	741	741	741
villages	178	178	178	178	167	167	167	167	150	150	150	150

All columns here provide output of panel regressions on "L05: "Has your household lost any non-agricultural land (due to government or local authorities' expropriation) during the past 5 years?". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 16: Area of non-agricultural land expropriated, past 5 years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.238*** (0.091)	-0.239*** (0.091)			-0.194 (0.136)	-0.199 (0.139)			-0.166 (0.113)	-0.176 (0.116)		
DiD-treatment			-0.145*** (0.054)	-0.146*** (0.054)			-0.110 (0.081)	-0.110 (0.081)			-0.127** (0.053)	-0.134** (0.058)
Endline	0.267*** (0.088)	0.267*** (0.089)	0.165*** (0.053)	0.157*** (0.050)	0.202 (0.135)	0.224 (0.140)	0.119 (0.080)	0.127 (0.077)	0.222** (0.109)	0.299** (0.149)	0.155*** (0.059)	0.221** (0.099)
Constant	0.018 (0.019)	0.002 (0.053)	0.018 (0.019)	-0.019 (0.055)	0.011 (0.030)	0.048 (0.049)	0.011 (0.030)	0.022 (0.065)	0.000 (0.023)	0.174 (0.111)	0.000 (0.023)	0.164 (0.108)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.013	0.014	0.009	0.009	0.009	0.009	0.005	0.005	0.031	0.037	0.026	0.032
Obs.	3168	3166	3168	3166	1106	1106	1106	1106	748	748	748	748
villages	178	178	178	178	167	167	167	167	150	150	150	150

All columns here provide output of panel regressions on 'LOG': "What was the total area of the non-agricultural land that was lost due to government or local authorities' expropriation during the past 5 years?". Coefficient values are shown in acres. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

11 Findings-Conflict

Figure 29: Summary of Conflict Findings

Summary of Conflict Findings

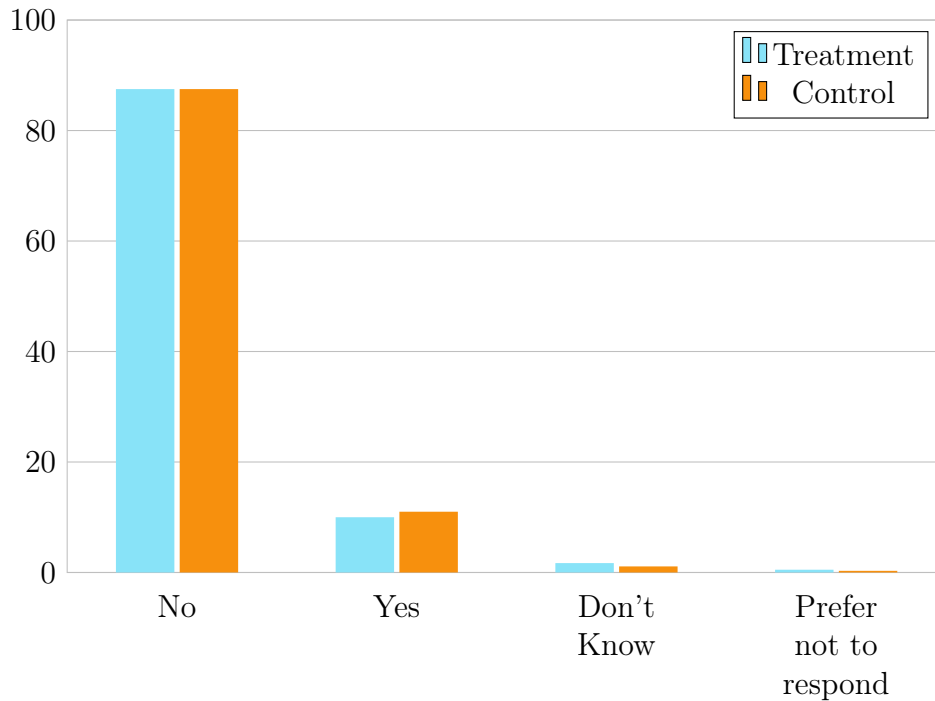
OUTCOME	EVALUATION FINDING	WOMEN	YOUTH
Land conflict	Improvement	Improvement	Improvement
REGRESSION INDICATORS			
Conflicts since 2017		Only ILGU direct beneficiaries	No change
Dispute over dwelling parcel	No change	No change	No change
Likelihood of ownership dispute	Only ILGU direct beneficiaries	No change	Only ILGU direct beneficiaries
Number of conflicts since 2017	Only ILGU direct beneficiaries	Only ILGU direct beneficiaries	Only ILGU direct beneficiaries
Perceived likelihood of dispute with landlord	No change	No change	No change
Fear of conflict	No change	No change	No change

At endline, conflicts were reported on 1 percent (108) of actively used Mailo tenant fields in the treatment area compared to 1 percent (66) of fields in control areas (Figure 30). Respondents reported conflicts on 7 percent (34) of tenant parcels that were mapped by ILGU. The average number of conflicts reported per field was just over one (1.35) for both treatment and control parcels. The average was similar for parcels mapped by ILGU (1.23).

Twenty-two percent (31) of reported conflicts in treatment areas relate to parcel boundaries, followed by inheritance/succession issues (17 percent, 23), landlords trying to remove squatting residents (14 percent, 19), and deliberate land grabbing/loss of land (13 percent, 18). In control areas, the most common causes of conflict are boundaries (33 percent, 28), inheritance/succession issues (25 percent, 22), and new landlords and conflict over existing use (17 percent, 15). Landlords (37 percent, 52) are the most common actor in conflicts in treatment areas, followed by neighbors (21 percent, 29), and other family members (14 percent, 19). The landlord survey reflected similar results with the two main causes of conflict being parcel boundary conflicts (38 percent) followed by inheritance/succession conflict (16 percent).

The top three actors are the same in control areas, though landlords are reported in a lower proportion of conflicts (29 percent, 25). Just under half of conflicts in treatment areas were described as very serious (49 percent, 68), compared to 59 percent (24) of conflicts on parcels mapped by ILGU and 59 percent (51) of conflicts in control areas. About one-fifth

Figure 30: Experienced dispute related to this parcel since 2017



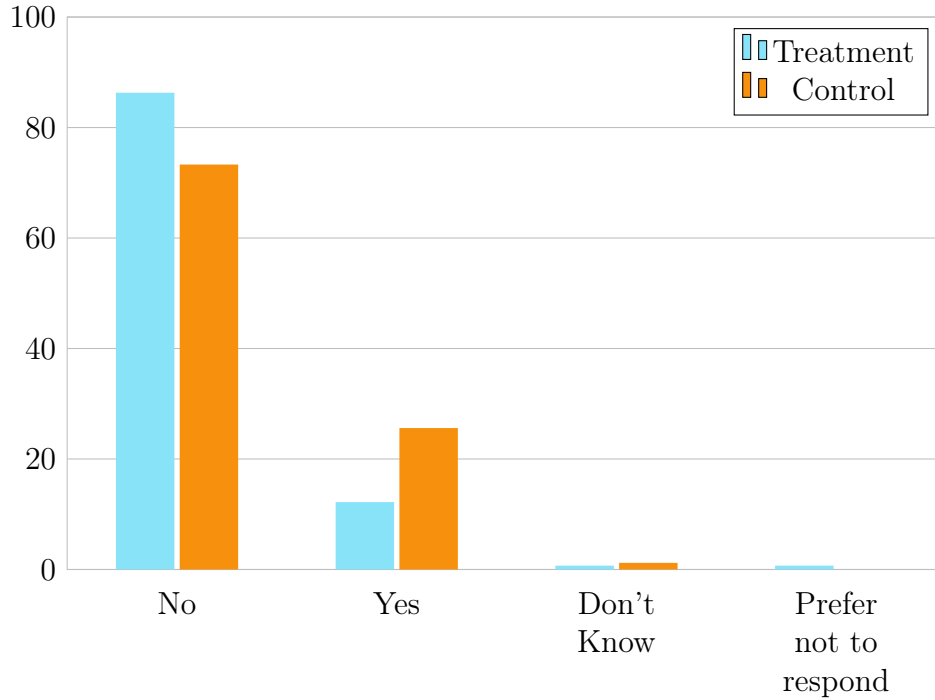
of conflicts led to violence (19 percent, 26, treatment and 20 percent, 17, control), and 14 percent (20) of conflicts in treatment areas led to the destruction of property (22 percent, 19, control).

In 12 percent (17) of conflicts, respondents lost land as a result of the dispute, compared to 26 percent (22) of conflicts in control areas (Figure 31). However, on parcels mapped by ILGU, only 7 percent (3) of conflicts resulted in loss of land. Treatment respondents reported losing an average of 8 acres (median 0.11) while control respondents lost an average of 2 acres (median 2).

Nineteen percent (27) of conflicts on treatment parcels affected activity on the parcel, compared to 28 percent (24) of conflicts on control parcels (Figure 32). The most commonly cited effects of the conflict on activities were following land during the conflict (33 percent, 9, treatment and 17 percent, 4, control) and postponement (22 percent, 6, treatment and 13 percent, 3, control) or prevention (15 percent, 4, treatment and 4 percent, 1, control) of harvest. In half of cases (50 percent, 12), control respondents also reported planting fewer crops, but this only occurred with two of treatment conflicts.

On average, disputes lasted for 2.5 years in treatment areas (three years in control areas), and respondents reported spending six months or more (49 percent, 68, treatment and 49 percent, 42, control) on resolving the conflict. In many cases (53 percent, 72, treatment and 50 percent, 36, control), conflicts did not cost respondents anything to resolve in terms of

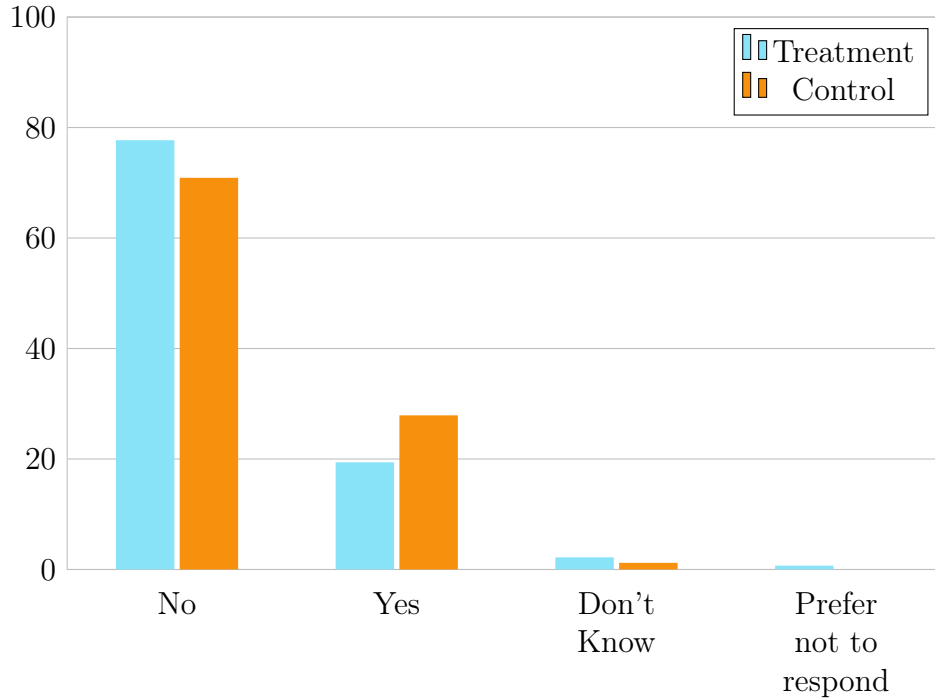
Figure 31: Lost land as a result of dispute



administration fees, mapping, transportation, acquiring documents, etc. In cases when they did incur costs, treatment respondents reported that it cost them an average of \$305 USD (median \$80 USD), compared to \$1,037 USD (median \$53 USD) for control respondents.

Respondents report that they utilized land dispute resolution in the last five years, including during the boundary mapping process or via referral to the ADRM mechanisms and courts, during the course of 35 percent (48) of conflicts in treatment areas and 26 percent (22) of conflicts in controls. Participating respondents in treatment areas report satisfaction with the dispute resolution process in half of conflicts (52 percent, 25) and dissatisfaction with the process for a third of conflicts (31 percent, 15). Most dissatisfied respondents chose that the process should be improved by providing more clarity about the process (55 percent, 12). The LC1 court mediated 54 percent (26) of disputes in treatment areas (68 percent [15] in controls), followed by traditional leaders (15 percent [7] treatment and 5 percent [1] control), the RDC (13 percent [6] treatment and 23 percent [5], control), community legal volunteers (8 percent [4] treatment and 22 percent [5] control), courts of law (8 percent [4] treatment, and 23 percent [5] control), paralegals (8 percent [4] treatment, and 9 percent [2] control), and the mapping team (8 percent [4] treatment, 0 control), in descending order for treatment areas (Figure 33). In terms of the effectiveness of different entities that participated in mediating these land disputes, respondents report the most confidence with the LC1, which was most often rated "very effective" (9 treatment and 6 control), and the least confidence

Figure 32: Conflict affected activity on this parcel

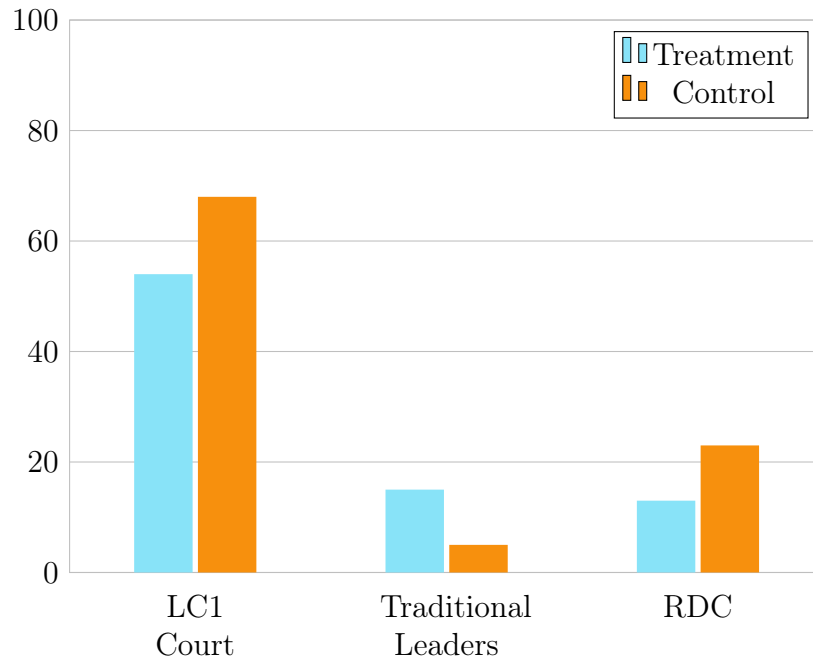


in the Alternative Dispute Resolution Committee, which was not rated "very effective" in any instances. Similarly, 31 percent of landlords in the treatment group were very satisfied, whereas 25 percent were neither satisfied nor unsatisfied.

Fifty-eight percent (28) of these conflicts in treatment areas have been resolved (50 percent [11] in control areas). In the vast majority of cases, respondents are very or moderately confident that the resolution will stand (89 percent [25] treatment and 100 percent [11] control). For conflicts referred to dispute resolution and resolved, most were resolved at the LC1 Court level (7), followed by RDC (7) and paralegal (7) in treatment areas. In many cases, in treatment areas (44 percent, 21), the outcome of the resolution was recovering land rights (23 percent [5] in controls), followed by sharing part of the land (13 percent [6] treatment, and 14 percent [3] control) and paying out money for the land (4 percent [2] treatment, and 9 percent [2] control). In most resolved conflicts, the parties have completed the step of mediation between the conflicting parties (61 percent [17] treatment and 27 percent [3] control). In many cases, they had also undertaken mapping and boundary demarcation (29 percent [8] treatment and 27 percent [3] control) or community consultations (14 percent [4] treatment and 27 percent [3] control). The current status of most unresolved conflicts is referred to ADRM or the court (50 percent [10] treatment, and 36 percent [4] control).

Treatment respondents with resolved conflicts on their parcels reported that the main benefits of the dispute resolution process were clear boundaries (41 percent, 18) and clear

Figure 33: Top three entities involved in mediating land disputes



use rights (39 percent, 17). A third of treatment respondents with resolved conflicts (32 percent, 14) reported no benefits with the dispute resolution process. Results were similar among control respondents and respondents with parcels mapped by ILGU.

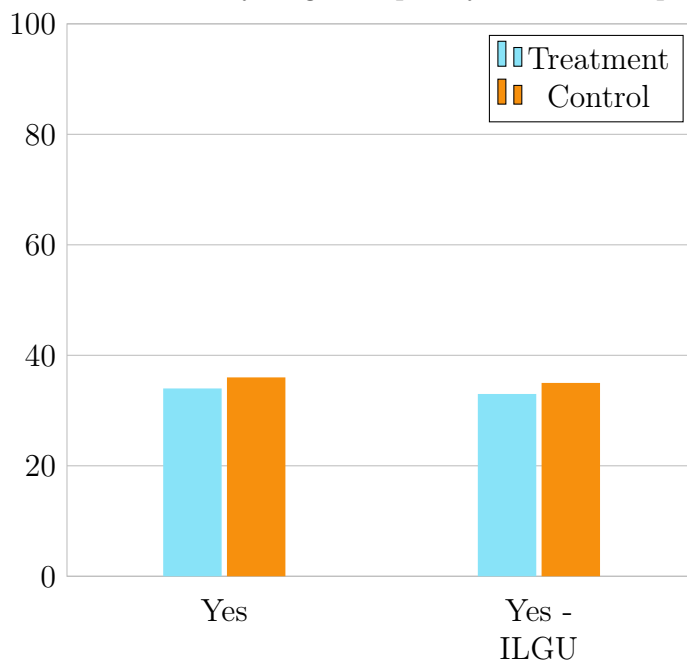
Eighty-one (590) percent of parcel managers in treatment areas and 89 percent (395) of managers of mapped parcels who were aware of the project affirmed that the land mapping process, public awareness-raising, and conflict resolution processes changed their concern over someone encroaching on or taking property. However, as noted in the tenure security section above, there is no evidence of a treatment effect for indicators of perceived tenure security. Interestingly, 45 percent (49) of managers aware of the project in control areas also agreed that it had changed their concern over someone taking their property. In control areas, most managers (59 percent, 29) reported increased concern and 37 percent (18) reported decreased concern. In treatment areas, most managers (58 percent, 345) reported decreased concern and 39 percent (228) reported increased concern. Treatment respondents reported that the mapping and demarcation intervention (65 percent, 381) was the biggest contributor to changes in perceived tenure security, followed by public outreach and awareness-raising on land rights (28 percent, 168). Results were similar among managers of parcels mapped by ILGU.

Overall, the majority (88 percent) of landlords report that they have not experienced parcel disputes; however, slightly less than half of landlords indicate that the ILGU activities have reduced concerns of encroachment or improved perceived tenure security. However, only

47 percent of landlords reported that the ILGU mapping/demarcation process and conflict resolution process changed their concern over someone encroaching or taking their property. While 43 percent of landlords believed that the ILGU project did not change their concern over their property being encroached upon, 49 percent reported that the project’s mapping and boundary demarcation was the biggest contributor to perceived tenure security.

Thirty-four percent of treatment respondents and 36 percent of control respondents report that they are concerned that somebody might dispute their ownership rights to the parcel (Figure 34). Similarly, among those mapped by ILGU, this is 33 percent of treatment and 35 percent of control respondents. Respondents on 37 percent of treatment parcels (compared to 28 percent of control parcels) noted that it was at least slightly likely that there would be disagreement over the ownership rights to the parcel in the next five years with a private party (excluding expropriation by the government).

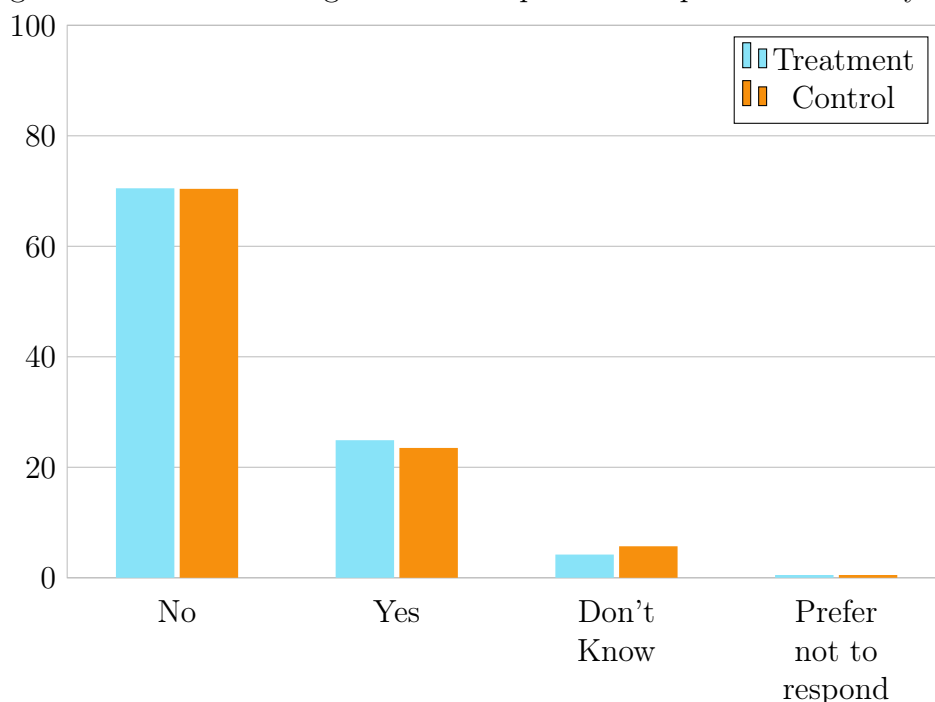
Figure 34: Concerned that somebody might dispute your ownership rights on this parcel



In terms of worry over future conflict, treatment respondents reported being afraid of being in a land dispute on about one quarter of their parcels (25 percent, 262) in the next five years, and responses were similar for controls (23 percent, 141) and for parcels mapped by GIZ (23 percent, 114) (Figure 35). The actors most often cited that managers worry they could be in conflict with are a member of their household (14 percent, 36) and the government (8 percent, 20). While 11 percent (16) of control managers report concern about conflict with field neighbors, only 6 percent (17) of treatment managers share this concern. Similarly, only 26 percent of landlords reported being afraid of being in another land dispute

about this parcel over the next five years.

Figure 35: Afraid of being in a land dispute about parcel in next 5 years



11.1 Regression Analysis

Panel indicators

Overall, the panel results indicate that ILGU has reduced conflict in the study area, including reductions in conflict occurrence and reductions in the perceived likelihood of conflict. These results are more clearly evident, robust, and substantive for direct project beneficiaries. Treatment respondents are approximately 5 percentage points less likely to have experienced a conflict on their parcel since 2017, and this is even higher, at 5.7 to 5.8 percentage points, for the aggregate direct project beneficiaries. While there are no ITT treatment effects for women, there are large and significant effects for women who were direct project beneficiaries; these respondents were almost 11 percentage points less likely to have experienced a parcel conflict than their control counterparts. Similarly, for the perceived likelihood of an ownership dispute, there are positive treatment effects for direct ILGU beneficiaries for the aggregate sample and youth-headed households, although no change for women.

Table 17: Have there been conflicts on parcel since 2017?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.049** (0.024)	-0.050** (0.024)			-0.018 (0.044)	-0.029 (0.046)			-0.052 (0.048)	-0.033 (0.050)		
DiD-treatment			-0.058*** (0.021)	-0.057*** (0.021)			-0.105** (0.041)	-0.109** (0.042)			-0.016 (0.053)	0.012 (0.054)
Endline	0.045** (0.019)	0.050** (0.021)	0.033** (0.015)	0.034* (0.018)	0.045 (0.031)	0.072* (0.043)	0.060** (0.026)	0.077** (0.035)	0.071* (0.039)	0.018 (0.054)	0.047 (0.033)	-0.022 (0.048)
Constant	0.091*** (0.005)	0.113*** (0.033)	0.088*** (0.012)	0.105*** (0.036)	0.096*** (0.009)	0.162*** (0.056)	0.102*** (0.019)	0.169*** (0.056)	0.079*** (0.009)	0.015 (0.086)	0.111*** (0.024)	0.031 (0.086)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.003	0.004	0.005	0.005	0.005	0.009	0.015	0.020	0.009	0.021	0.012	0.036
Obs.	4058	4057	3371	3371	1343	1343	1116	1116	899	899	709	709
villages	178	178	175	175	167	167	159	159	146	146	137	137

All columns here provide output of panel regressions on 'conflictyn': "Thinking back since 2017, did you or anyone in your household have any disputes related to the parcel?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 18: Dispute over dwelling parcel in past 12 months

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.044 (0.027)	-0.047* (0.027)			-0.051 (0.045)	-0.068 (0.047)			-0.084 (0.056)	-0.078 (0.056)		
DiD-treatment			-0.022 (0.029)	-0.021 (0.029)			-0.040 (0.058)	-0.043 (0.058)			-0.012 (0.057)	-0.004 (0.057)
Endline	0.080*** (0.020)	0.105*** (0.023)	0.060*** (0.015)	0.081*** (0.018)	0.138*** (0.036)	0.190*** (0.048)	0.119*** (0.026)	0.156*** (0.036)	0.109** (0.045)	0.083* (0.048)	0.058* (0.034)	0.031 (0.041)
Constant	0.111*** (0.007)	0.208*** (0.044)	0.111*** (0.007)	0.204*** (0.045)	0.108*** (0.011)	0.253*** (0.079)	0.108*** (0.011)	0.241*** (0.078)	0.100*** (0.014)	0.059 (0.103)	0.100*** (0.014)	0.055 (0.104)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.015	0.019	0.013	0.017	0.050	0.061	0.049	0.058	0.022	0.025	0.014	0.019
Obs.	2795	2793	2795	2793	964	964	964	964	609	609	609	609
villages	178	178	178	178	167	167	167	167	145	145	145	145

All columns here provide output of panel regressions on 's5q13': "Did you have any land dispute or disagreements with anyone over this parcel/property during the past 12 months?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 19: Perceived likelihood of a dispute over ownership rights to dwelling parcel (for > 50%)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.045 (0.032)	-0.047 (0.032)			0.009 (0.054)	0.005 (0.053)			-0.070 (0.067)	-0.070 (0.067)		
DiD-treatment			-0.105*** (0.035)	-0.103*** (0.034)			-0.054 (0.069)	-0.055 (0.070)			-0.134* (0.071)	-0.128* (0.072)
Endline	0.195*** (0.021)	0.215*** (0.026)	0.200*** (0.019)	0.217*** (0.022)	0.172*** (0.041)	0.195*** (0.049)	0.192*** (0.028)	0.213*** (0.040)	0.215*** (0.047)	0.268*** (0.067)	0.215*** (0.036)	0.264*** (0.055)
Constant	0.102*** (0.008)	0.190*** (0.055)	0.101*** (0.008)	0.185*** (0.054)	0.095*** (0.013)	0.188* (0.105)	0.095*** (0.013)	0.190* (0.107)	0.105*** (0.017)	0.279*** (0.106)	0.104*** (0.016)	0.266** (0.105)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.092	0.096	0.099	0.102	0.104	0.108	0.106	0.110	0.093	0.102	0.102	0.110
Obs.	2802	2800	2802	2800	971	971	971	971	610	610	610	610
villages	178	178	178	178	167	167	167	167	145	145	145	145

All columns here provide output of panel regressions on 's5q15': "How likely do you think that there would be disagreement over the ownership rights to this parcel/property in the next 5 years with a private party (excluding expropriation by the government)?" Choices were presented alongside percent values; this dependent variable was constructed using a binary flag where responses viewing the likelihood of a dispute as over 50% were assigned 1, otherwise 0. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35, flag if HH member has held notable office. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 20: Perceived likelihood of a dispute over ownership rights to dwelling parcel (as a %)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.024 (0.022)	-0.024 (0.022)			0.031 (0.039)	0.026 (0.038)			-0.050 (0.047)	-0.045 (0.047)		
DiD-treatment			-0.063*** (0.023)	-0.062*** (0.023)			-0.014 (0.046)	-0.015 (0.047)			-0.115*** (0.044)	-0.104** (0.045)
Endline	0.147*** (0.016)	0.150*** (0.018)	0.152*** (0.013)	0.154*** (0.016)	0.124*** (0.030)	0.142*** (0.034)	0.145*** (0.020)	0.163*** (0.028)	0.167*** (0.036)	0.194*** (0.051)	0.173*** (0.026)	0.199*** (0.040)
Constant	0.097*** (0.006)	0.130*** (0.036)	0.097*** (0.005)	0.127*** (0.036)	0.094*** (0.009)	0.157** (0.069)	0.094*** (0.009)	0.163** (0.071)	0.098*** (0.011)	0.225*** (0.076)	0.096*** (0.011)	0.215*** (0.075)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.116	0.119	0.121	0.124	0.137	0.140	0.136	0.139	0.117	0.131	0.131	0.143
Obs.	2802	2800	2802	2800	971	971	971	971	610	610	610	610
villages	178	178	178	178	167	167	167	167	145	145	145	145

All columns here provide output of panel regressions on 's5q15': "How likely do you think that there would be disagreement over the ownership rights to this parcel/property in the next 5 years with a private party (excluding expropriation by the government)?" Choices were presented alongside percent values; this dependent variable was constructed using proportion between 0 and 1 corresponding to the choices. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Cross-Sectional Indicators

For cross-sectional indicators, the only indicator with robust and consistent findings is "number of conflicts since 2017," with positive treatment effects for those mapped by ILGU that are in line with the panel analysis.

Table 21: Number of conflicts about parcel since 2017

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	-0.010 (0.029)	-0.023 (0.037)			-0.010 (0.047)	-0.042 (0.074)			-0.105 (0.066)	-0.158** (0.076)		
Treated			-0.092*** (0.023)	-0.094*** (0.032)			-0.095** (0.040)	-0.138** (0.061)			-0.122*** (0.046)	-0.114** (0.047)
Constant	0.149*** (0.024)	0.065 (0.071)	0.170*** (0.017)	0.085 (0.066)	0.171*** (0.037)	0.303*** (0.098)	0.189*** (0.028)	0.309*** (0.073)	0.216*** (0.061)	0.201** (0.099)	0.189*** (0.041)	0.121 (0.106)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.000	0.010	0.007	0.017	0.000	0.012	0.007	0.024	0.010	0.072	0.013	0.061
Obs.	1615	1065	1615	1065	533	343	533	343	373	229	373	229
villages	175	163	175	163	150	121	150	121	131	102	131	102

All columns here provide output of endline cross-sectional regressions on 'conflicts': "Thinking back since 2017, how many land disputes have there been?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

12 Finding-Investment and Productivity

Figure 36: Summary of Investment and Productivity Findings

Summary of Investment Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH	LARGE LAND-HOLDER	TENANT RELATED TO LANDLORD
Investments	(Weak) Mixed	Partial improvement	No change	No change	No change
REGRESSION INDICATORS					
Fallowed parcel	No change	No change	No change	No change	No change
Years fallowed	No change	No change			
Pesticide use	No change	No change			
Pesticide purchase	Very weak - only ILGU direct beneficiaries	No change			
Organic fertilizer	Only ILGU direct beneficiaries	No change			
Inorganic fertilizer	No change	No change			
Field labor	No change	No change			
Irrigation	No change	No change			
Buildings	No change	No change			
Erosion control	No change	No change			
Improved seeds	No change	No change			
Payment for improved seeds	No change				
Coffee planting	No change	No change			
Tree planting	No change	No change			
Dwelling quality	No change	No change			

This summary table presents robust ATT results. For a full summary of investment results, please refer to Annex D.

The descriptive statistics show a large amount of parcel and dwelling investment in the study area. Approximately 71 percent of respondents in both treatment and control communities note that there have been changes to the dwelling since baseline. Approximately 60 percent of respondents report the presence of permanent or semi-permanent buildings, huts,

and sheds. Similarly, approximately 88 percent of respondents report that they have left at least some part of their parcel fallow for an agricultural season over the past five years. Twenty-seven percent of respondents report an erosion control/water harvesting facility on the parcel.

In contrast, most parcels are rain-fed (77 percent) or swamp/wetland (14 percent). Only 2.2 percent of fields are irrigated; descriptively, this is equivalent between treatment and control respondents (2 percent control, 2 percent treatment).

Figure 37: Endline investment descriptives

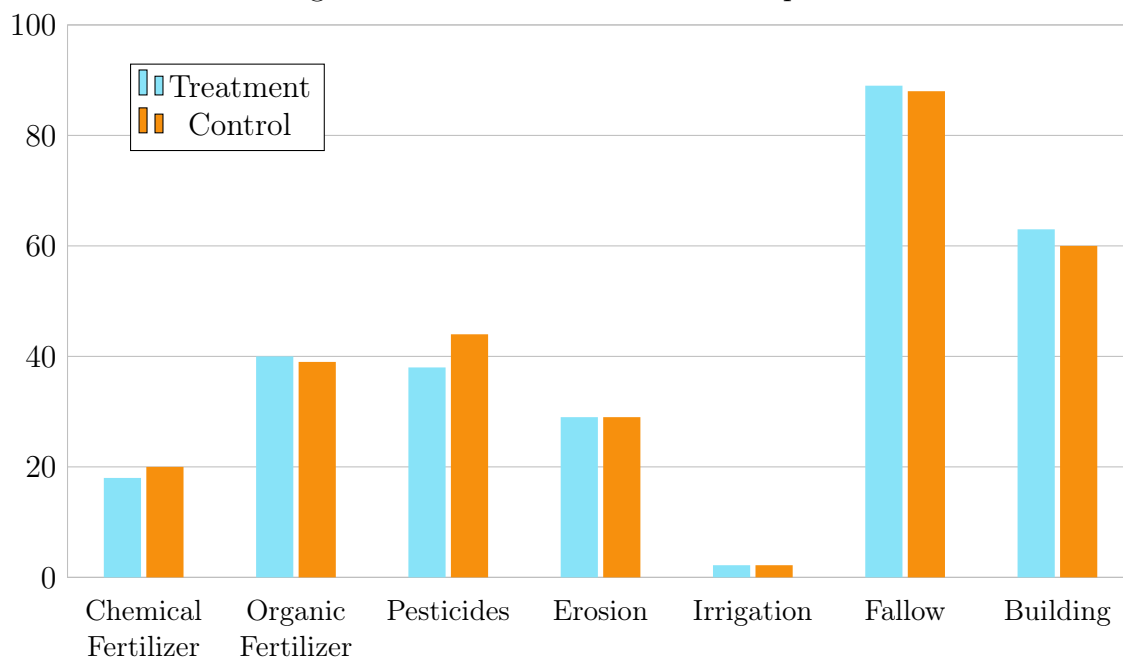


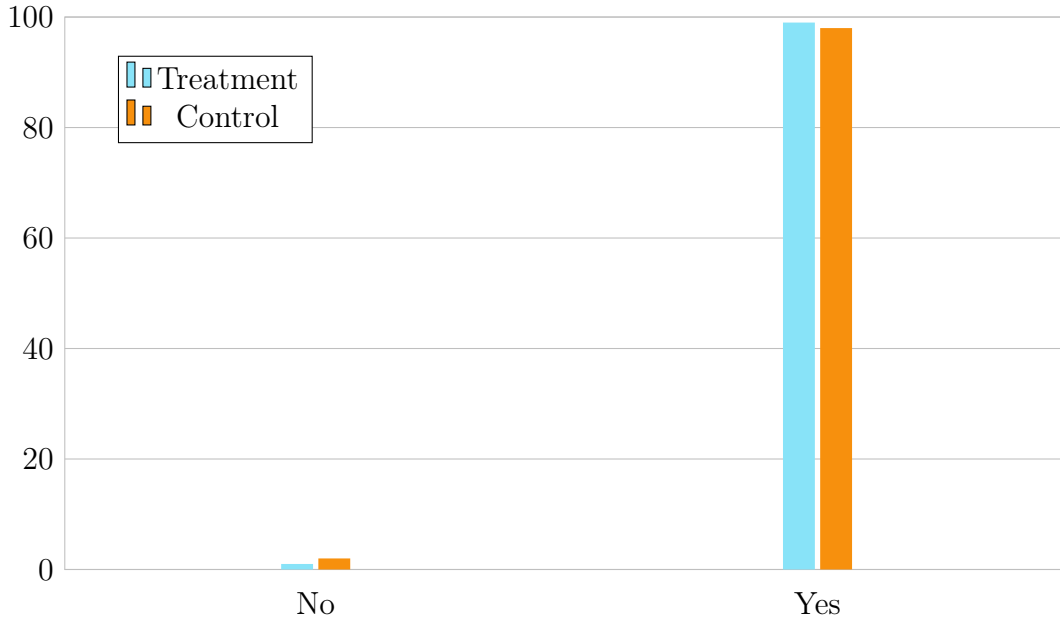
Figure 37 displays the endline investment descriptive statistics and highlights the similarity of responses between treatment and control groups.

12.1 Regression Analysis

For the panel analysis on various investment indicators, there was generally evidence of null treatment effects with some instances of mixed negative and positive treatment effects. Thus, not surprisingly, there is no evidence of a treatment effect on productivity indicators, including the total value of crops sold and expected value of crops sold at the point of data collection. Overall, there is no clear story of investment and productivity effects.

There is weak evidence of increased fallowing by women in the treatment area, although the findings are cross-sectional and not robust to different specifications. Women in the treatment area are more likely to have left their parcel fallow (3.7 percentage points) over

Figure 38: Purchased pesticides



the past five years and have left their parcel fallow for about one year longer than their control counterparts.

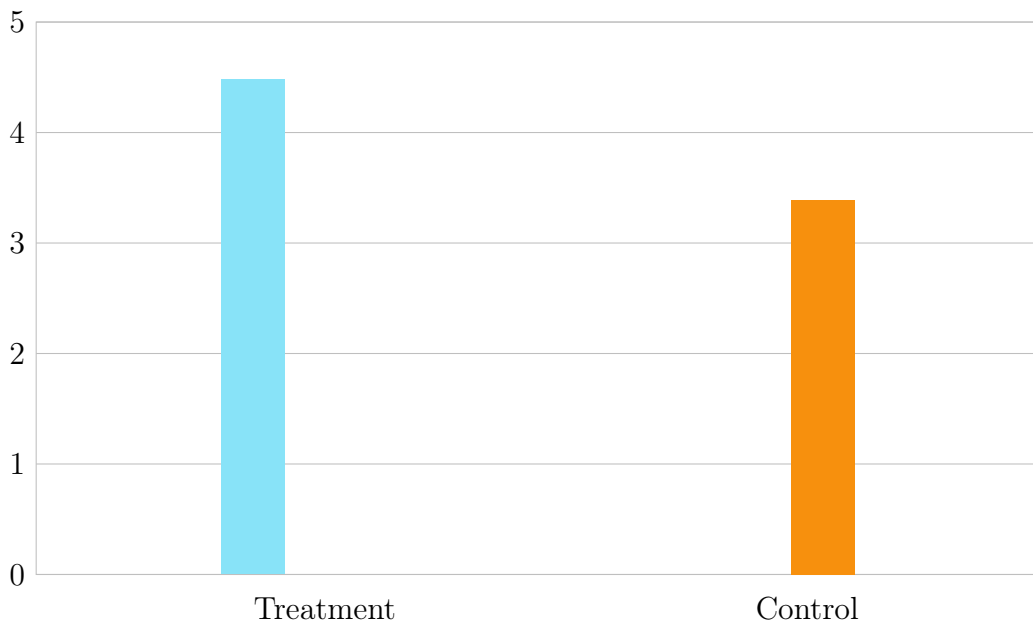
Respondents in the treatment area are 2.1 percentage points less likely to irrigate their parcel, although this finding does not hold for direct program beneficiaries. Similarly, for person days hired, there are generally null treatment effects except for youth in the treatment area who report 2.5 to 3.3 days lower person days hired-but this finding is not robust among direct youth beneficiaries.

The program effects for inorganic or chemical fertilizer use are generally null. Program beneficiaries are about 8 percentage points less likely to use organic fertilizer. This might be driven by women, where there is weak evidence that women are 9 percentage points less likely to use organic fertilizer. Use of pesticides shows mixed results. While weakly significant, direct project beneficiaries are slightly (2.6 percentage points) more likely to have purchased pesticides. Youth in the treatment area are 14.9 to 15.7 percentage points less likely to have applied pesticides to their parcel; this negative finding disappears for direct program beneficiaries.

Effects for construction of building structures and use of improved seeds are null across all groups and specifications. Similarly, erosion control and water harvesting facility are null for most groups and specifications. Youth are 11.6 to 12.9 percentage points more likely to report erosion control or water harvesting facilities on their parcel, although this finding is weakly significant and not robust among direct youth beneficiaries.

There are consistently negative treatment effects for electricity on the primary par-

Figure 39: Person days hired



cel among the aggregate treatment sample and youth-headed respondents. For dwelling investments-including building materials, number of rooms, and electricity-there are mostly null effects, while the negative findings for youth are likely driven by the inclusion of electricity in the dwelling quality index.

Overall, there is no clear investment story and there is little evidence that the program improved outcomes through the expected investment pathway. These findings are consistent with other land evaluations that find negative investment results. One theory for this is that documentation serves as a substitution effect. With documents that help secure tenure, individuals can relax investments that were previously needed to secure tenure. The resources that were previously used for field investment could be freed up for use on other household objectives such as durable assets, health and education expenditures, and other livelihood indicators. We examined several livelihood indicators (below) to assess whether there is evidence of the positive program results seen above (stronger land rights, perceived tenure security, and lower conflict) on livelihood indicators.

Table 22: Fallowed parcel over past 5 years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	-0.000 (0.013)	-0.009 (0.019)			0.037** (0.018)	0.020 (0.023)			-0.036 (0.030)	-0.014 (0.037)		
Treated			0.015 (0.017)	0.011 (0.019)			0.017 (0.027)	0.004 (0.025)			-0.006 (0.032)	0.021 (0.041)
Constant	0.098*** (0.010)	0.105*** (0.039)	0.087*** (0.008)	0.095*** (0.035)	0.056*** (0.012)	0.040 (0.033)	0.068*** (0.012)	0.054 (0.034)	0.139*** (0.025)	0.123 (0.085)	0.104*** (0.019)	0.103 (0.085)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.000	0.007	0.001	0.008	0.005	0.008	0.001	0.006	0.003	0.020	0.000	0.020
Obs.	2357	1071	1699	1071	738	346	555	346	636	232	410	232
villages	177	163	175	163	163	123	156	123	152	102	138	102

All columns here provide output of endline cross-sectional regressions on 'f30': "Have you left this parcel fallow for any agricultural season over the past 5 years?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 23: Years parcel has been fallow in past 7 years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	0.121 (0.261)	-0.084 (0.521)			1.092** (0.412)	0.695 (1.224)			0.042 (0.436)	-1.524 (1.739)		
Treated			-0.232 (0.349)	-0.704 (0.459)			1.143 (0.972)	1.624 (1.217)			0.154 (0.613)	-2.115 (1.332)
Constant	1.942*** (0.179)	2.055*** (0.747)	2.136*** (0.196)	2.334*** (0.711)	1.176*** (0.095)	0.637 (1.710)	1.857*** (0.380)	1.082 (0.695)	1.909*** (0.280)	2.139 (3.371)	2.000*** (0.350)	0.824 (2.648)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.001	0.033	0.003	0.059	0.069	0.100	0.059	0.299	0.000	0.274	0.001	0.375
Obs.	230	94	155	94	58	19	40	19	74	21	42	21
villages	128	71	103	71	48	17	36	17	51	20	37	20

All columns here provide output of endline cross-sectional regressions on 'f31': "Which year(s) did you leave the parcel fallow?". The dependent variable was a count of years in the past 7 the parcel has been fallow. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if related to landlord, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 24: Irrigation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.021** (0.009)	-0.021** (0.009)			-0.019 (0.013)	-0.016 (0.013)			0.003 (0.018)	0.003 (0.021)		
DiD-treatment			-0.005 (0.010)	-0.004 (0.010)			0.012 (0.015)	0.013 (0.015)			-0.015 (0.026)	-0.012 (0.027)
Endline	0.031*** (0.007)	0.029*** (0.008)	0.013** (0.005)	0.007 (0.007)	0.027*** (0.010)	0.021* (0.012)	0.002 (0.007)	-0.003 (0.011)	0.025* (0.013)	0.030 (0.023)	0.033*** (0.012)	0.026 (0.017)
Constant	0.005** (0.002)	0.003 (0.011)	0.008* (0.004)	-0.006 (0.012)	0.005 (0.003)	0.000 (0.021)	0.004 (0.006)	-0.008 (0.023)	0.006 (0.004)	0.014 (0.021)	0.019* (0.010)	0.007 (0.031)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.011	0.012	0.005	0.006	0.010	0.014	0.004	0.006	0.014	0.014	0.020	0.021
Obs.	4830	4828	3465	3465	1551	1551	1141	1141	1139	1139	744	744
villages	178	178	175	175	167	167	159	159	148	148	138	138

All columns here provide output of panel regressions on 'i53': "Is this parcel irrigated?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 25: Person days hired

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.734 (1.363)	0.736 (1.372)			-0.285 (1.409)	-0.029 (1.806)			-2.518* (1.406)	-3.285** (1.452)		
DiD-treatment			0.190 (1.498)	0.092 (1.500)			2.815 (3.302)	2.526 (3.022)			1.144 (3.154)	1.289 (2.822)
Endline	-0.980 (1.200)	-1.337 (1.313)	0.392 (0.598)	-0.357 (1.091)	-0.295 (0.620)	-1.767 (2.197)	-0.686 (0.663)	-3.438 (2.277)	0.932 (1.074)	4.963** (2.047)	0.722 (1.253)	3.019 (1.969)
Constant	4.371*** (0.349)	1.974 (2.787)	4.042*** (0.502)	0.374 (2.922)	3.433*** (0.434)	-1.644 (6.158)	3.228*** (0.503)	-7.163 (7.580)	5.101*** (0.404)	12.464*** (3.263)	5.266*** (1.500)	11.447** (4.848)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.000	0.001	0.000	0.002	0.001	0.007	0.003	0.021	0.003	0.016	0.004	0.009
Obs.	4095	4093	3005	3005	1330	1330	1004	1004	960	960	646	646
villages	178	178	175	175	166	166	159	159	148	148	138	138

All columns here provide output of panel regressions on the sum of answers to 's3aq35': "How many person days of men/women/children did you hire?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 26: Outbuildings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.013 (0.024)	0.017 (0.023)			-0.023 (0.036)	-0.026 (0.036)			0.072 (0.050)	0.067 (0.050)		
DiD-treatment			0.039 (0.030)	0.042 (0.030)			0.018 (0.044)	0.009 (0.045)			0.082 (0.066)	0.104 (0.069)
Endline	0.039** (0.018)	0.025 (0.021)	0.046*** (0.015)	0.016 (0.018)	0.060** (0.028)	0.058* (0.034)	0.016 (0.024)	-0.016 (0.027)	0.027 (0.041)	0.044 (0.049)	0.041 (0.036)	-0.000 (0.050)
Constant	0.490*** (0.006)	0.463*** (0.033)	0.497*** (0.021)	0.404*** (0.045)	0.550*** (0.009)	0.522*** (0.054)	0.539*** (0.031)	0.417*** (0.077)	0.406*** (0.012)	0.412*** (0.075)	0.504*** (0.042)	0.457*** (0.104)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.003	0.004	0.014	0.017	0.003	0.004	0.020	0.026	0.010	0.010	0.012	0.019
Obs.	4800	4798	3444	3444	1541	1541	1132	1132	1136	1136	742	742
villages	178	178	175	175	166	166	159	159	148	148	138	138

All columns here provide output of panel regressions on "s2bq45": "Does the parcel have any permanent or semi-permanent buildings, hut, shed, etc?". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 27: Organic fertilizer

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.023 (0.035)	-0.022 (0.035)			-0.084 (0.054)	-0.090* (0.052)			-0.051 (0.062)	-0.065 (0.063)		
DiD-treatment			-0.080** (0.037)	-0.083** (0.037)			-0.080 (0.065)	-0.081 (0.063)			-0.068 (0.072)	-0.088 (0.077)
Endline	0.083*** (0.028)	0.070** (0.031)	0.114*** (0.023)	0.086*** (0.028)	0.119*** (0.044)	0.112** (0.048)	0.115*** (0.034)	0.086** (0.042)	0.124** (0.051)	0.182*** (0.064)	0.130*** (0.043)	0.118* (0.061)
Constant	0.291*** (0.010)	0.232*** (0.049)	0.287*** (0.022)	0.148** (0.059)	0.280*** (0.015)	0.132* (0.073)	0.262*** (0.030)	0.032 (0.094)	0.218*** (0.017)	0.303*** (0.098)	0.206*** (0.042)	0.099 (0.126)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.010	0.010	0.020	0.025	0.015	0.032	0.024	0.048	0.021	0.024	0.033	0.039
Obs.	4102	4100	3010	3010	1330	1330	1003	1003	962	962	648	648
villages	178	178	175	175	166	166	159	159	148	148	138	138

All columns here provide output of panel regressions on "s3aq04": "Did you use any organic fertilizer on the parcel/plot?". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 28: Inorganic or chemical fertilizer

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.033 (0.027)	0.033 (0.028)			0.071 (0.045)	0.075* (0.045)			0.036 (0.065)	0.037 (0.067)		
DiD-treatment			-0.026 (0.034)	-0.026 (0.034)			-0.026 (0.050)	-0.028 (0.051)			-0.025 (0.092)	-0.025 (0.094)
Endline	0.005 (0.021)	0.000 (0.026)	0.053*** (0.017)	0.041* (0.022)	-0.005 (0.038)	-0.028 (0.043)	0.062** (0.027)	0.047 (0.035)	0.032 (0.051)	0.048 (0.071)	0.097** (0.043)	0.093 (0.060)
Constant	0.163*** (0.008)	0.147*** (0.045)	0.146*** (0.018)	0.088 (0.057)	0.133*** (0.012)	0.018 (0.050)	0.099*** (0.028)	-0.025 (0.071)	0.195*** (0.019)	0.259*** (0.097)	0.174*** (0.047)	0.160 (0.130)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.003	0.003	0.007	0.009	0.009	0.014	0.012	0.021	0.007	0.009	0.020	0.020
Obs.	4095	4093	3004	3004	1328	1328	1001	1001	959	959	647	647
villages	178	178	175	175	166	166	159	159	148	148	138	138

All columns here provide output of panel regressions on 's3aq13': "Did you use any inorganic/ chemical fertilizer on the parcel/plot?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 29: Pesticides

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.049 (0.039)	-0.053 (0.039)			-0.035 (0.056)	-0.034 (0.057)			-0.157* (0.082)	-0.149* (0.083)		
DiD-treatment			-0.050 (0.044)	-0.051 (0.043)			-0.063 (0.058)	-0.060 (0.058)			-0.106 (0.100)	-0.097 (0.103)
Endline	0.050 (0.032)	0.065* (0.037)	0.059** (0.025)	0.075** (0.031)	0.045 (0.047)	0.045 (0.055)	0.043 (0.036)	0.068 (0.046)	0.116* (0.063)	0.126 (0.084)	0.081 (0.055)	0.085 (0.076)
Constant	0.385*** (0.011)	0.414*** (0.048)	0.395*** (0.023)	0.405*** (0.060)	0.335*** (0.015)	0.343*** (0.084)	0.324*** (0.030)	0.383*** (0.107)	0.438*** (0.024)	0.527*** (0.114)	0.460*** (0.053)	0.473*** (0.156)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.002	0.003	0.005	0.010	0.002	0.002	0.003	0.005	0.009	0.014	0.009	0.023
Obs.	4091	4089	3005	3005	1328	1328	1002	1002	957	957	645	645
villages	178	178	175	175	166	166	159	159	148	148	138	138

All columns here provide output of panel regressions on 's3aq22': "Did you use any pesticides on the parcel/plot?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 30: Pesticide purchases

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.006 (0.023)	0.004 (0.023)			-0.036 (0.035)	-0.043 (0.042)			0.060 (0.040)	0.058 (0.043)		
DiD-treatment			0.026* (0.014)	0.026* (0.015)			0.022 (0.022)	0.019 (0.019)			0.013 (0.013)	-0.000 (0.005)
Endline	-0.025 (0.021)	-0.026 (0.024)	-0.026* (0.014)	-0.031 (0.020)	0.000 (.)	0.022 (0.023)	-0.020 (0.020)	-0.011 (0.012)	-0.060 (0.040)	-0.056 (0.042)	-0.013 (0.013)	-0.001 (0.004)
Constant	0.997*** (0.006)	0.976*** (0.020)	1.000*** (0.008)	0.970*** (0.022)	1.006*** (0.011)	1.051*** (0.057)	1.005*** (0.011)	1.029*** (0.037)	0.999*** (0.008)	0.989*** (0.021)	0.988*** (0.006)	0.987*** (0.012)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.012	0.016	0.014	0.022	0.036	0.046	0.020	0.024	0.036	0.051	0.004	0.020
Obs.	1450	1449	1102	1102	416	416	312	312	376	376	277	277
villages	176	176	172	172	145	145	131	131	127	127	112	112

All columns here provide output of panel regressions on 's3aq25a': "Was any of Insecticides used purchased?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 31: Erosion control

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.043 (0.034)	0.044 (0.033)			0.007 (0.055)	0.020 (0.055)			0.129* (0.069)	0.116* (0.067)		
DiD-treatment			-0.029 (0.041)	-0.032 (0.040)			-0.018 (0.069)	-0.008 (0.064)			0.119 (0.089)	0.096 (0.089)
Endline	-0.105*** (0.026)	-0.127*** (0.028)	-0.066*** (0.022)	-0.101*** (0.026)	-0.069 (0.043)	-0.098* (0.053)	-0.067** (0.033)	-0.126*** (0.043)	-0.178*** (0.060)	-0.186*** (0.069)	-0.143*** (0.046)	-0.154** (0.066)
Constant	0.352*** (0.008)	0.231*** (0.055)	0.371*** (0.016)	0.199*** (0.059)	0.318*** (0.013)	0.184** (0.081)	0.360*** (0.025)	0.113 (0.085)	0.314*** (0.016)	0.214** (0.096)	0.312*** (0.033)	0.205* (0.116)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.013	0.021	0.012	0.026	0.009	0.021	0.013	0.035	0.027	0.035	0.033	0.041
Obs.	4777	4775	3428	3428	1532	1532	1127	1127	1132	1132	741	741
villages	178	178	175	175	166	166	159	159	148	148	138	138

All columns here provide output of panel regressions on 's2bq54': "Is there any erosion control/water harvesting facility on this parcel?" Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 32: Using improved seeds: Y/N

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.012 (0.027)	0.012 (0.027)			-0.009 (0.038)	-0.009 (0.039)			0.044 (0.057)	0.039 (0.058)		
DiD-treatment			-0.027 (0.029)	-0.027 (0.029)			-0.041 (0.047)	-0.042 (0.048)			0.002 (0.063)	0.004 (0.063)
Endline	0.080*** (0.019)	0.081*** (0.024)	0.099*** (0.017)	0.102*** (0.022)	0.066** (0.028)	0.062* (0.035)	0.069*** (0.023)	0.059* (0.031)	0.050 (0.043)	0.073 (0.053)	0.069* (0.036)	0.085** (0.043)
Constant	0.083*** (0.006)	0.078* (0.040)	0.099*** (0.014)	0.099* (0.051)	0.071*** (0.007)	0.022 (0.057)	0.047** (0.019)	0.001 (0.066)	0.082*** (0.012)	0.117* (0.067)	0.148*** (0.031)	0.195* (0.105)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.027	0.028	0.034	0.036	0.017	0.019	0.021	0.022	0.025	0.027	0.040	0.042
Obs.	3727	3727	2711	2711	1221	1221	903	903	903	903	605	605
villages	178	178	175	175	166	166	159	159	148	148	136	136

All columns here provide output of panel regressions on 's4aq13': "What type of seed/seedlings did you use for the crops you planted on this parcel? Traditional or Improved?" (If the respondent used improved seeds for any crops, not necessarily all, this was considered an affirmative response in this regression analysis.) Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 33: Amount paid for improved seeds

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	2.1e+06 (2.0e+06)	2.0e+06 (1.8e+06)			2.6e+04 (1.6e+04)	3.0e+04* (1.7e+04)			5.4e+04** (2.4e+04)	5.1e+04* (2.7e+04)		
DiD-treatment			-5.4e+06 (5.3e+06)	-5.0e+06 (5.0e+06)			8.5e+04** (3.5e+04)	8.8e+04** (3.6e+04)			5.2e+04 (9.5e+04)	5.0e+04 (9.3e+04)
Endline	7.7e+04*** (8157.151)	7.5e+05 (9.2e+05)	2.8e+06 (2.6e+06)	3.8e+06 (3.6e+06)	5.9e+04*** (9031.316)	4.5e+04*** (1.3e+04)	6.3e+04*** (8893.845)	6.5e+04*** (1.1e+04)	6.2e+04*** (1.2e+04)	5.8e+04** (2.8e+04)	7.7e+04*** (1.4e+04)	8.2e+04*** (2.4e+04)
Constant	-1.1e+04 (2.4e+05)	5.7e+06 (6.0e+06)	2.2e+06 (1.7e+06)	1.0e+07 (9.7e+06)	7743.235*** (1461.543)	-2.3e+04 (3.1e+04)	1.3e+04*** (3375.747)	1.8e+04 (4.0e+04)	2.1e+04*** (3181.616)	-2.6e+04 (4.1e+04)	2.8e+04** (1.1e+04)	-1.2e+04 (5.5e+04)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.003	0.011	0.014	0.022	0.255	0.260	0.375	0.379	0.113	0.126	0.104	0.144
Obs.	2760	2760	1981	1981	887	887	633	633	684	684	454	454
villages	178	178	175	175	165	165	158	158	148	148	135	135

All columns here provide output of panel regressions on 's4aq16': "How much did you pay (cash & in-kind payments) for all purchased seeds/seedlings used for this parcel?" All coefficient values are in Ugandan shillings (UGX). Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 34: Coffee planting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.032 (0.024)	-0.034 (0.024)			-0.017 (0.038)	-0.016 (0.040)			0.009 (0.037)	0.005 (0.036)		
DiD-treatment			-0.007 (0.034)	-0.007 (0.033)			-0.003 (0.060)	0.002 (0.060)			-0.007 (0.049)	-0.011 (0.051)
Endline	-0.084*** (0.016)	-0.070*** (0.021)	-0.104*** (0.017)	-0.094*** (0.022)	-0.085*** (0.026)	-0.080** (0.039)	-0.099*** (0.026)	-0.097** (0.037)	-0.048* (0.025)	-0.037 (0.037)	-0.030 (0.025)	-0.017 (0.045)
Constant	0.197*** (0.006)	0.241*** (0.041)	0.223*** (0.016)	0.263*** (0.048)	0.168*** (0.008)	0.200*** (0.072)	0.174*** (0.025)	0.205** (0.096)	0.126*** (0.008)	0.162** (0.069)	0.133*** (0.024)	0.183** (0.079)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.030	0.032	0.032	0.034	0.030	0.032	0.035	0.037	0.007	0.017	0.004	0.013
Obs.	3935	3934	2864	2864	1288	1288	950	950	959	959	649	649
villages	178	178	175	175	166	166	159	159	148	148	137	137

All columns here provide output of panel regressions on 's4aq06': "What were the main crops that you planted on this parcel in the last planting season?" Answers were coded as 1 if the crop was any variety of coffee and as 0 otherwise. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 35: Tree planting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.027* (0.014)	0.028** (0.014)			0.000 (0.024)	0.003 (0.023)			0.033 (0.024)	0.024 (0.022)		
DiD-treatment			0.007 (0.012)	0.007 (0.012)			-0.017 (0.021)	-0.019 (0.021)			-0.004 (0.023)	-0.010 (0.021)
Endline	-0.022* (0.012)	-0.030** (0.015)	-0.009 (0.009)	-0.012 (0.011)	-0.000 (0.019)	-0.009 (0.021)	0.002 (0.014)	-0.006 (0.019)	-0.019 (0.020)	0.003 (0.021)	0.004 (0.020)	0.033 (0.022)
Constant	0.034*** (0.003)	0.012 (0.018)	0.042*** (0.006)	0.041* (0.022)	0.029*** (0.005)	0.050** (0.024)	0.038*** (0.009)	0.058* (0.032)	0.027*** (0.005)	0.031 (0.029)	0.029*** (0.010)	0.078** (0.036)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.002	0.004	0.002	0.003	0.000	0.007	0.002	0.013	0.003	0.010	0.001	0.008
Obs.	4847	4845	3475	3475	1558	1558	1146	1146	1146	1146	750	750
villages	178	178	175	175	167	167	159	159	148	148	138	138

All columns here provide output of panel regressions on a composite variable that captured whether trees were planted as an investment on the given parcel: The survey items used were 's2aq11a', 's4aq06', and 'f59'. Answers were coded as 1 if trees were planted as an investment and 0 otherwise. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 36: Coffee or tree planting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.014 (0.025)	-0.013 (0.025)			-0.011 (0.039)	-0.007 (0.040)			0.010 (0.041)	-0.005 (0.038)		
DiD-treatment			-0.025 (0.031)	-0.025 (0.031)			-0.019 (0.049)	-0.020 (0.049)			-0.056 (0.044)	-0.068 (0.046)
Endline	-0.110*** (0.018)	-0.114*** (0.022)	-0.114*** (0.016)	-0.117*** (0.020)	-0.093*** (0.028)	-0.099*** (0.037)	-0.099*** (0.025)	-0.107*** (0.036)	-0.062** (0.030)	-0.030 (0.036)	-0.035 (0.031)	-0.009 (0.047)
Constant	0.210*** (0.006)	0.203*** (0.037)	0.233*** (0.012)	0.238*** (0.047)	0.179*** (0.009)	0.218*** (0.057)	0.183*** (0.019)	0.220*** (0.077)	0.143*** (0.010)	0.172*** (0.063)	0.162*** (0.024)	0.208*** (0.080)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.039	0.041	0.044	0.046	0.033	0.035	0.036	0.041	0.011	0.020	0.014	0.021
Obs.	4847	4845	3475	3475	1558	1558	1146	1146	1146	1146	750	750
villages	178	178	175	175	167	167	159	159	148	148	138	138

All columns here provide output of panel regressions on the sum of the 'coffee' and 'trees' indicators described above. Answers were coded as 1 if either coffee or trees were planted or situated on the parcel in the last planting season and as 0 otherwise. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 37: Value of already-sold crops this season

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	1.2e+04 (1.9e+04)	1.2e+04 (1.9e+04)			2.5e+04 (1.6e+04)	2.4e+04 (1.6e+04)			3.9e+04 (2.4e+04)	3.6e+04 (2.2e+04)		
DiD-treatment			-1.3e+05 (1.2e+05)	-1.3e+05 (1.2e+05)			2.4e+04 (1.0e+05)	2.9e+04 (1.0e+05)			-3.2e+05 (3.7e+05)	-3.0e+05 (3.7e+05)
Endline	-6.4e+04*** (1.0e+04)	-7.1e+04*** (1.2e+04)	-2.9e+05*** (8.3e+04)	-3.0e+05*** (1.0e+05)	-4.7e+04*** (1.5e+04)	-4.8e+04*** (1.7e+04)	-1.9e+05*** (6.6e+04)	-1.7e+05** (8.2e+04)	-7.2e+04*** (2.0e+04)	-7.0e+04*** (2.2e+04)	-2.0e+05** (9.3e+04)	-1.7e+05 (1.3e+05)
Constant	1.1e+05*** (5064.528)	5.6e+04* (3.1e+04)	5.8e+05*** (5.2e+04)	4.1e+05** (1.8e+05)	6.6e+04*** (3852.560)	6.0e+04*** (1.7e+04)	3.4e+05*** (4.1e+04)	4.9e+05*** (1.1e+05)	1.2e+05*** (5724.334)	9.6e+04*** (4.0e+04)	7.0e+05*** (1.2e+05)	6.0e+05** (2.4e+05)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.002	0.002	0.010	0.011	0.002	0.002	0.015	0.017	0.003	0.003	0.019	0.022
Obs.	25344	25328	3630	3630	8848	8848	1196	1196	5984	5984	786	786
villages	178	178	175	175	167	167	159	159	150	150	138	138

All columns here provide output of panel regressions on "s5aq08_1": "How much did you receive for the crop sale [for crops on this parcel this season]?". Coefficient values are shown in Ugandan shillings (UGX). Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 38: Dwelling quality: PCA index

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.044 (0.087)	0.037 (0.087)			0.086 (0.131)	0.067 (0.130)			-0.146 (0.160)	-0.121 (0.158)		
DiD-treatment			-0.117 (0.078)	-0.123 (0.078)			-0.029 (0.135)	-0.025 (0.133)			-0.517*** (0.141)	-0.502*** (0.143)
Endline	0.004 (0.065)	0.025 (0.069)	0.063 (0.050)	0.084 (0.055)	-0.059 (0.101)	0.000 (0.116)	-0.002 (0.074)	0.048 (0.090)	0.286** (0.131)	0.257* (0.142)	0.341*** (0.094)	0.328*** (0.109)
Constant	0.001 (0.021)	-0.047 (0.093)	0.001 (0.021)	-0.043 (0.093)	0.062* (0.032)	0.006 (0.171)	0.062* (0.032)	0.014 (0.171)	-0.514*** (0.039)	-0.387* (0.215)	-0.514*** (0.039)	-0.398* (0.214)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.001	0.003	0.002	0.004	0.001	0.009	0.000	0.009	0.019	0.024	0.041	0.045
Obs.	3165	3163	3165	3163	1105	1105	1105	1105	748	748	748	748
villages	178	178	178	178	167	167	167	167	150	150	150	150

All columns here provide output of panel regressions on an index of dwelling quality constructed using principal component analysis (PCA). The index included variables for building materials, number of rooms, and electricity. Coefficient values are shown in arbitrary units with higher values indicating higher dwelling quality. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 40: Years parcel has been fallow in past 7 years

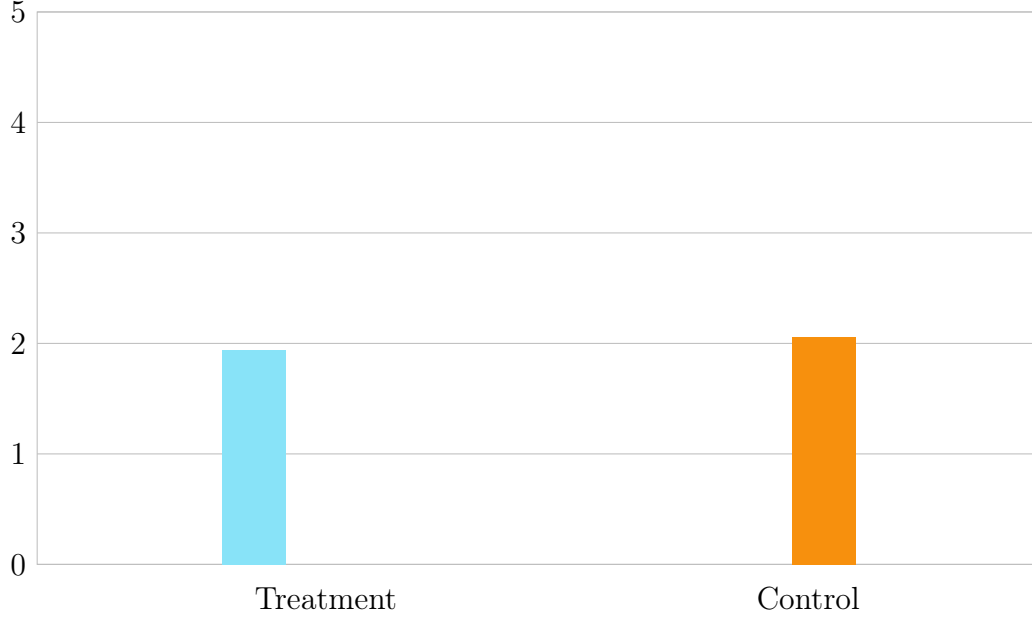


Table 39: Total expected value of crops sold this season

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-2.5e+04 (3.0e+04)	-2.4e+04 (3.0e+04)			2.1e+04 (1.6e+04)	2.0e+04 (1.6e+04)			3.2e+04 (2.6e+04)	2.7e+04 (2.4e+04)		
DiD-treatment			-2.1e+05 (1.4e+05)	-2.1e+05 (1.4e+05)			-4.5e+03 (1.1e+05)	485.167 (1.1e+05)			-3.8e+05 (3.7e+05)	-3.6e+05 (3.7e+05)
Endline	-7.1e+04*** (1.0e+04)	-8.7e+04*** (1.4e+04)	-4.6e+05*** (1.4e+05)	-5.1e+05** (2.0e+05)	-5.2e+04*** (1.5e+04)	-5.3e+04*** (1.8e+04)	-2.3e+05*** (6.4e+04)	-2.1e+05*** (7.7e+04)	-7.5e+04*** (2.0e+04)	-6.9e+04*** (2.2e+04)	-2.6e+05*** (9.5e+04)	-2.0e+05 (1.3e+05)
Constant	1.4e+05*** (8783.268)	4.7e+04 (3.9e+04)	7.4e+05*** (7.9e+04)	3.8e+05 (2.4e+05)	7.4e+04*** (3711.193)	7.7e+04*** (1.9e+04)	3.9e+05*** (4.1e+04)	5.9e+05*** (1.2e+05)	1.4e+05*** (6478.970)	1.1e+05*** (4.1e+04)	7.7e+05*** (1.2e+05)	7.4e+05*** (2.4e+05)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.001	0.002	0.008	0.010	0.003	0.003	0.022	0.027	0.003	0.003	0.023	0.026
Obs.	25344	25328	3630	3630	8848	8848	1196	1196	5984	5984	786	786
villages	178	178	175	175	167	167	159	159	150	150	138	138

All columns here provide output of panel regressions on the sum of `ssacq08_1_1` "How much did you receive for the crop sale [for crops on this parcel this season]?" and `ssacq08_1_a` "What is the total value expected from the future sale [for crops on this parcel this season]?". Coefficient values are shown in Ugandan shillings (UGX). Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

13 Findings-Credit and Loans

Figure 41: Summary of Credit and Loans Findings

Summary of Credit Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH
Credit and loans	Partial improvement	Mixed	No change
REGRESSION INDICATORS			
Source of borrowing - SACCOS	Weak (only ILGU beneficiaries)	Only ILGU beneficiaries	No change
Source of borrowing - VSLA	No change	Weak only ILGU beneficiaries	
Source of borrowing - microfinance	No change	No change	
Source of borrowing - bank	No change	No change	

Overall, there is a fair amount of loan taking in the study area. Approximately 39 percent of survey respondents report that they have taken out a loan (formal or informal) in the last 12 months.

We tested an overall indicator for credit-taking indicators for evidence of an uptick in informal credit taking. Descriptively, households in the treatment area are slightly more likely (6 percentage points) to have taken out a loan in the past 12 months. However, the panel regression analysis shows null effects for both loan taking and the size of loans, among those who took a loan.

However, in addition to the overall indicator for credit and loan taking, we ran regression analysis for each potential source of borrowing: bank, Village Savings and Loans Associations (VSLAs), Saving and Credit Cooperative Organizations (SACCOS), and micro-finance institutions. There were null treatment effects for banks and micro-finance institutions. In contrast, there was evidence of positive treatment effects for direct ILGU beneficiaries for borrowing from SACCOS. This treatment effect is approximately 2.5 percentage points and weakly significant for the aggregate sample. Importantly, for female-headed households, there are larger and more statistically significant effects of approximately 5.7 percentage points, although there is a corresponding decline (approximately 8 percentage points and weakly significant) in borrowing from VSLAs among the female-headed households.

Table 40: HH has taken out loan from SACCOS in past 12 months: Y/N

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.020 (0.013)	0.021 (0.013)			-0.003 (0.017)	-0.004 (0.017)			0.041 (0.028)	0.046 (0.028)		
DiD-treatment			0.025* (0.015)	0.026* (0.015)			0.057** (0.027)	0.058** (0.027)			0.044 (0.034)	0.049 (0.034)
Endline	0.022** (0.009)	0.019* (0.011)	0.027*** (0.007)	0.025*** (0.009)	0.025* (0.013)	0.031** (0.015)	0.010 (0.008)	0.015 (0.011)	0.028 (0.020)	0.020 (0.024)	0.041** (0.017)	0.036 (0.025)
Constant	0.018*** (0.003)	0.024 (0.016)	0.018*** (0.003)	0.026 (0.016)	0.013*** (0.004)	0.018 (0.027)	0.013*** (0.004)	0.017 (0.027)	0.011 (0.007)	0.024 (0.046)	0.011 (0.007)	0.027 (0.047)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.020	0.022	0.020	0.022	0.013	0.015	0.028	0.029	0.043	0.047	0.043	0.047
Obs.	3172	3170	3172	3170	1108	1108	1108	1108	752	752	752	752
villages	178	178	178	178	167	167	167	167	150	150	150	150

All columns here provide output of panel regressions on 's7q8': "During the past 12 months, has any member of your household (alone or jointly with members or nonmembers of the household) applied for a loan (in cash or in-kind) or asked to borrow money from this source?" - Answer: "SACCOS". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

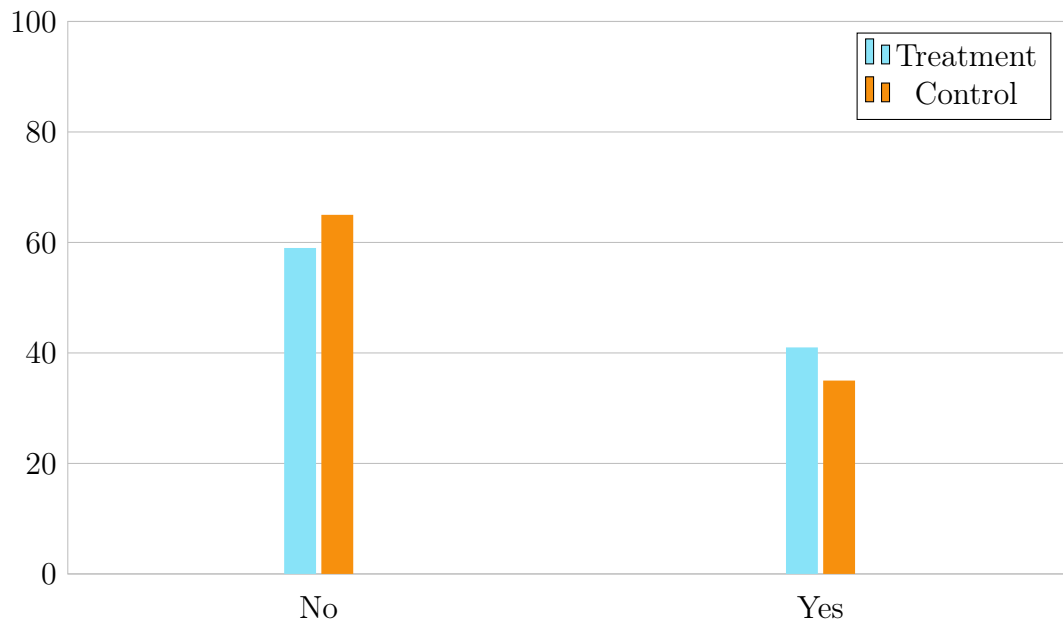
Table 41: HH has taken out loan from VSLA in past 12 months: Y/N

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.003 (0.021)	-0.003 (0.021)			-0.053 (0.032)	-0.050 (0.033)			0.012 (0.037)	0.017 (0.037)		
DiD-treatment			0.007 (0.024)	0.006 (0.024)			-0.083* (0.046)	-0.082* (0.046)			0.049 (0.051)	0.054 (0.050)
Endline	-0.019 (0.013)	-0.022 (0.015)	-0.023* (0.012)	-0.026** (0.013)	-0.033* (0.020)	-0.040 (0.025)	-0.043** (0.017)	-0.051** (0.021)	0.014 (0.028)	-0.028 (0.033)	0.007 (0.024)	-0.033 (0.030)
Constant	0.077*** (0.005)	0.054** (0.027)	0.077*** (0.005)	0.054** (0.027)	0.103*** (0.008)	0.093* (0.049)	0.103*** (0.009)	0.086* (0.049)	0.064*** (0.009)	-0.032 (0.059)	0.064*** (0.009)	-0.031 (0.060)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.004	0.004	0.004	0.005	0.035	0.038	0.040	0.043	0.004	0.012	0.007	0.016
Obs.	3172	3170	3172	3170	1108	1108	1108	1108	752	752	752	752
villages	178	178	178	178	167	167	167	167	150	150	150	150

All columns here provide output of panel regressions on 's7q8': "During the past 12 months, has any member of your household (alone or jointly with members or nonmembers of the household) applied for a loan (in cash or in-kind) or asked to borrow money from this source?" - Answer: "Cooperatives/village savings and loan associations (VSLA)". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 42: Took a loan in the last 12 months



14 Findings-Rentals and Land Markets

Figure 43: Summary of Rentals and Land Markets Findings

Summary of Rentals and Land Markets Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH	TENANTS RELATED TO THE LANDLORD
Rental and land markets	Partial improvement	No change	Partial improvement	Partial improvement
REGRESSION INDICATORS				
Non-agricultural land sales	Weak (only ILGU beneficiaries)	No change	No change	No change
Estimated sale value of primary parcel	No change	No change	Weak (only ILGU beneficiaries)	No change
Size of landholdings	No change	No change	No change	No change
Parcel rentals	No change	No change	No change	No change
Land purchased under mailo tenancy	No change	No change	No change	No change
Willingness to buy mailo parcels	No change	No change	No change	Weak (only ILGU beneficiaries)

Only 4 percent (100) of respondents report that they rented out the parcel during the 2022/2023 cropping season. Across the full treatment area, this is 5 percent (42) of control and 4 percent (58) of treatment respondents. Among those who were directly mapped by ILGU, this is 4 percent (52) of control and 3 percent (15) of treatment respondents.

Respondents were asked a series of questions about land values and willingness to pay to own their parcel. The descriptive statistics show that treatment respondents expect higher sales and rental values for their property. For a series of questions about willingness to pay if a landlord agreed to sell a parcel, 69 percent of treatment versus 62 percent of control respondents reported that they would be willing to pay to own their property. However, among those who would be willing to pay to own the parcel, 41 percent of treatment and 42 percent of control respondents report that they would not pay at any price greater than 2.1 million UGX, and there is no difference between treatment and control respondents at

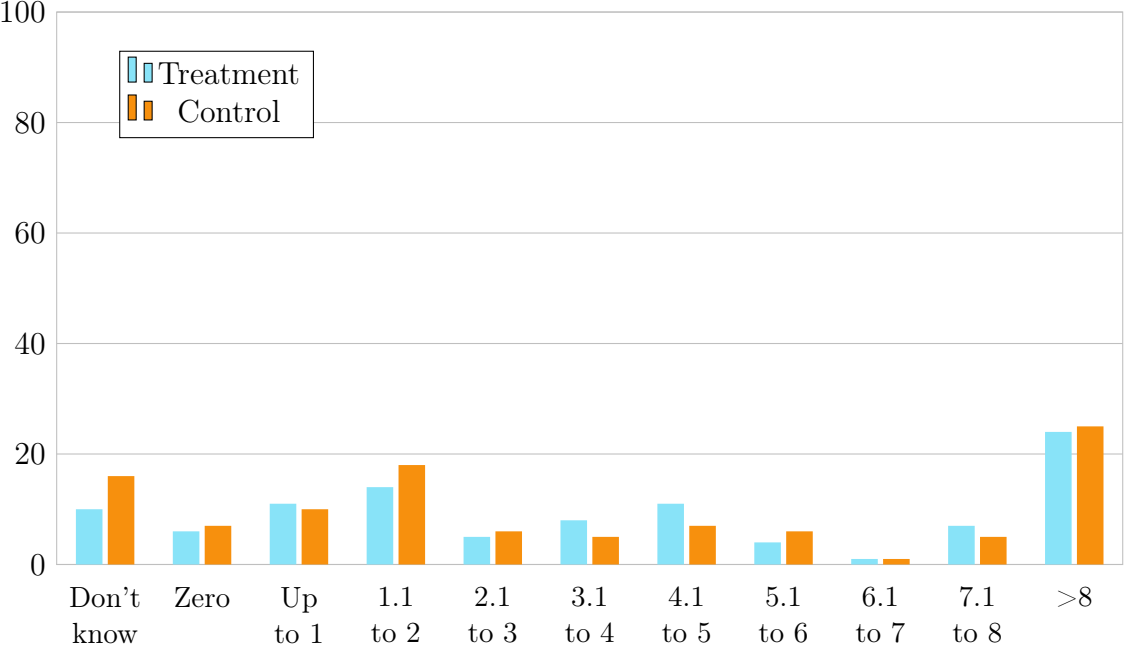
different higher price points such as 7.1 to 8 million or 6.1 to 7 million.

Forty-three percent of landlords would be willing to sell a parcel to a kibanja holder or squatter if the price was acceptable. However, the price at which a landlord would agree to sell is generally high. The median acceptable price is 5 million UGX. Only 24 percent of landlords willing to sell a parcel would accept a price of 2 million UGX or lower. In the last five years, 20 percent of landlords have sold or transferred land that is under Mailo tenancy, though none indicated that the ILGU mapping and land dispute resolution influenced this decision.

Respondents were asked their willingness to pay the landlord to become the legal owner of the two-acre parcels with a land title and full ownership rights. There is not a significant difference between ILGU and non-ILGU beneficiaries.

Among ILGU beneficiaries, Figure 44 below shows that 10 percent would not pay any amount for the land, 6 percent were not able to determine how much they would pay, 11 percent would pay up to 1 million, and 14 percent up to 2 million. On the other hand, 24 percent would pay more than 8 million. This means that there is a bit of polarity between those willing to pay 0 to 2 million (35 percent) versus those willing to pay 8+ million (24 percent). This pulls the average up to 8 million while the median is 4 million.

Figure 44: Willingness to pay (in Millions of UGX) for 2 acre - title with full rights [ILGU-beneficiaries]

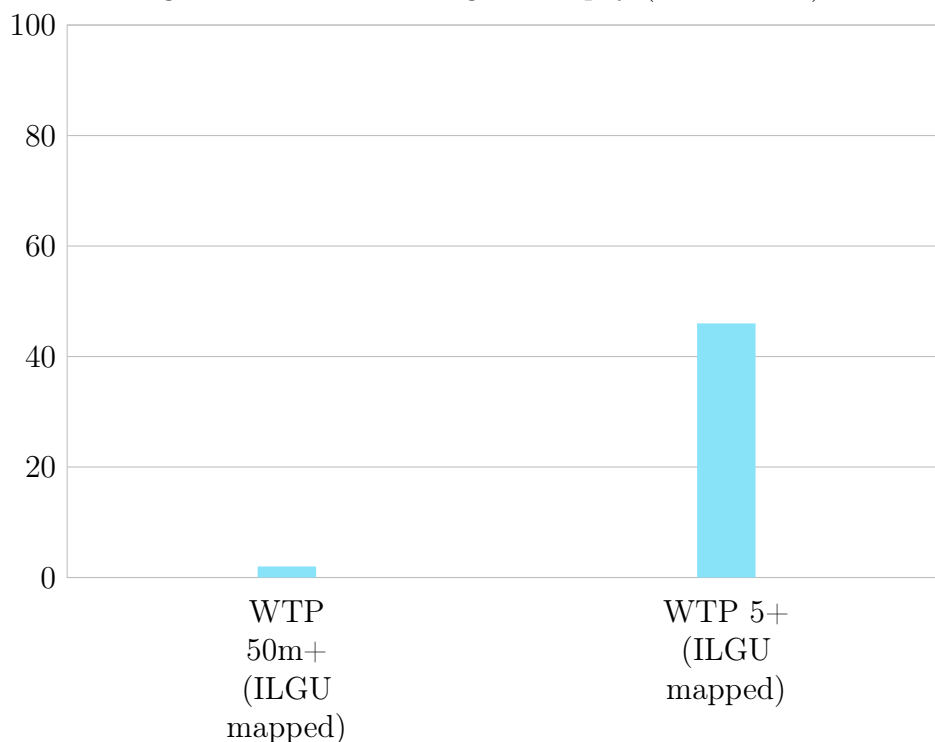


Among those who provided a price estimate, the average amount that ILGU beneficiaries would be willing to pay for a two-acre parcel is approximately 7.5 million UGX. The median

amount is 4 million. Those not mapped by ILGU would be willing to pay approximately 8 million with a median of 4 million.

In terms of comparing this to the average willingness to sell landlord responses, only eight ILGU beneficiaries would pay 50 million or more for the two-acre parcel. On the other hand, 46 percent (N=162) of ILGU beneficiaries would pay 5 million UGX or more for a two-acre parcel with a title and full ownership rights.

Figure 45: Tenant willingness to pay (2 acre, title)



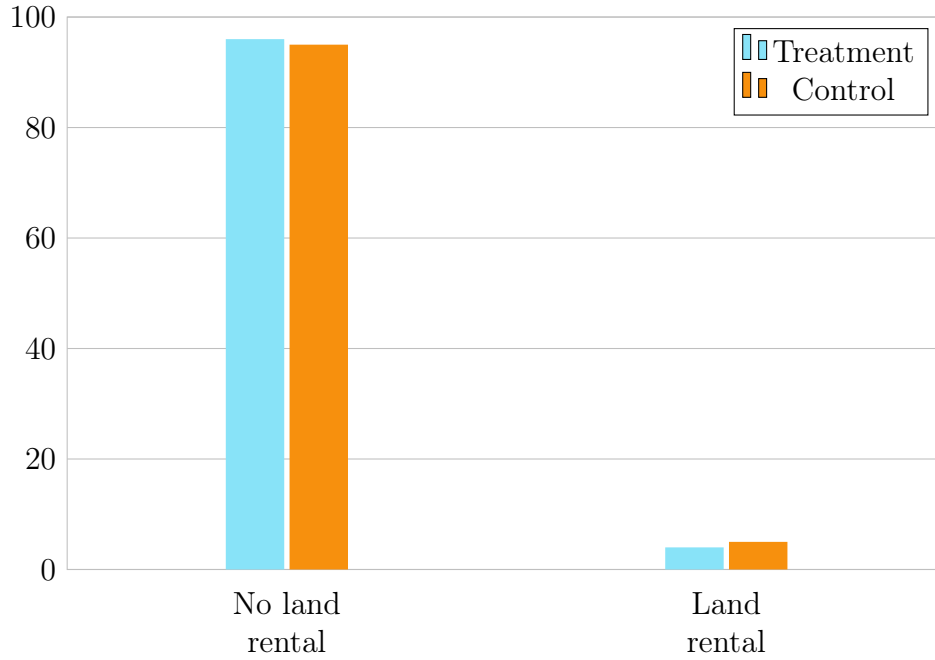
14.1 Regression Analysis

There is limited evidence of treatment effects on the size of landholdings, purchases of Mailo land, willingness to buy Mailo parcels, or in parcel rentals.

For the willingness to pay indicator, tenants who are related to landlords are 24.3 to 25.8 percentage points much more likely to report that they would pay the landlord to own the parcel, although weakly significant.

There is also some weak evidence of non-agricultural land sales over the past five years. Direct program beneficiaries are approximately 3 percentage points more likely to report that they sold non-agricultural land. These results seem to be driven by women in the treatment area who are 3.7 to 4 percentage points more likely than their control counterparts to have

Figure 46: Land Rentals



sold non-agricultural land, although this finding is weakly significant and does not hold for direct program beneficiaries.

There is little evidence of a treatment effect for perceptions of land values, although there is weakly significant evidence that direct youth program beneficiaries have higher estimated sale values for their primary parcels.

Table 42: Non-agricultural land sales

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
Treatment area	0.010 (0.016)	0.010 (0.016)			0.037* (0.021)	0.040* (0.021)			0.001 (0.024)	0.006 (0.024)		
Treated			0.032* (0.017)	0.031* (0.017)			0.039 (0.027)	0.041 (0.027)			0.044 (0.028)	0.042 (0.027)
Constant	0.078*** (0.012)	0.080*** (0.027)	0.075*** (0.009)	0.078*** (0.025)	0.046*** (0.014)	0.019 (0.027)	0.058*** (0.012)	0.038 (0.027)	0.078*** (0.019)	0.026 (0.052)	0.067*** (0.013)	0.022 (0.048)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.000	0.003	0.003	0.005	0.005	0.011	0.004	0.009	0.000	0.007	0.005	0.011
Obs.	1577	1576	1577	1576	548	548	548	548	433	433	433	433
villages	178	178	178	178	167	167	167	167	155	155	155	155

All columns here provide output of endline cross-sectional regressions on "L01: "Has your household sold any non-agricultural land during the past 5 years?". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 43: Tenant willingness to buy mailo parcels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.007 (0.037)	0.008 (0.037)			0.045 (0.062)	0.049 (0.062)			-0.061 (0.070)	-0.044 (0.071)		
DiD-treatment			0.000 (0.035)	-0.000 (0.035)			-0.002 (0.060)	-0.001 (0.060)			-0.039 (0.073)	-0.027 (0.076)
Endline	-0.009 (0.027)	-0.039 (0.032)	-0.005 (0.022)	-0.034 (0.028)	-0.056 (0.048)	-0.091 (0.056)	-0.029 (0.035)	-0.059 (0.044)	0.095* (0.055)	0.018 (0.072)	0.069 (0.045)	-0.003 (0.066)
Constant	0.724*** (0.009)	0.608*** (0.056)	0.724*** (0.009)	0.609*** (0.056)	0.704*** (0.014)	0.563*** (0.093)	0.704*** (0.015)	0.568*** (0.093)	0.708*** (0.017)	0.600*** (0.096)	0.708*** (0.017)	0.597*** (0.097)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.000	0.003	0.000	0.003	0.003	0.009	0.002	0.007	0.011	0.020	0.010	0.019
Obs.	2964	2962	2964	2962	1021	1021	1021	1021	702	702	702	702
villages	178	178	178	178	166	166	166	166	149	149	149	149

All columns here provide output of panel regressions on 'pay_parcel': "Let's assume the landlord agreed to sell one of your parcels under mailo tenancy to your household. Would your household be willing to pay the landlord to own this parcel?". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 44: Estimated sale value of primary parcel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	4.1e+06 (5.0e+06)	5.0e+06 (4.9e+06)			6.7e+06 (7.9e+06)	1.0e+07 (8.1e+06)			6.4e+06 (6.3e+06)	4.8e+06 (5.8e+06)		
DiD-treatment			1.0e+06 (5.0e+06)	9.7e+05 (4.9e+06)			-2.3e+06 (6.6e+06)	-1.6e+06 (6.7e+06)			1.8e+07* (9.4e+06)	1.7e+07* (8.6e+06)
Endline	2.4e+07*** (3.9e+06)	1.9e+07*** (4.2e+06)	2.6e+07*** (3.3e+06)	2.2e+07*** (3.9e+06)	1.9e+07*** (5.6e+06)	8.5e+06 (6.6e+06)	2.4e+07*** (5.4e+06)	1.6e+07** (6.6e+06)	1.2e+07*** (2.9e+06)	1.4e+07*** (3.9e+06)	9.9e+06*** (2.5e+06)	1.1e+07*** (3.4e+06)
Constant	1.1e+07*** (1.0e+06)	-7.5e+06 (8.8e+06)	1.1e+07*** (1.0e+06)	-6.8e+06 (8.8e+06)	1.0e+07*** (1.6e+06)	-1.4e+07 (1.4e+07)	1.0e+07*** (1.6e+06)	-1.1e+07 (1.4e+07)	6.8e+06*** (1.6e+06)	1.6e+06 (9.7e+06)	6.9e+06*** (1.6e+06)	2.7e+06 (9.7e+06)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.115	0.121	0.114	0.120	0.112	0.126	0.110	0.122	0.087	0.098	0.108	0.116
Obs.	2408	2406	2408	2406	804	804	804	804	559	559	559	559
villages	178	178	178	178	166	166	166	166	138	138	138	138

All columns here provide output of panel regressions on 'sq17': "If you were to sell this land today, how much do you think you could sell it for?". Coefficient values are shown in Ugandan shillings (UGX). Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

15 Findings-Livelihoods

Figure 47: Summary of Livelihoods Findings

Summary of Livelihoods Findings

OUTCOME	EVALUATION FINDING	WOMEN	YOUTH
Livelihoods	No change	Partial improvement	Improvement
REGRESSION INDICATORS			
Asset index	No change	Weak (only ILGU beneficiaries)	No change
Off-farm income		No change	No change
Basic necessities (shoes, blankets, clothes)		No change	Weak (only ILGU beneficiaries)
Food security		No change	

15.1 Regression Analysis

The regression analysis of livelihood indicators tells a mostly mixed story. There are null effects for aggregate asset improvements, engagement in wage labor, and annual income from wage labor.

However, in terms of positive effects, there is weak evidence among female direct beneficiaries of increased wealth as measured by an asset index. For household necessities and food security indicators, there are relatively small but consistently positive treatment effects that are centered on youth-headed households. Youth-headed households in the treatment area are more likely to have shoes and less likely to have experienced food insecurity in the past year.

In contrast to these positive results, direct treatment respondents are about 7.5 percentage points less likely to report the ownership of non-farming enterprises-and the full treatment sample (although not direct program beneficiaries) are significantly and substantively (9 percentage points) less likely to have a bank account. Additional exploration of why we see these negative treatment effects is necessary. The matched sample might provide additional insights into these findings.

Table 45: Asset wealth: PCA index

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.278 (0.209)	-0.301 (0.222)			0.163 (0.125)	0.166 (0.122)			-0.632 (0.702)	-0.757 (0.811)		
DiD-treatment			0.253 (0.171)	0.248 (0.177)			0.220* (0.132)	0.226* (0.135)			0.870 (0.620)	0.975 (0.703)
Endline	0.617*** (0.103)	0.711*** (0.161)	0.380** (0.159)	0.448*** (0.120)	0.397*** (0.100)	0.405*** (0.100)	0.436*** (0.068)	0.453*** (0.078)	0.402*** (0.049)	0.985 (0.647)	-0.238 (0.607)	0.168 (0.201)
Constant	0.327*** (0.058)	0.216 (0.321)	0.327*** (0.058)	0.186 (0.308)	0.130*** (0.030)	0.114 (0.257)	0.130*** (0.030)	0.134 (0.259)	0.471** (0.217)	0.978 (0.954)	0.471** (0.218)	0.950 (0.912)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.011	0.017	0.010	0.016	0.122	0.125	0.123	0.126	0.001	0.016	0.002	0.017
Obs.	3134	3132	3134	3132	1092	1092	1092	1092	743	743	743	743
villages	178	178	178	178	167	167	167	167	150	150	150	150

All columns here provide output of panel regressions on an index of asset constructed using principal component analysis (PCA). The index included variables for value and quantity of items possessed by the HH, such as a dwelling, non-agricultural land, motor vehicles, computers, appliances, and other durable goods. Coefficient values are shown in arbitrary units with higher values indicating more asset wealth. Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 46: Do all HH members have shoes: Y/N

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	0.028 (0.027)	0.021 (0.027)			0.054 (0.050)	0.043 (0.049)			0.086* (0.052)	0.071 (0.052)		
DiD-treatment			0.014 (0.027)	0.011 (0.027)			0.035 (0.055)	0.039 (0.054)			0.089* (0.050)	0.081* (0.048)
Endline	0.082*** (0.023)	0.121*** (0.027)	0.095*** (0.015)	0.132*** (0.021)	0.083** (0.039)	0.133*** (0.043)	0.105*** (0.029)	0.151*** (0.038)	0.035 (0.045)	0.128** (0.054)	0.063** (0.029)	0.152*** (0.042)
Constant	0.764*** (0.006)	0.850*** (0.039)	0.764*** (0.006)	0.852*** (0.039)	0.714*** (0.013)	0.785*** (0.067)	0.714*** (0.013)	0.791*** (0.068)	0.775*** (0.012)	0.954*** (0.071)	0.775*** (0.012)	0.959*** (0.071)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R ²	0.036	0.042	0.035	0.041	0.041	0.050	0.039	0.050	0.036	0.054	0.035	0.054
Obs.	3164	3162	3164	3162	1106	1106	1106	1106	748	748	748	748
villages	178	178	178	178	167	167	167	167	150	150	150	150

All columns here provide output of panel regressions on 's12q4': "Does every member of the household have at least one pair of shoes?". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 47: Food shortage in HH in last 12 months: Y/N

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT	ITT	ITT	ATT	ATT
DiD-geography	-0.060 (0.038)	-0.050 (0.038)			-0.025 (0.059)	-0.008 (0.058)			-0.150** (0.072)	-0.140* (0.072)		
DiD-treatment			-0.060 (0.044)	-0.056 (0.043)			-0.007 (0.067)	-0.009 (0.065)			-0.157* (0.086)	-0.146* (0.088)
Endline	0.292*** (0.027)	0.235*** (0.032)	0.273*** (0.021)	0.219*** (0.027)	0.271*** (0.043)	0.176*** (0.053)	0.258*** (0.035)	0.174*** (0.043)	0.406*** (0.058)	0.357*** (0.070)	0.357*** (0.040)	0.306*** (0.056)
Constant	0.223*** (0.010)	0.081* (0.047)	0.223*** (0.010)	0.077 (0.047)	0.268*** (0.015)	-0.006 (0.086)	0.268*** (0.015)	-0.007 (0.085)	0.168*** (0.017)	0.084 (0.103)	0.168*** (0.018)	0.075 (0.102)
Covariates		X		X		X		X		X		X
HH-head subset	All	All	All	All	Women	Women	Women	Women	Young	Young	Young	Young
R^2	0.148	0.154	0.147	0.154	0.141	0.160	0.140	0.160	0.221	0.225	0.220	0.225
Obs.	3167	3165	3167	3165	1106	1106	1106	1106	748	748	748	748
villages	178	178	178	178	167	167	167	167	150	150	150	150

All columns here provide output of panel regressions on 's12q8': "Have you been faced with a situation when you did not have enough food to feed the household in the last 12 months?". Columns 1-4 include all surveyed HHs, columns 5-8 include only female-headed HHs, and columns 9-12 include only HHs with heads under age 35. Regressions include the following covariates where indicated: female-headed HH flag, HH head from village flag, HH size, flag if HH head can write, flag if HH member has held notable office. Columns 1, 2, 5, 6, 9, and 10 identify the intent-to-treat effect; columns 3, 4, 7, 8, 11, and 12 identify the treatment effect on the treated. All regressions here include HH and time fixed effects. All regressions here use robust standard errors clustered by village.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

16 Conclusion

Overall, direct ILGU beneficiaries are more likely to report ownership or use-rights documentation for their parcels and more likely to be aware of COOs. There is also an aggregate positive treatment effect on seeking and acquiring a COO. Among direct beneficiaries, ILGU beneficiaries are significantly more likely to have ever paid the busuulu, although there are no changes in terms of frequency and amount of busuulu payments.

With the exception of knowledge and awareness of COO, there is no evidence of ILGU effects understanding of land rights associated with various forms of documentation. This could be an area for future program focus. On the other hand, for endline indicators of perceived land rights, there is evidence of improved perceptions of land rights among ILGU beneficiaries. There is also some evidence of positive ILGU treatment impacts on perceived risk of losing land rights due to fallowing—these effects are centered on the aggregate sample and youth.

Significantly, there is evidence of lower reports of wrongful evictions in ILGU communities, along with fewer reports of the area of land expropriated. Correspondingly, the panel regression results indicate that ILGU has reduced conflict in the study area, including reductions in conflict occurrence and reductions in the perceived likelihood of conflict. These important effects are evident across the aggregate sample, female-headed households, and youth-headed households.

There is some weak evidence of higher perceived land and rental values for land in the treatment area, as well as weak evidence of non-agricultural land sales over the past five years. However, despite positive ILGU effects for a number of key indicators, there is no clear evidence of treatment effects on the size of landholdings, purchases of Mailo land, willingness to buy Mailo parcels, or in parcel rentals.

We also do not find clear investment, productivity, and livelihood effects. On average, there is mixed evidence of treatment effects for livelihoods indicators, including durable assets, engagement in wage labor, annual income from wage labor, and ownership of non-farming enterprises and having a bank account. Although, as discussed below, there is some evidence of improved livelihood effects for women and youth.

As described below, for priority outcomes, the evaluation finds a number of subgroup effects for women and youth.

16.1 Youth

ILGU has had a positive effect on youth awareness and knowledge of COOs. Youth are significantly more likely to have paid busuulu than their comparison counterparts, although

there are no significant differences in the frequency and amount of busuulu payments.

ILGU youth beneficiaries are significantly more likely than their control counterparts to report land rights associated with ownership, inheritance, and the right to sell. Moreover, there is some weak evidence that youth-headed households report a reduced risk of losing rights due to fallowing. Significantly, young ILGU beneficiaries are less likely to have experienced land expropriation than their comparison counterparts. Although actual conflict occurrence is not different for youth-headed beneficiaries, they are less likely to perceive the potential for a future dispute than their comparison counterparts.

Finally, there is evidence of a limited program impact for youth on land markets and livelihoods. Direct youth program beneficiaries have higher estimated sale values for their primary parcels, and although the team does not find investment impacts, there is also some evidence of positive impacts for youth on food security and asset indicators.

16.2 Women

ILGU has had a substantively large impact on women's access to documentation. Female-headed households are significantly more likely than their control counterparts to report having paid a busuulu, although the team does not find evidence in the frequency and amount of busuulu payments. Among women, there is some weak evidence of positive ILGU impacts on perceived tenure security. The study also finds that women are more likely to engage in credit-taking from SACCOS, although borrowing from VSLAs decreases.

Importantly, ILGU female beneficiaries are less likely to have experienced a conflict in the last five years and less likely to report wrongful evictions. They are significantly more likely than their control counterparts to report land rights associated with ownership, inheritance, and the right to sell.

Although not a robust finding, there is evidence that women in the treatment area are slightly more likely than their control counterparts to have sold non-agricultural land in the past five years. Finally, there is also weak evidence among female direct beneficiaries of increased wealth as measured by an asset index.

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A Summary Statistics

Uganda Mailo Endline Survey

Summary aggregated by geographic treatment status

Item	Control geography					Treatment geography				
	N	Mean	St.Dev	Min	Max	N	Mean	St.Dev	Min	Max
General covariates and indicators										
Parcel mapped by GIZ	549	0.062	0.241	0	1	1,107	0.467	0.499	0	1
Sex of HH member: Female	3,950	0.456	0.498	0	1	5,487	0.436	0.496	0	1
Sex of HH head: Female	636	0.377	0.485	0	1	951	0.331	0.471	0	1
HH head born in village (among respondents)	130	0.577	0.496	0	1	177	0.52	0.501	0	1
HH head born in village (all HHs)	503	0.515	0.5	0	1	769	0.551	0.498	0	1
Number of HH members	637	7.212	3.496	1	27	951	6.801	3.327	1	27
Relationship to HH head: Self	3,949	0.003	0.053	0	1	5,488	0.003	0.054	0	1
Relationship to HH head: Spouse	3,949	0.116	0.32	0	1	5,488	0.128	0.335	0	1
Relationship to HH head: Child	3,949	0.54	0.498	0	1	5,488	0.563	0.496	0	1
Relationship to HH head: Grandchild	3,949	0.258	0.438	0	1	5,488	0.23	0.421	0	1
Relationship to HH head: Parent	3,949	0.006	0.076	0	1	5,488	0.005	0.071	0	1
Relationship to HH head: Sibling	3,949	0.021	0.143	0	1	5,488	0.022	0.145	0	1
Relationship to HH head: Child of sibling	3,949	0.016	0.126	0	1	5,488	0.015	0.123	0	1
Relationship to HH head: Other	3,949	0.023	0.15	0	1	5,488	0.018	0.132	0	1
Relationship to HH head: Not related	3,949	0.017	0.128	0	1	5,488	0.016	0.124	0	1
HH member can read	2,903	0.711	0.454	0	1	4,143	0.709	0.454	0	1
HH member has attended formal schooling	2,900	0.872	0.334	0	1	4,147	0.863	0.344	0	1
Respondent is related to landlord	340	0.347	0.477	0	1	744	0.292	0.455	0	1
Landlord or kibanja holder: Landlord	637	0.113	0.317	0	1	951	0.102	0.303	0	1
Landlord or kibanja holder: Kibanja holder	637	0.716	0.451	0	1	951	0.782	0.413	0	1
Documentation										
Landlord or kibanja holder: Neither	637	0.171	0.377	0	1	951	0.116	0.32	0	1
HH has formal rights document for dwelling parcel	496	0.627	0.484	0	1	803	0.594	0.491	0	1
Name listed on formal rights document: None	311	0.309	0.463	0	1	477	0.199	0.4	0	1
Name listed on formal rights document: Member 1	311	0.646	0.479	0	1	477	0.765	0.424	0	1
Name listed on formal rights document: Member 2	311	0.08	0.272	0	1	477	0.088	0.284	0	1
Name listed on formal rights document: Member 3	311	0.01	0.098	0	1	477	0.013	0.112	0	1
Name listed on formal rights document: Member 4	311	0	0	0	0	477	0.008	0.091	0	1
Name listed on formal rights document: Member 5	311	0.006	0.08	0	1	477	0.008	0.091	0	1
Name listed on formal rights document: Member 6	311	0.006	0.08	0	1	477	0.013	0.112	0	1
Name listed on formal rights document: Member 7	311	0	0	0	0	477	0.002	0.046	0	1
Name listed on formal rights document: Member 8	311	0.003	0.057	0	1	477	0.006	0.079	0	1
Name listed on formal rights document: Member 9	311	0	0	0	0	477	0.002	0.046	0	1
Name listed on formal rights document: Member 10	311	0	0	0	0	477	0	0	0	0
Name listed on formal rights document: Member 11	311	0	0	0	0	477	0	0	0	0
Name listed on formal rights document: Member 12	311	0	0	0	0	477	0.002	0.046	0	1
Name listed on formal rights document: Member 13	311	0	0	0	0	477	0	0	0	0
Name listed on formal rights document: Member 14	311	0	0	0	0	477	0	0	0	0
Name listed on formal rights document: Member 15	311	0	0	0	0	477	0	0	0	0
Name listed on formal rights document: Member 16	311	0	0	0	0	477	0	0	0	0
Name listed on formal rights document: Member 17	311	0	0	0	0	477	0	0	0	0
HH has informal rights document for dwelling parcel	637	0.421	0.494	0	1	951	0.54	0.499	0	1
HH has certificate of occupancy (COO) for this parcel	51	0.333	0.476	0	1	119	0.193	0.397	0	1
HH has sought to acquire a COO for this parcel	34	0.294	0.462	0	1	94	0.319	0.469	0	1
HH has formal title for this parcel	573	0.159	0.366	0	1	1,020	0.131	0.338	0	1
Bussulu Payment										
Year bussulu was last paid on this parcel: Never	340	0.382	0.487	0	1	744	0.27	0.444	0	1
Year bussulu was last paid on this parcel: 2017	340	0.056	0.23	0	1	744	0.113	0.317	0	1
Year bussulu was last paid on this parcel: 2018	340	0.035	0.185	0	1	744	0.015	0.121	0	1
Year bussulu was last paid on this parcel: 2019	340	0.024	0.152	0	1	744	0.022	0.145	0	1
Year bussulu was last paid on this parcel: 2020	340	0.079	0.271	0	1	744	0.055	0.228	0	1
Year bussulu was last paid on this parcel: 2021	340	0.065	0.246	0	1	744	0.075	0.264	0	1
Year bussulu was last paid on this parcel: 2022	340	0.129	0.336	0	1	744	0.188	0.391	0	1
Year bussulu was last paid on this parcel: 2023	340	0.121	0.326	0	1	744	0.159	0.366	0	1
Year bussulu was last paid on this parcel: Not sure	340	0.109	0.312	0	1	744	0.103	0.305	0	1
Frequency of bussulu payment on this parcel: Never	198	0.222	0.417	0	1	520	0.225	0.418	0	1
Frequency of bussulu payment on this parcel: Once	198	0.131	0.339	0	1	520	0.063	0.244	0	1
Frequency of bussulu payment on this parcel: Twice	198	0.025	0.157	0	1	520	0.06	0.237	0	1
Frequency of bussulu payment on this parcel: Three times	198	0.03	0.172	0	1	520	0.081	0.273	0	1
Frequency of bussulu payment on this parcel: Four times	198	0.056	0.23	0	1	520	0.106	0.308	0	1
Frequency of bussulu payment on this parcel: Annually	198	0.535	0.5	0	1	520	0.465	0.499	0	1
Amount of bussulu payment on this parcel	230	25,612	55,863	1	500,000	550	34,042	133,998	1	2,000,000
Knowledge										
Respondent knows what a COO is	580	0.091	0.288	0	1	1,019	0.124	0.329	0	1
Female HH head knows what a COO is	179	0.106	0.309	0	1	214	0.126	0.333	0	1

Male HH head knows what a COO is	311	0.141	0.349	0	1	539	0.23	0.421	0	1
Female HH head: female tenant, eviction w/o compensation hypothetical	175	0.046	0.209	0	1	221	0.027	0.163	0	1
Male HH head: female tenant, eviction w/o compensation hypothetical	314	0.041	0.2	0	1	537	0.058	0.233	0	1
Female HH head: tenant couple moved to city, eviction w/o compensation hypothetical	172	0.209	0.408	0	1	219	0.297	0.458	0	1
Male HH head: tenant couple moved to city, eviction w/o compensation hypothetical	310	0.229	0.421	0	1	537	0.263	0.44	0	1
Female HH head: landlord wants to sell, eviction w/o compensation hypothetical	178	0.045	0.208	0	1	219	0.027	0.164	0	1
Male HH head: landlord wants to sell, eviction w/o compensation hypothetical	311	0.042	0.2	0	1	537	0.035	0.185	0	1
Female HH head: female tenant, selling kibanja to cousin hypothetical	181	0.083	0.276	0	1	220	0.055	0.228	0	1
Male HH head: female tenant, selling kibanja to cousin hypothetical	313	0.099	0.299	0	1	536	0.104	0.306	0	1
Male HH head: Wife knows what a COO is	50	0.06	0.24	0	1	101	0.109	0.313	0	1
Female HH head: Husband knows what a COO is	0	NaN	NA	<i>Inf</i>	<i>-Inf</i>	0	NaN	NA	<i>Inf</i>	<i>-Inf</i>

Land Rights

Someone in HH has ownership rights to parcel	595	0.775	0.418	0	1	1,040	0.866	0.34	0	1
Permission to give this parcel to heirs: No	587	0.157	0.364	0	1	1,026	0.097	0.297	0	1
Permission to give this parcel to heirs: Yes, without authorization	587	0.618	0.486	0	1	1,026	0.655	0.476	0	1
Permission to give this parcel to heirs: Yes, with authorization	587	0.225	0.418	0	1	1,026	0.248	0.432	0	1
Permission to rent parcel to someone else: No	591	0.24	0.428	0	1	1,035	0.256	0.437	0	1
Permission to rent parcel to someone else: Yes, without authorization	591	0.592	0.492	0	1	1,035	0.607	0.489	0	1
Permission to rent parcel to someone else: Yes, with authorization	591	0.168	0.374	0	1	1,035	0.137	0.344	0	1
Permission to sell parcel to someone else: No	593	0.346	0.476	0	1	1,026	0.303	0.46	0	1
Permission to sell parcel to someone else: Yes, without authorization	593	0.445	0.497	0	1	1,026	0.462	0.499	0	1
Permission to sell parcel to someone else: Yes, with authorization	593	0.209	0.407	0	1	1,026	0.235	0.424	0	1
HH has right to use parcel as collateral	589	0.625	0.485	0	1	1,017	0.587	0.493	0	1

Tenure Security

Respondent has concern that someone might dispute their rights to this parcel	589	0.363	0.481	0	1	1,023	0.349	0.477	0	1
Worry about losing rights to parcel in next 5 years: Very worried	561	0.205	0.404	0	1	1,011	0.183	0.387	0	1
Worry about losing rights to parcel in next 5 years: Somewhat worried	561	0.146	0.354	0	1	1,011	0.175	0.38	0	1
Worry about losing rights to parcel in next 5 years: Slightly worried	561	0.103	0.305	0	1	1,011	0.109	0.312	0	1
Worry about losing rights to parcel in next 5 years: Not worried	561	0.545	0.498	0	1	1,011	0.533	0.499	0	1
Likelihood of losing rights to parcel in next 5 years: Very unlikely	559	0.553	0.498	0	1	1,000	0.524	0.5	0	1
Likelihood of losing rights to parcel in next 5 years: Somewhat unlikely	559	0.113	0.317	0	1	1,000	0.116	0.32	0	1
Likelihood of losing rights to parcel in next 5 years: Neither unlikely nor likely	559	0.041	0.199	0	1	1,000	0.056	0.23	0	1
Likelihood of losing rights to parcel in next 5 years: Somewhat likely	559	0.191	0.394	0	1	1,000	0.23	0.421	0	1
Likelihood of losing rights to parcel in next 5 years: Very likely	559	0.102	0.303	0	1	1,000	0.074	0.262	0	1
Likelihood of losing rights to parcel if landlord sells it: Very unlikely	545	0.517	0.5	0	1	988	0.474	0.5	0	1
Likelihood of losing rights to parcel if landlord sells it: Somewhat unlikely	545	0.09	0.286	0	1	988	0.106	0.308	0	1
Likelihood of losing rights to parcel if landlord sells it: Neither unlikely nor likely	545	0.044	0.205	0	1	988	0.053	0.223	0	1
Likelihood of losing rights to parcel if landlord sells it: Somewhat likely	545	0.183	0.387	0	1	988	0.24	0.427	0	1
Likelihood of losing rights to parcel if landlord sells it: Very likely	545	0.165	0.372	0	1	988	0.128	0.334	0	1
Likelihood of losing rights to parcel if left fallow for several months: 0%	569	0.675	0.469	0	1	1,005	0.589	0.492	0	1
Likelihood of losing rights to parcel if left fallow for several months: 25%	569	0.112	0.316	0	1	1,005	0.126	0.332	0	1
Likelihood of losing rights to parcel if left fallow for several months: 50%	569	0.051	0.22	0	1	1,005	0.09	0.286	0	1
Likelihood of losing rights to parcel if left fallow for several months: 75%	569	0.093	0.291	0	1	1,005	0.131	0.338	0	1
Likelihood of losing rights to parcel if left fallow for several months: 100%	569	0.069	0.253	0	1	1,005	0.064	0.244	0	1
Likelihood of disagreement about parcel rights in next 5 years: 0%	563	0.696	0.46	0	1	1,008	0.612	0.488	0	1
Likelihood of disagreement about parcel rights in next 5 years: 25%	563	0.121	0.326	0	1	1,008	0.15	0.357	0	1
Likelihood of disagreement about parcel rights in next 5 years: 50%	563	0.067	0.251	0	1	1,008	0.091	0.288	0	1
Likelihood of disagreement about parcel rights in next 5 years: 75%	563	0.075	0.263	0	1	1,008	0.105	0.307	0	1
Likelihood of disagreement about parcel rights in next 5 years: 100%	563	0.041	0.198	0	1	1,008	0.042	0.2	0	1
Fears land dispute about parcel in next 5 years	563	0.25	0.434	0	1	1,000	0.261	0.439	0	1
Male HH head: Wife thinks a COO would decrease their likelihood of eviction	3	1	0	1	1	11	0.727	0.467	0	1
Have left parcel fallow at some point in past 5 years	881	0.098	0.297	0	1	1,480	0.097	0.296	0	1
Year this parcel was left fallow: 2017	86	0.233	0.425	0	1	144	0.208	0.408	0	1
Year this parcel was left fallow: 2018	86	0.198	0.401	0	1	144	0.181	0.386	0	1
Year this parcel was left fallow: 2019	86	0.244	0.432	0	1	144	0.285	0.453	0	1
Year this parcel was left fallow: 2020	86	0.291	0.457	0	1	144	0.285	0.453	0	1
Year this parcel was left fallow: 2021	86	0.279	0.451	0	1	144	0.319	0.468	0	1
Year this parcel was left fallow: 2022	86	0.36	0.483	0	1	144	0.424	0.496	0	1
Year this parcel was left fallow: 2023	86	0.337	0.476	0	1	144	0.361	0.482	0	1
Type of fallow used: Cover crop	86	0.209	0.409	0	1	144	0.299	0.459	0	1
Type of fallow used: Residue incorporation	86	0.023	0.152	0	1	144	0.083	0.277	0	1
Type of fallow used: Bare fallow	86	0.767	0.425	0	1	144	0.618	0.488	0	1

Conflict

Had land disputes or disagreements about parcel in past 12 months	522	0.174	0.38	0	1	840	0.16	0.366	0	1
How likely is dispute over parcel in next 5 years: 0%	528	0.574	0.495	0	1	841	0.539	0.499	0	1
How likely is dispute over parcel in next 5 years: 25%	528	0.157	0.364	0	1	841	0.194	0.396	0	1
How likely is dispute over parcel in next 5 years: 50%	528	0.106	0.308	0	1	841	0.109	0.312	0	1
How likely is dispute over parcel in next 5 years: 75%	528	0.114	0.318	0	1	841	0.124	0.329	0	1
How likely is dispute over parcel in next 5 years: 100%	528	0.049	0.217	0	1	841	0.034	0.183	0	1
Anyone in HH had dispute about parcel since 2017	591	0.112	0.315	0	1	1,026	0.105	0.307	0	1
Number of conflicts about parcel since 2017	66	1.333	0.829	0	5	108	1.315	1.02	0	7

Investment

Parcel has outbuildings on it	894	0.549	0.498	0	1	1,501	0.532	0.499	0	1
Parcel is irrigated	892	0.028	0.165	0	1	1,499	0.019	0.135	0	1
Used organic fertilizer on parcel	887	0.33	0.471	0	1	1,491	0.376	0.484	0	1
Used inorganic/chemical fertilizer on parcel	887	0.194	0.396	0	1	1,484	0.189	0.392	0	1
Used any pesticides on parcel	883	0.43	0.495	0	1	1,485	0.387	0.487	0	1
Used insecticide that HH purchased on parcel	281	0.975	0.156	0	1	502	0.986	0.117	0	1
Hired labor to work on parcel in 1st season of 2023	889	0.209	0.407	0	1	1,485	0.241	0.428	0	1
Number of person-days for which men were hired for this parcel	185	13	22	0	150	358	182	3,171	0	60,000
Number of person-days for which women were hired for this parcel	185	3.054	9.604	0	81	358	4.721	16.015	0	180
Number of person-days for which children were hired for this parcel	185	0	1	0	9	358	196	3,700	0	70,000

Uganda Mailo Endline Survey

Summary aggregated by parcel or HH GIZ mapping status

Item	Not mapped by GIZ					Mapped by GIZ				
	N	Mean	St.Dev	Min	Max	N	Mean	St.Dev	Min	Max
General covariates and indicators										
Parcel mapped by GIZ	709	0.364	0.481	0	1	375	0.205	0.404	0	1
Sex of HH member: Female	5,091	0.703	0.457	0	1	1,955	0.727	0.446	0	1
Sex of HH head: Female	1,145	0.367	0.482	0	1	442	0.305	0.461	0	1
HH head born in village (among respondents)	236	0.568	0.496	0	1	71	0.465	0.502	0	1
HH head born in village (all HHs)	902	0.533	0.499	0	1	370	0.546	0.499	0	1
Number of HH members	1,146	6.935	3.425	1	27	442	7.045	3.338	1	27
Relationship to HH head: Self	6,778	0.003	0.056	0	1	2,659	0.002	0.047	0	1
Relationship to HH head: Spouse	6,778	0.122	0.328	0	1	2,659	0.125	0.331	0	1
Relationship to HH head: Child	6,778	0.548	0.498	0	1	2,659	0.567	0.496	0	1
Relationship to HH head: Grandchild	6,778	0.243	0.429	0	1	2,659	0.239	0.426	0	1
Relationship to HH head: Parent	6,778	0.005	0.073	0	1	2,659	0.006	0.075	0	1
Relationship to HH head: Sibling	6,778	0.023	0.15	0	1	2,659	0.017	0.129	0	1
Relationship to HH head: Child of sibling	6,778	0.016	0.126	0	1	2,659	0.015	0.12	0	1
Relationship to HH head: Other	6,778	0.021	0.143	0	1	2,659	0.018	0.132	0	1
Relationship to HH head: Not related	6,778	0.018	0.132	0	1	2,659	0.012	0.107	0	1
HH member can read	5,090	0.865	0.342	0	1	1,957	0.871	0.336	0	1
HH member has attended formal schooling	9,234	0.06	0.238	0	1	4,950	0.061	0.239	0	1
Respondent is related to landlord	1,122	0.093	0.29	0	1	477	0.157	0.364	0	1
Landlord or kibanja holder: Landlord	1,146	0.12	0.326	0	1	442	0.07	0.256	0	1
Landlord or kibanja holder: Kibanja holder	1,146	0.713	0.453	0	1	442	0.867	0.34	0	1
Documentation										
Landlord or kibanja holder: Neither	1,146	0.167	0.373	0	1	442	0.063	0.244	0	1
HH has formal rights document for dwelling parcel	892	0.575	0.495	0	1	407	0.676	0.469	0	1
Name listed on formal rights document: None	513	0.29	0.454	0	1	275	0.153	0.36	0	1
Name listed on formal rights document: Member 1	513	0.665	0.473	0	1	275	0.818	0.386	0	1
Name listed on formal rights document: Member 2	513	0.086	0.28	0	1	275	0.084	0.277	0	1
Name listed on formal rights document: Member 3	513	0.01	0.098	0	1	275	0.015	0.12	0	1
Name listed on formal rights document: Member 4	513	0.004	0.062	0	1	275	0.007	0.085	0	1
Name listed on formal rights document: Member 5	513	0.01	0.098	0	1	275	0.004	0.06	0	1
Name listed on formal rights document: Member 6	513	0.012	0.108	0	1	275	0.007	0.085	0	1
Name listed on formal rights document: Member 7	513	0.002	0.044	0	1	275	0	0	0	0
Name listed on formal rights document: Member 8	513	0.006	0.076	0	1	275	0.004	0.06	0	1
Name listed on formal rights document: Member 9	513	0.002	0.044	0	1	275	0	0	0	0
Name listed on formal rights document: Member 10	513	0	0	0	0	275	0	0	0	0
Name listed on formal rights document: Member 11	513	0	0	0	0	275	0	0	0	0
Name listed on formal rights document: Member 12	513	0	0	0	0	275	0.004	0.06	0	1
Name listed on formal rights document: Member 13	513	0	0	0	0	275	0	0	0	0
Name listed on formal rights document: Member 14	513	0	0	0	0	275	0	0	0	0
Name listed on formal rights document: Member 15	513	0	0	0	0	275	0	0	0	0
Name listed on formal rights document: Member 16	513	0	0	0	0	275	0	0	0	0
Name listed on formal rights document: Member 17	513	0	0	0	0	275	0	0	0	0
HH has informal rights document for dwelling parcel	1,146	0.452	0.498	0	1	442	0.597	0.491	0	1
HH has certificate of occupancy (COO) for this parcel	78	0.244	0.432	0	1	50	0.42	0.499	0	1
HH has sought to acquire a COO for this parcel	1,112	0.147	0.354	0	1	481	0.129	0.335	0	1
HH has formal title for this parcel	1,849	0.096	0.295	0	1	512	0.102	0.302	0	1
Bussulu Payment										
Year bussulu was last paid on this parcel: Never	709	0.09	0.287	0	1	375	0.104	0.306	0	1
Year bussulu was last paid on this parcel: 2017	709	0.024	0.153	0	1	375	0.016	0.126	0	1
Year bussulu was last paid on this parcel: 2018	709	0.021	0.144	0	1	375	0.024	0.153	0	1
Year bussulu was last paid on this parcel: 2019	709	0.062	0.241	0	1	375	0.064	0.245	0	1
Year bussulu was last paid on this parcel: 2020	709	0.052	0.223	0	1	375	0.109	0.312	0	1
Year bussulu was last paid on this parcel: 2021	709	0.118	0.323	0	1	375	0.267	0.443	0	1
Year bussulu was last paid on this parcel: 2022	709	0.128	0.335	0	1	375	0.181	0.386	0	1
Year bussulu was last paid on this parcel: 2023	709	0.121	0.327	0	1	375	0.075	0.263	0	1
Year bussulu was last paid on this parcel: Not sure	178	0.242	0.429	0	1	52	0.346	0.48	0	1
Frequency of bussulu payment on this parcel: Never	413	0.097	0.296	0	1	305	0.062	0.242	0	1
Frequency of bussulu payment on this parcel: Once	413	0.039	0.193	0	1	305	0.066	0.248	0	1
Frequency of bussulu payment on this parcel: Twice	413	0.051	0.22	0	1	305	0.089	0.285	0	1
Frequency of bussulu payment on this parcel: Three times	413	0.058	0.234	0	1	305	0.138	0.345	0	1
Frequency of bussulu payment on this parcel: Four times	413	0.487	0.5	0	1	305	0.482	0.5	0	1
Frequency of bussulu payment on this parcel: Annually	1,127	0.146	0.353	0	1	486	0.058	0.233	0	1
Amount of bussulu payment on this parcel	1,878	0.513	0.5	0	1	517	0.631	0.483	0	1
Knowledge										
Respondent knows what a COO is	98	0.184	0.389	0	1	72	0.306	0.464	0	1
Female HH head knows what a COO is	293	0.102	0.304	0	1	100	0.16	0.368	0	1

Male HH head knows what a COO is	587	0.162	0.369	0	1	263	0.278	0.449	0	1
Female HH head: female tenant, eviction w/o compensation hypothetical	293	0.041	0.199	0	1	103	0.019	0.139	0	1
Male HH head: female tenant, eviction w/o compensation hypothetical	587	0.048	0.213	0	1	264	0.061	0.239	0	1
Female HH head: tenant couple moved to city, eviction w/o compensation hypothetical	288	0.243	0.43	0	1	103	0.301	0.461	0	1
Male HH head: tenant couple moved to city, eviction w/o compensation hypothetical	583	0.238	0.426	0	1	264	0.277	0.448	0	1
Female HH head: landlord wants to sell, eviction w/o compensation hypothetical	294	0.044	0.206	0	1	103	0.01	0.099	0	1
Male HH head: landlord wants to sell, eviction w/o compensation hypothetical	585	0.038	0.19	0	1	263	0.038	0.192	0	1
Female HH head: female tenant, selling kibanja to cousin hypothetical	300	0.073	0.261	0	1	101	0.05	0.218	0	1
Male HH head: female tenant, selling kibanja to cousin hypothetical	585	0.106	0.308	0	1	264	0.095	0.293	0	1
Male HH head: Wife knows what a COO is	94	0.053	0.226	0	1	57	0.158	0.368	0	1
Female HH head: Husband knows what a COO is	0	NaN	NA	Inf	-Inf	0	NaN	NA	Inf	-Inf

Land Rights

Someone in HH has ownership rights to parcel	1,124	0.576	0.494	0	1	482	0.66	0.474	0	1
Permission to give this parcel to heirs: No	1,127	0.63	0.483	0	1	486	0.669	0.471	0	1
Permission to give this parcel to heirs: Yes, without authorization	1,127	0.224	0.417	0	1	486	0.274	0.446	0	1
Permission to give this parcel to heirs: Yes, with authorization	1,136	0.268	0.443	0	1	490	0.208	0.406	0	1
Permission to rent parcel to someone else: No	1,136	0.591	0.492	0	1	490	0.627	0.484	0	1
Permission to rent parcel to someone else: Yes, without authorization	1,136	0.141	0.348	0	1	490	0.165	0.372	0	1
Permission to rent parcel to someone else: Yes, with authorization	1,132	0.355	0.479	0	1	487	0.234	0.424	0	1
Permission to sell parcel to someone else: No	1,132	0.445	0.497	0	1	487	0.48	0.5	0	1
Permission to sell parcel to someone else: Yes, without authorization	1,132	0.2	0.4	0	1	487	0.285	0.452	0	1
Permission to sell parcel to someone else: Yes, with authorization	1,091	0.205	0.404	0	1	481	0.158	0.365	0	1
HH has right to use parcel as collateral	1,126	0.364	0.481	0	1	486	0.331	0.471	0	1

Tenure Security

Respondent has concern that someone might dispute their rights to this parcel	1,132	0.124	0.329	0	1	485	0.07	0.256	0	1
Worry about losing rights to parcel in next 5 years: Very worried	1,091	0.155	0.362	0	1	481	0.187	0.39	0	1
Worry about losing rights to parcel in next 5 years: Somewhat worried	1,091	0.108	0.311	0	1	481	0.104	0.306	0	1
Worry about losing rights to parcel in next 5 years: Slightly worried	1,091	0.532	0.499	0	1	481	0.551	0.498	0	1
Worry about losing rights to parcel in next 5 years: Not worried	1,084	0.532	0.499	0	1	475	0.539	0.499	0	1
Likelihood of losing rights to parcel in next 5 years: Very unlikely	1,084	0.113	0.317	0	1	475	0.118	0.323	0	1
Likelihood of losing rights to parcel in next 5 years: Somewhat unlikely	1,084	0.049	0.216	0	1	475	0.055	0.228	0	1
Likelihood of losing rights to parcel in next 5 years: Neither unlikely nor likely	1,084	0.212	0.409	0	1	475	0.225	0.418	0	1
Likelihood of losing rights to parcel in next 5 years: Somewhat likely	1,084	0.093	0.291	0	1	475	0.063	0.244	0	1
Likelihood of losing rights to parcel in next 5 years: Very likely	1,062	0.491	0.5	0	1	471	0.486	0.5	0	1
Likelihood of losing rights to parcel if landlord sells it: Very unlikely	1,062	0.099	0.299	0	1	471	0.104	0.306	0	1
Likelihood of losing rights to parcel if landlord sells it: Somewhat unlikely	1,062	0.046	0.21	0	1	471	0.057	0.233	0	1
Likelihood of losing rights to parcel if landlord sells it: Neither unlikely nor likely	1,062	0.208	0.406	0	1	471	0.246	0.431	0	1
Likelihood of losing rights to parcel if landlord sells it: Somewhat likely	1,062	0.156	0.363	0	1	471	0.106	0.308	0	1
Likelihood of losing rights to parcel if landlord sells it: Very likely	1,096	0.62	0.485	0	1	478	0.619	0.486	0	1
Likelihood of losing rights to parcel if left fallow for several months: 0%	1,096	0.115	0.319	0	1	478	0.136	0.343	0	1
Likelihood of losing rights to parcel if left fallow for several months: 25%	1,096	0.067	0.249	0	1	478	0.096	0.295	0	1
Likelihood of losing rights to parcel if left fallow for several months: 50%	1,096	0.128	0.334	0	1	478	0.094	0.292	0	1
Likelihood of losing rights to parcel if left fallow for several months: 75%	1,096	0.07	0.256	0	1	478	0.054	0.227	0	1
Likelihood of losing rights to parcel if left fallow for several months: 100%	1,093	0.644	0.479	0	1	478	0.638	0.481	0	1
Likelihood of disagreement about parcel rights in next 5 years: 0%	1,093	0.129	0.335	0	1	478	0.163	0.37	0	1
Likelihood of disagreement about parcel rights in next 5 years: 25%	1,093	0.081	0.272	0	1	478	0.088	0.283	0	1
Likelihood of disagreement about parcel rights in next 5 years: 50%	1,093	0.102	0.302	0	1	478	0.077	0.268	0	1
Likelihood of disagreement about parcel rights in next 5 years: 75%	1,093	0.045	0.207	0	1	478	0.033	0.18	0	1
Likelihood of disagreement about parcel rights in next 5 years: 100%	6,778	0.555	0.497	0	1	2,659	0.557	0.497	0	1
Fears land dispute about parcel in next 5 years	1,864	0.347	0.476	0	1	514	0.403	0.491	0	1
Male HH head: Wife thinks a COO would decrease their likelihood of eviction	5	0.6	0.548	0	1	9	0.889	0.333	0	1
Have left parcel fallow at some point in past 5 years	178	0.225	0.419	0	1	52	0.192	0.398	0	1
Year this parcel was left fallow: 2017	178	0.185	0.39	0	1	52	0.192	0.398	0	1
Year this parcel was left fallow: 2018	178	0.242	0.429	0	1	52	0.365	0.486	0	1
Year this parcel was left fallow: 2019	178	0.309	0.463	0	1	52	0.212	0.412	0	1
Year this parcel was left fallow: 2020	178	0.287	0.453	0	1	52	0.365	0.486	0	1
Year this parcel was left fallow: 2021	178	0.421	0.495	0	1	52	0.327	0.474	0	1
Year this parcel was left fallow: 2022	178	0.382	0.487	0	1	52	0.25	0.437	0	1
Year this parcel was left fallow: 2023	470	25,672	57,807	1	700,000	310	40,477	170,432	1	2,000,000
Type of fallow used: Cover crop	178	0.051	0.22	0	1	52	0.096	0.298	0	1
Type of fallow used: Residue incorporation	178	0.708	0.456	0	1	52	0.558	0.502	0	1
Type of fallow used: Bare fallow	413	0.269	0.444	0	1	305	0.164	0.371	0	1

Conflict

Had land disputes or disagreements about parcel in past 12 months	949	0.169	0.375	0	1	413	0.157	0.365	0	1
How likely is dispute over parcel in next 5 years: 0%	955	0.547	0.498	0	1	414	0.565	0.496	0	1
How likely is dispute over parcel in next 5 years: 25%	955	0.173	0.378	0	1	414	0.196	0.397	0	1
How likely is dispute over parcel in next 5 years: 50%	955	0.104	0.305	0	1	414	0.118	0.323	0	1
How likely is dispute over parcel in next 5 years: 75%	955	0.131	0.337	0	1	414	0.094	0.292	0	1
How likely is dispute over parcel in next 5 years: 100%	955	0.046	0.21	0	1	414	0.027	0.161	0	1
Anyone in HH had dispute about parcel since 2017	140	1.371	0.97	0	7	34	1.118	0.844	0	5
Number of conflicts about parcel since 2017	1,090	0.265	0.442	0	1	473	0.239	0.427	0	1

Investment

Parcel has outbuildings on it	1,875	0.023	0.15	0	1	516	0.019	0.138	0	1
Parcel is irrigated	1,143	0.796	0.403	0	1	492	0.919	0.274	0	1
Used organic fertilizer on parcel	1,858	0.193	0.395	0	1	513	0.183	0.387	0	1
Used inorganic/chemical fertilizer on parcel	1,856	0.408	0.492	0	1	512	0.385	0.487	0	1
Used any pesticides on parcel	618	0.977	0.149	0	1	165	1	0	1	1
Used insecticide that HH purchased on parcel	1,862	0.227	0.419	0	1	512	0.236	0.425	0	1
Hired labor to work on parcel in 1st season of 2023	422	13	30	0	400	121	510	5,453	0	60,000
Number of person-days for which men were hired for this parcel	422	3.877	12.667	0	180	121	5.116	18.524	0	180
Number of person-days for which women were hired for this parcel	422	166.097	3,407.536	0	70,000	121	0.603	5.479	0	60
Number of person-days for which children were hired for this parcel	709	0.382	0.486	0	1	375	0.16	0.367	0	1

B Balance Analysis

The team looked at balance across key indicators between treatment and control areas. Overall, the team found balance between treatment and comparison groups on just under 70 percent of indicators. Indicator balance is good between treatment and control areas. While many indicators are similar, they also differ in some fundamental ways: livelihoods, displacement, born locally, documentation, reported familiarity with forest rules, and income from forests. Please refer to Figure B for the full results of the balance analysis.

Item	Control Mean	Treatment Difference	P-Value
Female HH head	0.377 (0.019)	-0.046 (0.024)	0.058
HH head born locally	0.528 (0.02)	0.018 (0.025)	0.483
HH size	5.323 (0.113)	-0.123 (0.146)	0.401
HH head or spouse knows of COO	0.135 (0.015)	0.088 (0.02)	0
HH has literate member	0.879 (0.013)	-0.02 (0.017)	0.261
Ag worker in HH	0.074 (0.011)	0.011 (0.014)	0.443
Non-ag elementary worker in HH	0.025 (0.007)	0.004 (0.008)	0.598
Service worker in HH	0.02 (0.006)	0.003 (0.008)	0.708
Trade or factory worker in HH	0.008 (0.005)	0.019 (0.007)	0.008
Other occupation in HH	0.006 (0.004)	0.007 (0.005)	0.159
HH experienced conflict in past 5 years	0.115 (0.014)	0.053 (0.018)	0.003
Head of HH performs wage labor	0.102 (0.013)	0.034 (0.017)	0.042
Acreage of primary parcel	1.687 (2.002)	2.424 (2.589)	0.349
Has bank account	0.079 (0.013)	0.059 (0.016)	0
Experienced food shortage, past year	0.217 (0.016)	0.01 (0.021)	0.638
Asset wealth, PCA index	0.243 (0.165)	0.156 (0.213)	0.465
Primary dwelling is detached house	0.936 (0.01)	-0.01 (0.013)	0.466
Has ever paid bussulu	0.229 (0.018)	0.094 (0.023)	0
Concern over losing land if landlord changes	2.708 (0.054)	0.042 (0.07)	0.553

Figure 48: Balance Between Treatment and Control Groups on Key Indicators (Pre-Matching)

There are no significant differences between treatment and control households in terms of

gender, migration, household size, education, most livelihood activities, primary household parcel size (acres), food security, asset wealth, primary dwelling type, or concern over losing land if landlord changes.

There are some economic indicators with significant differences between treatment and control areas. Treatment households are more likely to have a bank account (14 percent versus 8 percent). Treatment households are also slightly, but significantly, more likely to have a member engaged in trade or factory work (3 percent treatment versus 0.008 percent control) and for the head of household to perform wage labor (14 percent treatment versus 10 percent control).

In terms of land and governance indicators, more treatment households have ever paid busuulu (32 percent treatment versus 23 percent control). The household head or spouse is also more likely to know of the COO in treatment areas (22 percent treatment versus 14 percent control). More treatment households experienced land conflict in the five years than control households (17 percent treatment versus 12 percent controls).

To determine if pre-processing techniques improved balance, we tested three methods: propensity score matching using Mahalanobis distance, genetic matching, and entropy balancing. All schemes here were optimized for precision of the ATT estimate, so the treatment sample size is 947 in all schemes.

All three techniques help to improve balance (see Figures 49, 50, 51). Entropy balancing outperforms both matching methods on minimizing absolute standardized mean difference and has an effective control sample size of approximately 290 observations. Genetic matching performed slightly better than simple propensity score matching on both absolute standardized mean differences and effective sample size. Genetic matching has an effective control sample size of 264 for the control cohort versus 637 in the unmatched control sample.

Based on this analysis, we recommends running the main specifications described throughout this report with entropy-weighted results as a robustness check. The caveat is that, while the entropy-weighted sample will be better balanced, it also has a smaller effective sample size. This means that the interpretation of findings for the entropy-weighted set are specific to the "best balanced" households versus the full treatment sample. These entropy weighted specifications will be added and assessed in the next iteration of this report.

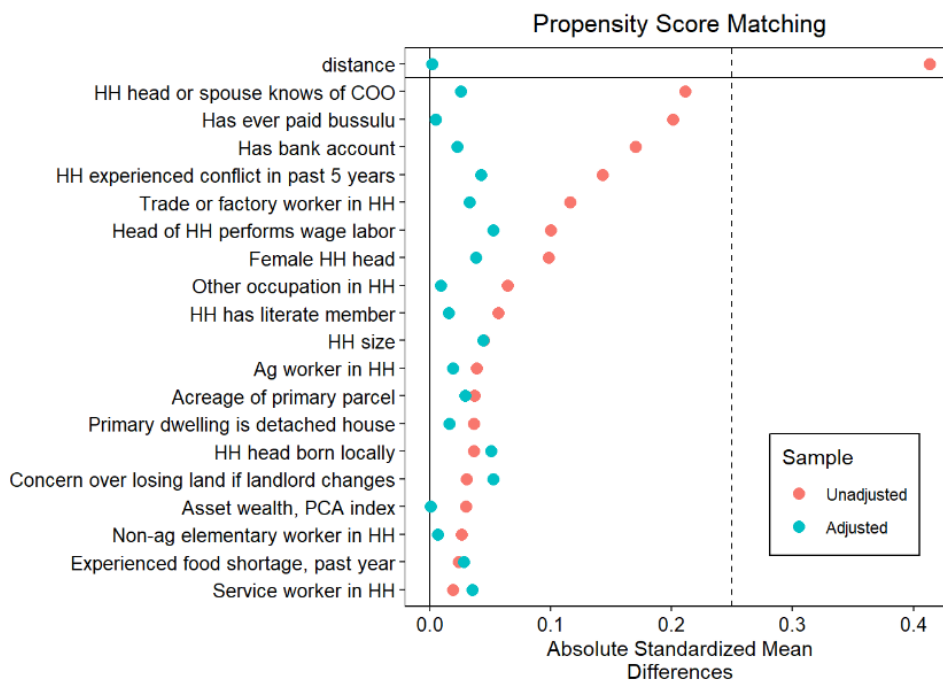


Figure 49: Propensity Score Matching Results



Figure 50: Genetic Matching Results

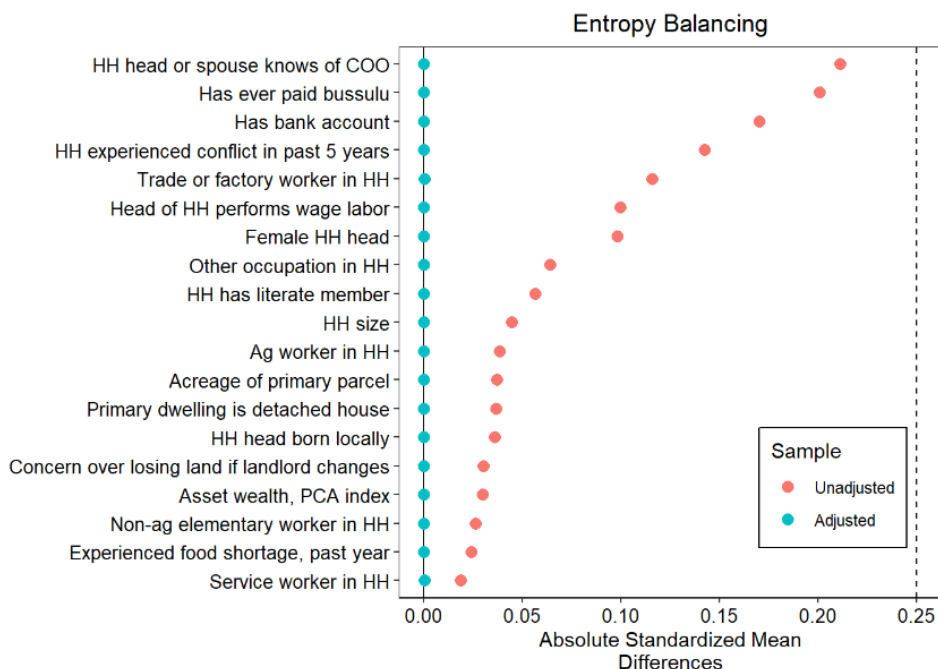


Figure 51: Entropy Balancing Results

C Supplemental Feature Importance Analysis

The evaluation finds variation in the extent of mapping and LIP provision within the treatment area. We used baseline data to fit random forest models to two key endline conditions: 1) whether a parcel was mapped by GIZ and 2) among the households with a mapped parcel, which ones received a LIP. The random forest models examine 55 baseline indicators to calculate which baseline features are most predictive of these endline implementation outcomes. This analysis finds that there are observable differences in the wealth-tracking predictors among participants and non-participants for both GIZ-mapping and LIP-obtainment, and a mixture of lower-wealth and higher-wealth averages are associated with participation.

C.1 Predictors of Mapping by GIZ

Overall, the analysis finds that baseline treatment indicators of total household wealth and farming revenue are more predictive of eventual GIZ-mapping status than baseline survey items that track experience with or proximity to land conflict.

The model performs moderately well (Figure 52). Sensitivity (y-axis) describes the proportion of those mapped by GIZ correctly predicted with the model while specificity (x-axis) is the proportion of the overall sample selected to get to that level of sensitivity. According to this graph, we can correctly identify about 75 percent of the mapped households by

guessing the most likely 50 percent of the cohort. These two metrics are locked in a tradeoff illustrated by the black line above. More area under the curve is better.

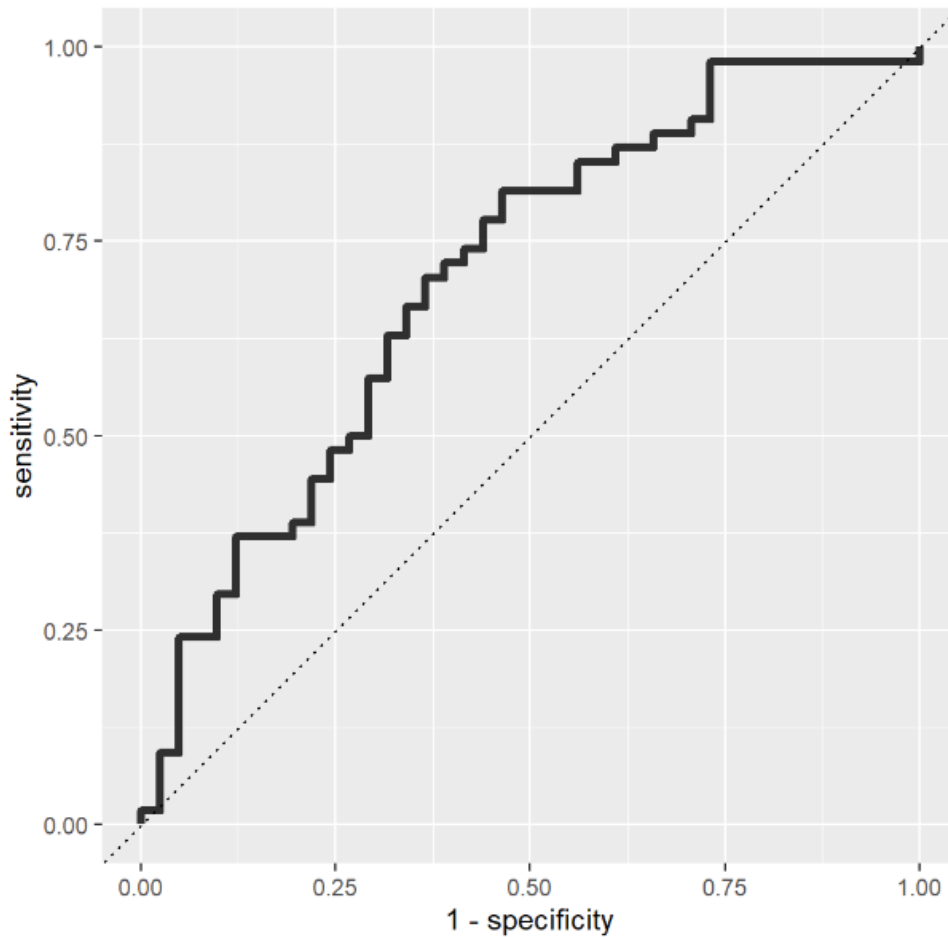


Figure 52: GIZ Map Random Forests Model Sensitivity

In this random forest model trained to predict who was mapped by GIZ, the five most important variables in determining the predicted outcome include, in order of importance:- amount of busuulu paid, asset wealth, expected value of crops sold, value of crops sold, and total landholdings (Figure 53). Specifically, those who were eventually mapped by ILGU paid a higher amount of busuulu, had slightly larger landholdings, and reported a slightly higher value of crops already sold at the time of their interview.

The feature importance model is important for a relative versus absolute assessment of the importance of various factors. The absolute magnitude of importance scores does not have a useful interpretation for the analysis.

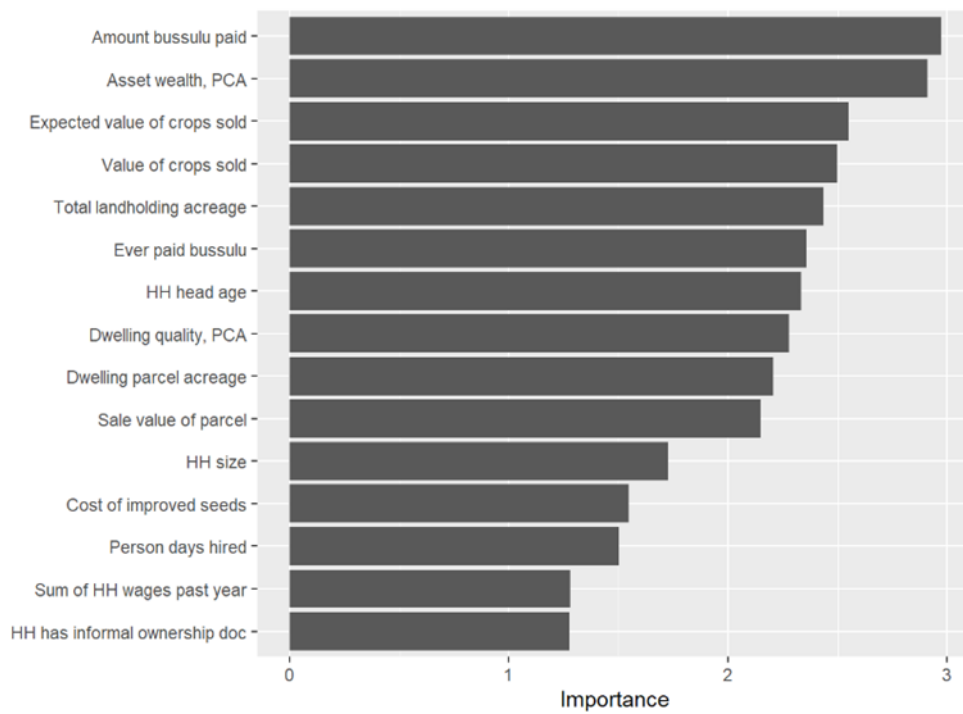


Figure 53: GIZ Map Feature Importance

Table 50: Summary statistics for important GIZ-mapping predictors

Item	No parcels mapped by GIZ					At least 1 parcel mapped by GIZ				
	N	Mean	St.Dev	Min	Max	N	Mean	St.Dev	Min	Max
Amount bussulu paid	532	4,075	11,226	0	150,000	409	9,994	19,143	0	150,000
Asset wealth, PCA	532	0.289	1.227	-0.211	16.188	409	0.154	0.561	-0.193	4.696
Expected value of crops sold	532	1,422,937	8,624,039	0	126,600,000	409	1,034,742	2,105,696	0	28,109,500
Value of crops sold	532	858,315	4,399,667	0	98,842,600	409	913,718	1,940,868	0	28,109,500
Total landholding acreage	532	3.463	5.209	0	67	409	3.777	4.18	0	52.5

C.2 Predictors of Receiving LIP

Among those mapped by ILGU, the five most important variables in determining the predicted outcome are all socio-economic indicators (Figure 54). These include, in order of importance: outbuildings, the size of the dwelling parcel, total landholdings, an asset wealth index, and the dwelling quality. With the exception of the asset wealth index, respondents who eventually received a LIP have more landholdings and better-quality dwellings. Essentially, the evidence indicates that those who were better off were modestly more likely to ultimately receive a LIP.

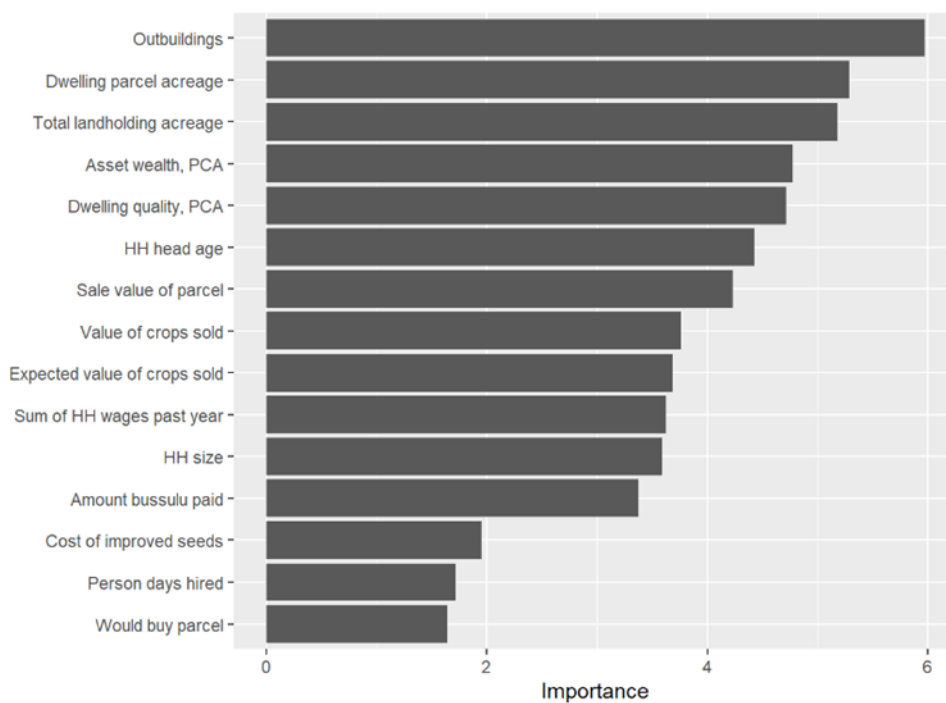


Figure 54: LIP Feature Importance

D Full Investment Results

Figure 55: Full Investment and Productivity Findings

Full Investment Findings

OUTCOME	EVALUA-TION FINDING	WOMEN	YOUTH	LARGE LAND-HOLDER	TENANT RELATED TO LAND-LORD
Investments	(Weak) Mixed	(Weak) Mixed	(Weak) Mixed	No change - weak	No change - weak
REGRESSION INDICATORS					
Followed parcel	No change	Very weak	No change	No change	Weak
Years followed	No change	Very weak	No change	No change	No change
Pesticide use	No change	No change	Very weak	Weak	No change
Pesticide purchase	Very weak - only ILGU direct beneficiaries	No change	No change	No change	No change
Organic fertilizer	Only ILGU direct beneficiaries	No change	No change	No change	No change
Inorganic fertilizer	No change	No change	No change	No change	No change
Field labor	No change	No change	Weak reduction	No change	No change
Irrigation	Very weak	No change	No change	No change	No change
Buildings	No change	No change	No change	No change	No change
Erosion control	No change	No change	Very weak	No change	No change
Improved seeds	No change	No change	No change	No change	No change
Payment for improved seeds	No change		Very weak	No change	No change
Coffee planting	No change	No change	No change	No change	No change
Tree planting	Weak	No change	No change	No change	No change
Dwelling quality	No change	No change	No change	No change	No change
Crop sales	No change	No change	No change	No change	No change
Expected crop sales	No change	No change	No change	No change	No change

E Interaction Effects

Table 51: Busuulu Payment Indicators

	Bussulu paid ever		Bussulu amount		Bussulu paid annually	
	(1)	(2)	(3)	(4)	(5)	(6)
	ITT	ATT	ITT	ATT	ITT	ATT
DiD-treat	0.129**	0.149***	-1531	2220		
	(0.052)	(0.052)	(4856)	(5336)		
CS-treat					-0.090	
					(-0.055)	
Treat × F head	0.092	0.124	-4060	1645	-0.099	
	(0.091)	(0.082)	(9165)	(7528)	(0.095)	
Treat × Young head	0.092	0.096	15910*	16206	-0.026	
	(0.111)	(0.109)	(8584)	(17990)	(0.123)	
Treat × Landed	0.370**	0.296**	21168**	10881	-0.289**	
	(0.145)	(0.131)	(8944)	(8044)	(0.122)	
Treat × Related LL	0.348***	0.076	4723	7027	-0.157	
	(0.124)	(0.139)	(13412)	(11879)	(0.113)	
Treat × Don't know LL	0.083	0.051	25731	31284***		
	(0.056)	(0.053)	(16147)	(11130)		
.	2,663	2,282	1,217	1,100	633	

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 52: Investment Indicators

(1)	Outbuildings		Irrigation		Organic fertilizer		Inorganic fertilizer		Pesticide usage		Pesticide purchases		Person days hired		Improved seeds used		Spending on seeds		Erosion control		Coffee planted		Trees planted		Coffee or trees planted			
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	
	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT		
DiD-geography	0.056**		-0.013		-0.037		0.042		-0.043		0.009		2.283		0.030		2.9e+06		0.047		-0.014		0.035**		0.017		0.005	
	(0.025)		(0.009)		(0.044)		(0.032)		(0.044)		(0.031)		(1.836)		(0.032)		(2.7e+06)		(0.041)		(0.028)		(0.017)		(0.030)			
DiD-treatment		0.049		-0.001		-0.087*		-0.024		-0.046		0.014		-0.894		-0.022		-7.0e+06		-0.018		-0.002		0.017		0.017	-0.022	
		(0.037)		(0.010)		(0.046)		(0.038)		(0.049)		(0.016)		(1.177)		(0.033)		(6.9e+06)		(0.048)		(0.037)		(0.015)		(0.033)		
Treat × F head	0.012	-0.002	-0.012	0.009	-0.135	-0.118	0.050	-0.031	-0.068	-0.030	-0.056	0.035	-0.609	-0.441	0.000	-0.040	2.3e+04	9.3e+04	0.047	0.001	0.017	-0.005	-0.012	-0.017	-0.009	-0.037		
	(0.040)	(0.058)	(0.015)	(0.016)	(0.063)	(0.074)	(0.046)	(0.053)	(0.065)	(0.072)	(0.054)	(0.035)	(0.945)	(1.076)	(0.046)	(0.053)	(1.9e+04)	(3.9e+04)	(0.073)	(0.081)	(0.047)	(0.067)	(0.029)	(0.024)	(0.051)	(0.059)		
Treat × Young head	0.089	0.127	0.016	-0.004	-0.077	-0.105	0.074	0.012	-0.096	-0.126	0.068	0.018	-1.590	1.146	0.054	-0.011	4.6e+04	7.3e+04	0.056	0.082	-0.009	0.006	0.039	-0.016	-0.014	-0.076		
	(0.053)	(0.073)	(0.015)	(0.026)	(0.073)	(0.088)	(0.071)	(0.088)	(0.091)	(0.109)	(0.045)	(0.018)	(1.433)	(3.487)	(0.064)	(0.071)	(3.3e+04)	(1.0e+05)	(0.083)	(0.099)	(0.041)	(0.057)	(0.026)	(0.029)	(0.044)	(0.051)		
Treat × Landed	0.167	0.089	-0.050	0.038	-0.128	-0.038	0.137	0.015	-0.202	-0.217	-0.152	0.000	24.078	-5.210	0.147	0.049	1.4e+07	-3.6e+07	0.191	-0.142	0.038	-0.023	0.065	0.012	0.038	-0.043		
	(0.073)	(0.086)	(0.051)	(0.041)	(0.132)	(0.130)	(0.110)	(0.084)	(0.150)	(0.126)	(0.117)	(0.078)	(16.700)	(5.230)	(0.149)	(0.099)	(1.2e+07)	(3.2e+07)	(0.116)	(0.112)	(0.092)	(0.095)	(0.034)	(0.037)	(0.079)	(0.084)		
Treat × Related LL	0.158	-0.027	-0.034	0.052	-0.042	0.006	-0.002	0.180	0.156	0.170	0.191	-0.009	7.303	-3.523	-0.017	-0.071	1.1e+05	-5.3e+04	0.046	0.085	0.004	-0.079	-0.084	-0.017	-0.115	-0.033		
	(0.127)	(0.161)	(0.037)	(0.043)	(0.192)	(0.183)	(0.114)	(0.131)	(0.147)	(0.146)	(0.191)	(0.008)	(8.697)	(8.908)	(0.109)	(0.133)	(9.7e+04)	(1.3e+05)	(0.149)	(0.188)	(0.181)	(0.109)	(0.070)	(0.063)	(0.138)	(0.131)		
Treat × Don't know LL	0.057	-0.018	0.001	0.021	-0.037	-0.012	0.015	-0.094	-0.238	0.004	-0.027	-0.022	1.331	-2.053	0.102	-0.012	1.2e+07	-3.1e+07	0.106	-0.068	0.018	-0.089	0.032	-0.050	0.018	-0.128		
	(0.060)	(0.083)	(0.012)	(0.018)	(0.079)	(0.090)	(0.070)	(0.070)	(0.091)	(0.102)	(0.062)	(0.022)	(1.816)	(1.988)	(0.069)	(0.075)	(1.1e+07)	(2.9e+07)	(0.086)	(0.089)	(0.053)	(0.063)	(0.036)	(0.038)	(0.057)	(0.052)		
Obs.	3981	2875	3987	2880	3341	2468	3336	2465	3333	2465	1143	868	3335	2463	3101	2269	2356	1706	3962	2861	3255	2384	3997	2884	3997	2884		

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 53: Tenure security risks of fallowing land

	Fallowed in last 5 yrs		Years fallow in past 7 yrs		Fallow risk >50%		Fallow risk (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT
DiD-treat					0.074*	-0.047	0.051	-0.047
					(0.043)	(0.038)	(0.032)	(0.030)
CS-treat	0.001	-0.001	0.064	-0.363				
	(0.015)	(0.017)	(0.296)	(0.405)				
Treat × F head	0.044*	0.005	0.929**	0.443	0.097	-0.099	0.072	-0.092
	(0.023)	(0.029)	(0.449)	(1.097)	(0.070)	(0.089)	(0.053)	(0.071)
Treat × Young head	-0.005	-0.032	0.072	0.177	0.013	-0.104	0.008	-0.092
	(0.036)	(0.034)	(0.525)	(0.746)	(0.088)	(0.076)	(0.067)	(0.058)
Treat × Landed	0.017	0.042	0.714	-0.455	0.172*	-0.074	0.136	-0.030
	(0.054)	(0.043)	(0.442)	(0.727)	(0.101)	(0.098)	(0.085)	(0.080)
Treat × Related LL	-0.065	-0.064*	0.889	-0.667	0.031	-0.082	0.028	-0.064
	(0.046)	(0.034)	(0.713)	(0.413)	(0.114)	(0.139)	(0.082)	(0.101)
Treat × Don't know LL	0.024	0.033	0.994	-0.054	0.102	-0.051	0.066	-0.054
	(0.032)	(0.046)	(0.617)	(0.062)	(0.074)	(0.077)	(0.053)	(0.056)
.	1,849	1,339	182	120	3,357	2,775	3,357	2,775

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 54: Perceived risks of land conflict

	Fear of conflict, next 5 yrs		Concern over dispute risk		Dispute likelihood >50%		Dispute likelihood (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ITT	ATT	ITT	ATT	ITT	ATT	ITT	ATT
CS-treat	0.003	-0.036	0.003	-0.029	0.069**	-0.032	0.054***	-0.019
	(0.033)	(0.033)	(0.033)	(0.037)	(0.030)	(0.031)	(0.020)	(0.020)
Treat × F head	0.118**	0.036	0.129**	0.041	0.136***	0.008	0.085**	-0.008
	(0.049)	(0.053)	(0.051)	(0.065)	(0.048)	(0.055)	(0.034)	(0.035)
Treat × Young head	-0.069	-0.036	-0.060	-0.033	-0.005	-0.085	0.016	-0.059
	(0.074)	(0.061)	(0.071)	(0.063)	(0.058)	(0.057)	(0.038)	(0.037)
Treat × Landed	0.166*	-0.040	0.065	-0.041	0.219***	0.036	0.195***	0.035
	(0.091)	(0.075)	(0.111)	(0.079)	(0.073)	(0.073)	(0.044)	(0.051)
Treat × Related LL	-0.016	-0.048	-0.003	-0.037	0.028	0.020	0.018	0.003
	(0.067)	(0.067)	(0.079)	(0.093)	(0.071)	(0.078)	(0.052)	(0.051)
Treat × Don't know LL	0.143***	0.016	0.133**	0.036	0.201***	-0.037	0.159***	0.003
	(0.051)	(0.062)	(0.063)	(0.073)	(0.053)	(0.058)	(0.035)	(0.039)
.	1,849	1,234	1,272	1,272	1,237	1,237	1,237	1,237

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 55: Perceived risks of losing parcel rights

	Landlord sells parcel, likely		Likely over next 5 years		Slight worry over next 5 years	
	(1) ITT	(2) ATT	(3) ITT	(4) ATT	(5) ITT	(6) ATT
CS-treat	0.011 (0.035)	-0.042 (0.033)	0.005 (0.032)	-0.022 (0.033)	0.027 (0.038)	-0.034 (0.039)
Treat × F head	0.059 (0.057)	-0.013 (0.056)	0.068 (0.054)	0.057 (0.058)	0.185*** (0.054)	0.070 (0.057)
Treat × Young head	0.040 (0.079)	-0.031 (0.065)	0.046 (0.062)	0.009 (0.070)	-0.059 (0.072)	-0.104 (0.069)
Treat × Landed	0.277*** (0.083)	-0.035 (0.086)	0.143 (0.091)	-0.021 (0.085)	0.152 (0.109)	0.001 (0.084)
Treat × Related LL	0.050 (0.070)	-0.081 (0.068)	0.007 (0.062)	-0.070 (0.067)	0.035 (0.089)	0.039 (0.094)
Treat × Don't know LL	0.043 (0.056)	-0.054 (0.062)	0.091* (0.055)	0.060 (0.058)	0.152** (0.062)	-0.021 (0.068)
.	1,221	1,221	1,233	1,233	1,239	1,239

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$