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IMPACT EVALUATION OF THE FEED THE FUTURE TANZANIA LAND TENURE ASSISTANCE ACTIVITY

ENDLINE EVALUATION REPORT

JANUARY 2021

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IMPACT EVALUATION OF THE FEED THE FUTURE TANZANIA LAND TENURE ASSISTANCE ACTIVITY ENDLINE EVALUATION REPORT

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Prepared by:

Dr. Lauren Persha (Principal Investigator, NORC at the University of Chicago)
Jacob Patterson-Stein (Evaluation Coordinator, Management Systems International)

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ABSTRACT

This impact evaluation examined USAID's Land Tenure Assistance (LTA) activity, which was implemented in Iringa District, Tanzania from 2015 to 2019. LTA assisted in land use planning and delivering formalized documentation of customary rights to village residents, known as Certificates of Customary Rights of Occupancy (CCROs), through the use of the Mobile Application to Secure Tenure application. The evaluation randomized treatment assignment across 60 villages, with half receiving LTA's activities. The five evaluation questions cover the following household outcomes: documentation and tenure security, land disputes, land use and investment, empowerment, and economic wellbeing.

The evaluation team conducted data collection via a panel survey of 1,361 households over three stages (two baseline phases, an interim midline phase for a subset of households, and an endline phase). The evaluation found that within three years of CCRO receipt, LTA had a large and significant positive impact on household tenure security and documentation of land rights, reduced the likelihood of current and future land disputes, and had a smaller positive impact on use of communal land. LTA did not appear to impact the likelihood of fallowing, crop diversification, household land investments, access to credit, or other indicators of household economic wellbeing during that timeframe. Qualitatively, results suggested tangible and important improvements to women's empowerment, including women's increased access to land resources and tenure security. The evaluation results help confirm aspects of LTA's theory of change and align with literature on the impacts of customary land rights formalization on tenure security and other shorter-term outcomes along the envisioned causal pathways. However, the results also highlight a need to revisit expectations for the time required to achieve downstream impacts in rural smallholder settings as a result of customary land formalization on its own. The lack of downstream impacts related to land investments, agricultural productivity, diversification, and broader economic wellbeing highlight the need for USAID to consider coupling or synchronizing future CCRO provisioning programs with agricultural extension and market linkages support to villagers within identified value chains, and financial literacy, financial services, and business development support, once CCROs are obtained.

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ACRONYMS

A-WEAI	Abbreviated Women's Empowerment in Agriculture Index
ANCOVA	Analysis of Covariance
CCRO	Certificate of Customary Right of Occupancy
CDO	Community Development Officer
DLO	District Land Office
E3	Bureau for Economic Growth, Education, and Environment (USAID)
FTF	Feed the Future
GOT	Government of Tanzania
HH	Household
IE	Impact Evaluation
ITT	Intent to Treat
KII	Key Informant Interview
LTA	Land Tenure Assistance
LU	Office of Land and Urban (USAID/E3)
MAST	Mobile Application to Secure Tenure
MOL	Ministry of Lands
MSI	Management Systems International
NGO	Non-Governmental Organization
OR	Odd Ratio
RCT	Randomized Controlled Trial
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SOW	Statement of Work
TZS	Tanzanian Shillings
VLUP	Village Land Use Plan
USAID	United States Agency for International Development
VICOBA	Village Community Bank
WEAI	Women's Empowerment in Agriculture Index
WMA	Wildlife Management Area
WTP	Willingness to Pay

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EXECUTIVE SUMMARY

This report presents results of an impact evaluation (IE) of the Feed the Future Tanzania Land Tenure Assistance (LTA) activity. The Office of Land and Urban in the United States Agency for International Development's Bureau for Economic Growth, Education, and Environment (USAID/E3) commissioned the evaluation. The evaluation used a two-phase randomized controlled trial design to rigorously test how mobile mapping and facilitation of formalized customary land tenure certification affect household tenure security, land disputes, investment, women's empowerment, longer-term economic wellbeing, and related land use and management issues in Iringa District, Tanzania. This report provides impact estimates at endline on key indicators and descriptive qualitative findings related to five evaluation questions, two to two-and-a-half years after household land mapping and receipt of formalized customary land documentation via Certificates of Customary Right of Occupancy (CCROs).

LTA ACTIVITY DESCRIPTION

In recent decades, Tanzania and many other countries across sub-Saharan Africa have undertaken substantial land reforms to formalize customary land rights for village residents, aiming to improve tenure security and unlock economic opportunities for the rural poor. The Tanzanian land rights system is based on public ownership of land, wherein all land is owned by the state and held in trust by the president. Individuals who use or occupy village land have the right to obtain formal documentation of their customary land use rights via a legally valid and transferrable CCRO, which is issued by the local government. However, factors such as insufficient capacity of district land offices (DLOs) to assist villages with land use planning or issue CCROs, villagers' unfamiliarity with formal land laws, and lack of funds to pay CCRO fees have resulted in few villagers obtaining formal documentation of their land rights and CCROs for their plots. Increasingly, the Government of Tanzania and the donor community recognize that improving the security of land rights is essential to protecting the rights of smallholders, reducing land disputes, and maximizing the region's economic potential.

USAID/Tanzania awarded the four-year, \$6 million LTA activity to DAI in December 2015. The activity sought to clarify and document land ownership, support local land use planning efforts, and increase local understanding of land use and land rights in Tanzania. LTA assisted villages and the DLOs in Iringa and Mbeya districts in completing the land use planning process and delivering CCROs in select villages. It also provided education on land laws, CCROs, and land management. LTA used the Mobile Application to Secure Tenure (MAST), a USAID-developed app and approach that facilitates the land mapping and customary land formalization process. The 2015-2019 phase of LTA in Iringa District was implemented in 36 villages, 6 of which were chosen for initial implementation and an additional 30 were part of this evaluation. According to LTA implementation tracking data, the activity registered 59,354 CCROs in Iringa District villages during that time, of which 51,222 CCROs were collected by 26,436 individual claimants.

EVALUATION QUESTIONS

The IE addressed five evaluation questions (EQs) related to key aspects of LTA's theory of change (Table I).

TABLE 1: THEMATIC AREAS OF INVESTIGATION AND EVALUATION QUESTIONS

Thematic Area	Evaluation Question
Tenure security and land management	1. In what ways and to what extent do landholders who have received formal land documentation through the assistance of LTA perceive their land rights to be more secure?
Land disputes	2. To what extent are landholders who have received formal land documentation through the assistance of LTA less likely to experience land disputes? 2.1 What kinds of disputes (if any) are affected and what are the mechanisms by which LTA affects them?
Investment and land use	3. To what extent do landholders who have received formal land documentation through the assistance of LTA change their investment and land use decisions in a manner that reflects strengthened incentives resulting from increased tenure security? 3.1 What (if any) are the specific decisions that are affected and how does LTA influence them?
Empowerment	4. To what extent do the LTA outreach and communication activities, as well as mapping, verification, and the formal registration of land, lead to a greater sense of empowerment on the part of women, youth, and pastoralists? 4.1 What (if any) are the specific aspects of empowerment that are affected and how does LTA influence them?
Economic and environmental outcomes	5. To what extent do the LTA interventions to strengthen land tenure lead to increased agricultural productivity, household income, and wealth, as well as more environmentally sustainable land-use practices and associated environmental benefits? 5.1 Which (if any) of these outcomes are affected and how does LTA influence them?

EVALUATION DESIGN

The IE used a household panel dataset to assess the impacts of LTA's combined sensitization, mapping, verification, land registration, and other village-level activities related to CCRO provisioning on select household outcomes for four of the five thematic areas. The IE used a cluster randomized design whereby Iringa District villages were randomly assigned to receive the LTA activity (30 villages) or serve as control villages (30 villages). The assignment of villages into treatment or control groups, baseline data collection for the IE, and the start of LTA implementation in the 30 treatment villages took place in 2 phases: an initial set of 15 randomly selected villages in March 2017, followed by a second set of 15 randomly chosen villages beginning in September 2017. The second implementation phase was accelerated from the initial IE design by approximately six months to accommodate LTA's schedule. As a result, the second round of IE data collection that took place in phase I baseline villages served primarily as a check on implementation fidelity rather than a true midline given the short six-month timeframe between those data collection rounds. The third data collection round took place at endline in March 2020, approximately 18-36 months after intervention activities, across all LTA and control villages.

At each baseline round, the IE team conducted a household survey of a random sample of households in each village prior to each LTA implementation phase. The survey aimed to interview the head and primary spouse of each household, where available, and again at endline. The endline sample size was 2,243 respondents across 1,361 households (1,079 respondents from 651 LTA households and 1,164 from 710 control households). At endline, 209 households were not able to be interviewed from the initial baseline sample of 1,570 households, corresponding to an attrition rate of 13.3 percent. This level of attrition did not bias the impact estimates and was within the 15 percent range planned at the design stage. The IE design originally included focus group discussions and key informant interviews at endline in a subset of LTA and control group villages, along with local village- and district-level authorities, in particular to address the evaluation question related to empowerment. However, this qualitative data collection could not be conducted as initially planned because of travel restrictions due to the COVID-19 pandemic starting in March 2020.

KEY FINDINGS AND CONCLUSIONS

Table 2 summarizes the main findings and conclusions for each evaluation question.

TABLE 2: SUMMARY OF KEY FINDINGS AND CONCLUSIONS BY EVALUATION QUESTION

Key Findings	Conclusions
EQ1: Tenure Security and Land Management	
<ul style="list-style-type: none"> LTA's systematic village-wide support for CCRO issuance increased the likelihood that a household would have a CCRO by about 100 percent relative to the control group, which reflects LTA's strong achievement of widespread CCRO provisioning in LTA villages. LTA was positively correlated with increasing the willingness to pay for CCROs among treatment households, but this finding is not statistically significant and is sensitive to model specification. LTA appears to have positively influenced concerns about land expropriation within communities, resulting in a 18 percent decrease on average in a household's probability of expressing community-wide concern over land expropriation in their community. Controlling for context factors, LTA led to a 16 percent decrease on average in a household's probability of feeling tenure insecure. LTA did not appear to influence perceptions about the risk of losing land that is left fallow. Self-reported familiarity with land laws increased across both assignment groups, with no significant effect from LTA, controlling for other factors. 	<p>LTA's CCRO provisioning had a positive impact on one of the earliest steps along the envisioned causal pathway for customary land formalization: strengthening landholders land rights, possession of formalized land documentation, and perceived land tenure security. Around two to two-and-a-half years after household receipt of formalized customary land documentation, the IE found fairly strong evidence for landholders' increased tenure security, which is expected to help lay the foundation for them to make sustainable agricultural investments on their land.</p>
EQ2: Land Disputes	
<ul style="list-style-type: none"> The percentage of households reporting a land dispute fell across both assignment groups, but LTA households experienced a sharper decline. LTA households reported shorter disputes on average than control group households, but there is also higher variation in the reported dispute length among control group households at endline, with no statistically significant impact attributable to LTA. The most commonly reported land dispute types—competing claims over land and boundary disputes over land already held—did not change over time, irrespective of assignment group. LTA households were less concerned on average about future boundary disputes than control households, relative to baseline. LTA activities are estimated to have reduced the probability that respondents felt they could experience a boundary dispute in the next 5 years by 32 percent. CCRO documentation via LTA appears to have changed whether and why households think about future dispute risk. By endline, 66 percent of LTA households that were not worried about future boundary disputes said it was because their household had documentation of land rights. 	<p>LTA's CCRO provisioning reduced the likelihood that treatment households experienced a land dispute in the six months prior to endline, as well as their perceived risk of experiencing a land dispute in the future. Qualitative findings suggested this improved outlook about future land disputes could also have been bolstered by the DLO's increased capacity to respond to and mediate disputes that was gained through LTA's support.</p> <p>However, the IE did not find evidence that LTA changed the nature of land disputes that households typically experience or the time it may take for such disputes to be resolved. Future disputes will likely center on four issues: competing claims to land by members of the same community, boundary disputes among neighbors, widow's land rights, and inheritance disputes among siblings.</p>

Key Findings	Conclusions
EQ3: Investment and Land Use	
<ul style="list-style-type: none"> Land-based investments or productivity-enhancing improvements increased between baseline and endline across both assignment groups. There was no evidence, however, of an increase in land-based investments due to LTA's CCRO provisioning. Fertilizer use increased across both assignment groups, from 52 percent of households at baseline to 75 percent for LTA households and 72 percent for control households at endline. However, there was no evidence of an increase in fertilizer use due to LTA's CCRO provisioning. Impact analysis found that there was a slight increase in household planting of tree crops across assignment groups, with a larger increase of LTA households (21 to 26 percent) reporting tree planting. The percentage of households that reported following any parcels did not change between baseline and endline across both assignment groups. The number of crops planted by households increased across both assignment groups between baseline and endline. There was no evidence that LTA's CCRO provisioning had an effect on this. There was no evidence that LTA's CCRO provisioning had an effect on the number of parcels or total land holdings reported. Use of communal land increased between baseline and endline across both assignment groups, but the increase was larger for LTA villages (29 percent at baseline to 37 percent at endline). 	<p>There is little evidence to date that households' improved tenure security and possession of formalized land documentation has spurred them to make new or different investments into their land – or at least not at sufficient magnitude to be detectable through this IE, which was not powered to detect small impacts that were considered unlikely to be of interest from a policy perspective.</p> <p>The endline qualitative data highlighted that while CCRO provisioning is viewed as essential to lay the foundation for farmer land investments, broader farming and market constraints will also likely need to be addressed before landholders in the LTA context can do so effectively.</p> <p>As with many land formalization studies, the LTA IE results on land investments highlight a need to collect additional data more than two years after receipt of formalized land documentation, to better understand the longer-term effects.</p>
EQ4: Empowerment	
<ul style="list-style-type: none"> At endline, 83 percent of female primary spouses in LTA villages (n=353) reported possession of a CCRO, compared to only 13 percent of primary spouses in the control group (n=57). Results on CCRO possession by female household heads were similar; 88 percent of female household heads in LTA villages (n=165) reported having a CCRO, compared to 10 percent of female-headed households in the control group (n=23). The IE results suggested a decline in female primary spouses' perceived tenure insecurity during LTA, both from LTA and control group households. There was an increasing trend in male-led decision making in the household during LTA across both assignment groups. There was no evidence LTA had an effect on this change. Women's participation in food crop farming was high, followed by minor household expenditures, livestock raising, cash crop farming, and major household expenditures. A large proportion of female primary spouses typically felt they had at least some input into decision making across the four main productive activities, where they participated in them, and this changed little across survey rounds. There was no evidence LTA had an effect on this. The large majority of female primary spouses were already exercising some input into decisions on the use of income at baseline, and there was little substantive change on this during LTA. 	<p>LTA's CCRO provisioning and other activities in villages led to some tangible and important improvements in women's empowerment.</p> <p>LTA clearly led to a strong positive increase in the proportion of women with legally documented and formalized customary land rights, and this held across both female household heads and female primary spouses. Moreover, results suggests tenure security improved for female household heads and wives. On both issues, the magnitude of improvement was generally on par with that observed for male household heads in LTA villages.</p>

Key Findings	Conclusions
<ul style="list-style-type: none"> There was no evidence that LTA's CCRO provisioning activities had an effect on women's comfort speaking in group settings. 	
EQ5: Economic and Environmental Outcomes	
<ul style="list-style-type: none"> Farm earnings for LTA households increased between baseline and endline, with both male- and female-headed LTA households experiencing an increase in income from annual crop sales between baseline and endline. There was a negligible change in the proportion of households that reported borrowing among both LTA and control group households, staying fairly stable at 12 and 13 percent of households by endline, respectively. Wives' borrowing also experienced little change, staying at 21 percent for LTA households and 22 percent of control group households for both survey rounds. The median amount borrowed increased across both LTA and control group villages between baseline and endline. It is likely too soon for LTA's activities to have influenced households' agricultural productivity or income to a level that would affect their food security, but there was an overall increase in food security across households in both assignment groups. LTA has not yet increased the rate of borrowing from formal banks. Neighbors or friends were the largest source of financial borrowing across each survey round and assignment group. Use of CCROs in the borrowing process was uncommon by endline, but had occurred for a few households. 	<p>Given the lack of evidence for a substantial change in land investments, it may not be surprising that the IE also found little evidence for an effect of CCRO provisioning on farm earnings or other indicators of changes to agricultural productivity. There was also no evidence of a significant impact of LTA's CCRO provisioning on household food security at this stage, although food security did increase among both LTA and control group households during LTA and a decline in the proportion of households experiencing moderate hunger was observed. The IE's findings of a lack of evidence for impact on farm earnings and credit access is also consistent with much of the existing literature on customary land formalization, which also found little evidence for an effect of strengthened tenure security on household income or economic wellbeing.</p> <p>Formalized land rights are clearly an important step in unlocking formal sources of credit and economic opportunities for the rural poor, but the IE's qualitative findings show that substantial demand- and supply-side barriers may also need to be addressed before this can be realized at scale. These include farmer financial literacy and knowledge about loan processes and products, business skills and ability to utilize a loan for profitable activities, and working with banks to clarify procedures and develop appropriate lending products for rural smallholder farmers.</p>

RECOMMENDATIONS

Based on the IE's findings and conclusions, the evaluation team proposes the following recommendations:

CUSTOMARY LAND FORMALIZATION PROGRAM DESIGN

USAID, LTA, and future implementing partners should:

- Extend LTA to control group villages and all remaining eligible villages in Iringa District. Also, consider possibilities for expanding the activity or the model of support to DLOs to other districts in the Southern Agricultural Growth Corridor of Tanzania (SAGCOT).¹
- Consider coupling or synchronizing future CCRO provisioning programs with complementary: (1) targeted agricultural extension and market linkages support to villagers within identified value chains, and (2) financial literacy, financial services, and business development support once the CCROs are obtained.
- Provide targeted support to address key demand and supply constraints on lending for CCRO recipients, whether through formal or informal lenders.
- Adapt targeted trainings and information dissemination on land rights to ensure coverage across all key subgroups, including female household heads.
- Ensure a clear grievance system is in place for villagers and develop a system to track and potentially assist households that may experience de facto land dispossession through the land formalization process.

LEARNING FROM CUSTOMARY LAND FORMALIZATION EVALUATIONS

USAID should:

- Revisit key facilitating conditions in the customary land formalization theory of change and update expectations regarding the time that is likely needed to achieve downstream impacts after improved land access and tenure security have been achieved.
- To enhance learning on how facilitating conditions might help customary landholders better leverage their CCRO for sustainable agricultural and economic gains, consider targeted studies on key linking issues across the land formalization and tenure strengthening theory of change.
- Consider expanding the scope of future IEs to address questions related to village-level land use planning and governance processes, in addition to household-level effects from CCRO provisioning.
- To strengthen the overall knowledge base on how customary land formalization may help improve livelihoods for the rural poor, under what conditions, and in what timeframes, continue to prioritize randomized controlled trial approaches to evidence-based learning on customary land formalization projects.

¹ LTA registered as an independent NGO in late 2020, aiming to transition its activities to the NGO by end of 2021 including scaling up its work in Iringa and extending it to at least two other SAGCOT districts.

INTRODUCTION

This endline report presents results of an impact evaluation (IE) of the Feed the Future Tanzania Land Tenure Assistance (LTA) activity. The Office of Land and Urban in the United States Agency for International Development's Bureau for Economic Growth, Education, and Environment (USAID/E3/LU) commissioned the evaluation. The E3 Analytics and Evaluation Project² designed and implemented the evaluation. The evaluation used a randomized controlled trial (RCT) design to test how mobile mapping and facilitation of customary land tenure certification affect household tenure security, land disputes, investment, empowerment, longer-term economic wellbeing, and related land use and management issues in Iringa District, Tanzania. The evaluation results contribute to a growing body of evidence to inform donor, implementer, and government interests around low-cost, scalable, and sustainable approaches to achieving land formalization goals and related development objectives. Annex A provides USAID's statement of work (SOW) for the evaluation.

This report provides findings on the impacts of the LTA activity 18-36 months after household land mapping and receipt of formalized customary land documentation via Certificates of Customary Right of Occupancy (CCROs). The endline report follows previous reports on the Phase I and Phase II baselines, which provided descriptive measures of key outcome variables across treatment and control group villages; and a Phase II midline report, which summarized interim differences between assignment groups for 15 LTA treatment and 15 control group villages 6 months after receipt of CCROs in the Phase I treatment villages. This endline report:

- Describes and summarizes findings for endline survey data collection;
- Compares endline data to previous rounds of descriptive analysis;
- Provides causal statistical inference estimates of LTA's impact on the main outcome variables;
- Integrates findings from remote qualitative data collection conducted at endline; and
- Provides overall conclusions and recommendations related to each evaluation question.

LTA ACTIVITY BACKGROUND

TANZANIAN LAND CONTEXT

In many countries, the lack of formally documented land ownership, unclear parcel boundaries, and inequitable land-use rights are potential constraints to economic growth. Vulnerable populations may be further marginalized in contexts where unclear land rights are a source of local disputes or influence household decision making. In rural areas of Tanzania, as in many other low-income countries, land is a crucial productive asset that supports rural livelihoods and enables individuals and households to expand their economic opportunities.

In recent decades, Tanzania and many other countries across sub-Saharan Africa have undertaken substantial land reforms to formalize customary land rights for village residents, with an aim to improve tenure security and unlock economic opportunities for the rural poor. The Tanzanian land rights system is based on public ownership of land, wherein all land is owned by the state and held in trust by the president. Roughly 70 percent of land in Tanzania is designated as village land, which is governed by the 1999 Village Land Act. An estimated 75 percent of the country's population lives on village land (Massay 2016). The Act introduced sweeping land reforms and protections for customary land use rights, including recognition of villages' rights to hold and administer land according to customary law. Individuals who use or occupy village land have the right to obtain formal

² Management Systems International (MSI) implements the E3 Analytics and Evaluation Project in partnership with Palladium and NORC at the University of Chicago.

documentation of their customary land-use rights via a legally valid and transferrable CCRO, which is issued by local government.³

In practice, however, implementation of customary land use protections under the Village Land Act has been slow. Nearly two decades after Act's passage, surveys show that most Tanzanian villagers do not have CCROs and lack formal documentation of their land rights (Pederson 2010; Stein et al. 2016; Genicott and Hernandez 2019). In many villages, the land use demarcation and mapping of village lands and the creation and passage of village land use plans (VLUPs) – the precursor steps to CCRO provisioning – have not been completed. Even where VLUPs are in place, systematic mapping and demarcation of customary landholders' individual parcels have generally not occurred at scale, except through donor projects. Instead, individual villagers with sufficient resources may request CCROs from district land offices (DLOs) through a costly and demand-driven process. The DLOs responsible for issuing CCROs frequently lack the capacity to do so, and rural land users are often unaware of their land rights under the law.

These land sector legal reforms and implementation challenges are juxtaposed with increasing land pressures in the country, particularly in the regions that comprise the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) where LTA is implemented. Moreover, the impacts of a changing climate and associated agricultural hardships, population growth, and the seasonal movements of pastoralist communities in the region cause additional tensions over land and give rise to several types of disputes that cross a range of geographic scales (Mwamfupe 2015). In addition, large-scale agricultural investments are increasing in the SAGCOT area, potentially contributing to additional smallholder insecurity due to weak land rights protection and limited bargaining power (Deininger 2011). There is growing interest by Government of Tanzania and the donor community to generate learning on the extent to which customary land formalization may be a key way to improve the security of land rights in village contexts, which in turn is essential for protecting smallholders' rights, reducing land disputes and tensions, and maximizing the region's economic potential.

Learning from customary land reforms in Tanzania and across sub-Saharan Africa through rigorous IEs has begun to provide evidence on the effects of customary land formalization on a range of outcomes. In the Tanzanian context, the CCRO provides legal documentation of the land user's customary rights and clarifies the boundaries of the parcels. This is expected to increase land users' tenure security and incentivize land holders to make productivity-enhancing investments or otherwise change how they use land in ways that will add land value or increase agricultural productivity and eventually improve their economic situation. A second way in which the CCRO may help to improve households' economic wellbeing is by enabling the landholder to access more formalized sources of credit and in larger amounts, through the use of the CCRO as collateral for a loan or potentially through other channels. In this vein, the CCRO has long been promoted in Tanzania as a gateway to credit and economic growth for rural households.⁴

LTA ACTIVITY DESCRIPTION

The LTA activity, which is a part of the U.S. government's Feed the Future initiative, was implemented through a four-year, \$6 million contract awarded by USAID/Tanzania to DAI in December 2015. LTA sought to clarify and document land ownership, support local land use planning, and increase local understanding of land use and land rights in Tanzania. LTA interventions aimed to increase land tenure security and lay the groundwork for sustainable agricultural investment for both smallholder farmers and commercial investors throughout the SAGCOT and in the value chains of focus for Tanzania's Feed the Future program. The activities this IE evaluated concluded at the end of 2019. A two-year LTA "follow-on" commenced in 2020 to scale up LTA

³ For more on Tanzania's land tenure system, see USAID Country Profile, "Land Tenure and Property Rights: Tanzania," at https://www.land-links.org/wp-content/uploads/2016/09/USAID_Land_Tenure_Tanzania_Country_Profile.pdf.

⁴ See Stein et al. 2016.

efforts across another 70 villages in Iringa District. Those follow-on activities are outside this IE's scope.

LTA consisted of two larger components (1 and 2) and two smaller components (3 and 4), as described below, with local sustainability a critical cross-cutting component. LTA aimed to empower district and village land institutions in targeted districts to carry forward land administration capacity development and the land administration process independently, with little or no outside financial support, once the activity concludes. LTA worked within the current land management bureaucracy and helped facilitate formal land certification and education through four overlapping components:

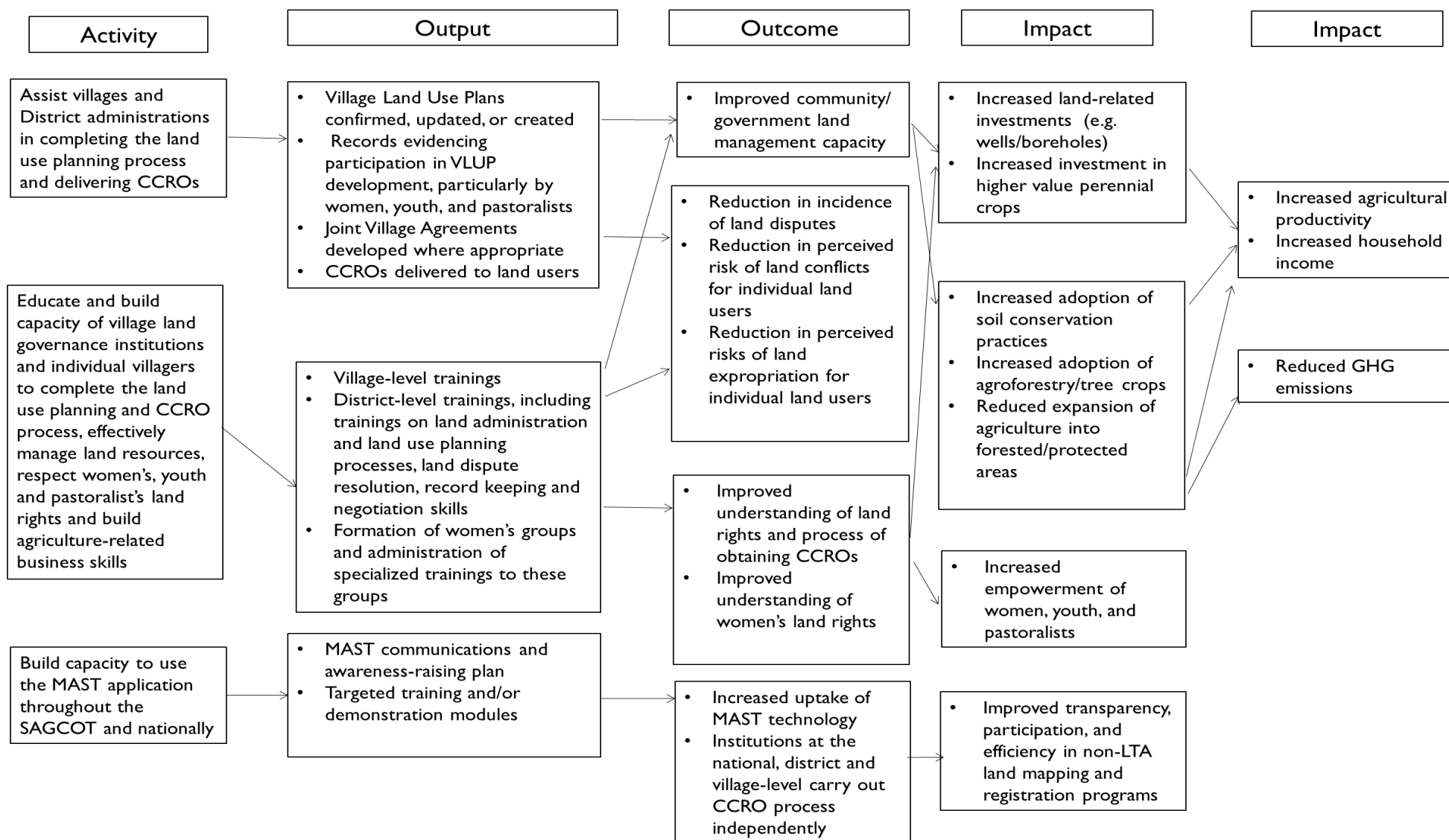
1. Assist villages and district administrations in completing the land use planning process and delivering CCROs in select villages within two districts (Iringa and Mbeya).⁵
2. Educate and develop the capacity of village land governance institutions and individual villagers to complete the land use planning and CCRO process; effectively manage land resources; respect the land rights of women, youth, and pastoralists; and build agriculture-related business skills.
3. Educate and develop the capacity of district-level land governance institutions in the Mbeya Region to complete the land use planning and CCRO process; effectively manage land resources; respect the land rights of women, youth, and pastoralists; and build agriculture-related business skills.
4. Develop capacity to use the Mobile Application to Secure Tenure (MAST) application throughout the SAGCOT and, nationally, to assist with tenure certification.

DEVELOPMENT HYPOTHESIS

USAID envisions that if LTA contributes to clarifying and documenting land ownership, supports land-use planning efforts, and increases local understanding of land use and land rights, then this will lead to increased agricultural investment, reduced land tenure risk, and more empowered people and local institutions. LTA components work in tandem to promote inclusive agricultural development, food security and investment, and institutional capacity. Figure 1 illustrates the causal linkages that USAID envisions for translating results under each component into LTA's intended intermediate and final outcomes.

⁵ While LTA was implemented in both Iringa and Mbeya Districts, the IE only took place in Iringa.

FIGURE 1: THEORY OF CHANGE FOR THE LTA ACTIVITY

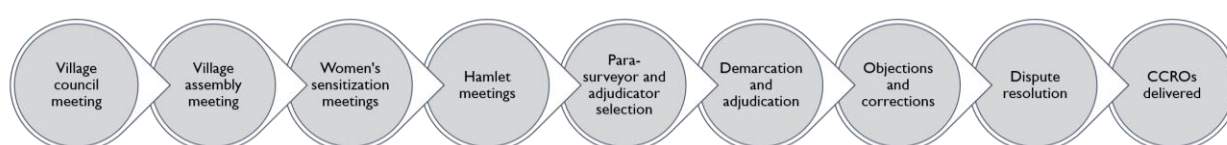


ACTIVITY IMPLEMENTATION STATUS

DAI began implementing LTA in late 2016 in six pilot villages in Iringa District (not included in this IE). Full-scale implementation in 15 Phase I villages began following baseline data collection for the IE in April 2017. A new DAI chief of party took over LTA in early 2017, which resulted in some adjustments to the implementation and evaluation approach. Phase II implementation in an additional 15 villages was originally planned to occur approximately 12 months after Phase I. However, due to LTA's concerns regarding target achievement, LTA amended the originally agreed schedule to begin work in Phase II villages six months earlier than initially planned. LTA implementation was completed in all 36 targeted villages in Iringa District (Phases I and II) by the end of 2018.

Figure 2 presents the LTA implementation stages. Each stage can require multiple teams working simultaneously and in coordination with local officials in villages and at the DLO.

FIGURE 2: LTA ACTIVITY IMPLEMENTATION PROCESS



LTA monitoring data suggests that around 94 percent of all parcels in LTA villages were registered through the implementation process. According to activity implementation tracking data, LTA registered 59,354 CCROs in Iringa District villages during 2016-2019, of which 51,222 CCROs were collected by 26,436 individual claimants. This translates to around 87 percent of registered claimants collecting their CCROs by the 2019 conclusion of LTA's initial phase.⁶

LTA also took steps to strengthen women's land rights and increase their economic opportunities through land registration and CCRO issuance. This included radio programming on women's land rights and gender equity and conducting trainings and women's group strengthening meetings on land laws and land administration, productive utilization of land, resource management, and agriculture-related business activities. LTA also advised women on the type of occupancy and tenancy arrangements that are best suited to protecting their land rights⁷ and the importance of women's participation in land demarcation, adjudication, and village assembly meetings that involve land issues.

In March 2019, LTA recorded a one-minute radio advertisement to highlight women's land rights and the LTA activity. These radio spots aired 15 times over 6 days to promote a 1-hour live radio show promoting women's land rights that featured LTA staff (2019 LTA annual report). This was the second radio program and advertisement activity that LTA staff implemented with local stations in Iringa in 2019 to promote LTA and highlight land rights.

LTA conducted 49 women's sensitization meetings across 41 Phase I villages and provided 83 women's group strengthening trainings for 220 women's groups.⁸ At the completion of LTA's 4 years, around 50 percent of CCRO claimants were women, with women comprising 48 percent of single occupancy claimants in the final year of implementation and 51 percent of joint tenancy claimants.

⁶ DAI. 2019. Feed the Future Land Tenure Assistance (LTA) Y4 FY19 Annual Report, pages 48-49.

⁷ For husbands and wives, LTA promoted co-occupancy as joint tenants for land registration and CCRO issuance.

⁸ LTA Sustainability Workplan, January 2020.

EVALUATION PURPOSE, AUDIENCES, AND USES

RCT approaches to assessing the impacts of land formalization and documentation are exceedingly uncommon in the land sector. Among the growing evidence base, results have found mixed evidence for the shorter- and longer-term effects that are anticipated according to the sector's broad theory of change. For example, while some studies of customary land formalization have pointed to positive impacts on tenure security,⁹ a recent systematic review of the effects of increased land tenure security across 59 rigorous studies (of which 2 were RCTs) found generally supportive evidence for positive impacts on productivity-enhancing agricultural investments and on female empowerment, but not for agricultural productivity, access to credit, or income.¹⁰

PURPOSE AND USES

The purpose of this IE is to provide USAID with evidence on the impacts of its LTA investment. The IE was also designed to contribute to the evidence base on the impacts of customary land mapping, registration, and formalization in rural smallholder settings in Tanzania. This IE will inform the design of future donor and government activities that aim to improve tenure security and generate economic benefits by strengthening land rights.

AUDIENCE

The IE is aimed at several audiences. The findings are expected to be of value, from an accountability and learning standpoint, to USAID/E3/LU, USAID/E3's Office of Global Climate Change, and the Tanzania Mission. Findings and lessons learned will also be of interest to the Government of Tanzania and the donor community active in the land tenure sector, together with DAI and other practitioners working to document customary land rights. The IE will also be relevant to donors involved in next generation formalized land documentation efforts, such as those involved with the Land Tenure Support Program in Tanzania, a large-scale effort funded jointly by the United Kingdom, the Swedish International Development Cooperation Agency, and the Danish International Development Agency, as well as implementers and the broader land sector community that follows and draws on contributions to the evidence base on customary land documentation and related land tenure strengthening interventions.

EVALUATION QUESTIONS

The evaluation team developed and finalized five broad evaluation questions (EQs) in collaboration with USAID/E3/LU that were designed to address key aspects of the LTA theory of change (Table 3).¹¹

⁹ For example, see Deininger, K., D. Ali, T. Alemu. 2011. Impacts of Land Certification on Tenure Security, Investment, and Land Market Participation: Evidence from Ethiopia. *Land Economics* 87(2):312-334; Goldstein, M., Hounghbedji, K., Kondylis, F., O'Sullivan, M., & Selod, H. 2018. Formalization without certification? Experimental evidence on property rights and investment. *Journal of Development Economics*, 132, 57-74.

¹⁰ Higgins, D., Balint, T., Liversage, H., and P. Winters. 2018. Investigating the impacts of increased rural land tenure security: a systematic review of the evidence. *Journal of Rural Studies*. 61:34-62.

¹¹ These evaluation questions were revised after the SOW provided in Annex A was prepared. These changes were approved by USAID as part of the evaluation design proposal submitted to USAID in 2016.

TABLE 3: THEMATIC AREAS OF INVESTIGATION AND EVALUATION QUESTIONS

Thematic Area	Evaluation Question
Tenure security and land management	1. In what ways and to what extent do landholders who have received formal land documentation through the assistance of LTA perceive their land rights to be more secure?
Land disputes	2. To what extent are landholders who have received formal land documentation through the assistance of LTA less likely to experience land disputes? 2.1 What kinds of disputes (if any) are affected and what are the mechanisms by which LTA affects them?
Investment and land use	3. To what extent do landholders who have received formal land documentation through the assistance of LTA change their investment and land use decisions in a manner that reflects strengthened incentives resulting from increased tenure security? 3.1 What (if any) are the specific decisions that are affected and how does LTA influence them?
Empowerment	4. To what extent do the LTA outreach and communication activities, as well as mapping, verification, and the formal registration of land, lead to a greater sense of empowerment on the part of women, youth, and pastoralists? 4.1 What (if any) are the specific aspects of empowerment that are affected and how does LTA influence them?
Economic and environmental outcomes¹²	5. To what extent do the LTA interventions to strengthen land tenure lead to increased agricultural productivity, household income, and wealth, as well as more environmentally sustainable land-use practices and associated environmental benefits? 5.1 Which (if any) of these outcomes are affected and how does LTA influence them?

EVALUATION DESIGN

THEORY OF CHANGE

Figure 1 illustrates the causal linkages that USAID envisions for translating results under each main LTA component¹³ into the activity's intended intermediate and final outcomes. By contributing to CCRO issuance to land users, as well as education on land laws and capacity building, LTA will help improve tenure security and reduce incidence of land disputes among households. These outcomes will, in theory, spur increased investment in agriculture, as land users change their behavior in response to stronger incentives brought about by improved security. USAID expects that women, youth, and pastoralists who receive a CCRO will experience greater empowerment, which should also result more broadly from LTA outreach and education on land laws that protect the rights of women, youth, and pastoralists. USAID anticipates that the development of VLUPs, as well as some of the trainings for village and district officials, will improve the capacity of village and government institutions to manage land resources.¹⁴ Finally, LTA activities to raise awareness about MAST and build capacity to use it within the Government of Tanzania and the donor community should result in greater uptake of the MAST technology in future land mapping and registration projects. This would encourage more transparent, participatory, and efficient processes to issue CCROs.

The IE focused on measuring LTA's impacts on direct LTA beneficiaries through CCRO issuance and outreach, land administration capacity building, and education components (i.e., the first two

¹² Economic and environmental outcomes covered in EQ5 are expected to unfold over a period that exceeds the IE timeframe. As a result, the IE team cautions that LTA's impact on these outcomes may not be observable over the IE's timeframe. This endline analysis provides a preliminary indication of impacts for EQ5. A more comprehensive assessment would require an additional data collection round a few years past the endline.

¹³ Figure 1 does not show LTA activities specific only to Mbeya District, because this IE focuses solely on LTA activities in Iringa District. This theory of change diagram has been updated since the SOW in Annex A, with USAID's approval.

¹⁴ This includes identifying and maintaining protected areas, establishing or strengthening the management of communal forest areas or woodlots, limiting excessive expansion of areas under cultivation, and implementing other environmental management practices or sustainable land uses within villages.

“activity” boxes in Figure 2). The last benefit stream in Figure 2 is beyond the IE’s scope because assessing the extent to which other efforts to issue CCROs have taken up the MAST technology, either within SAGCOT or nationally, would require different data sources, methods, and timeframe to observe results.

EVALUATION DESIGN OVERVIEW

The IE used a clustered RCT design to assign villages to treatment and construct the control group. Prior to the start of LTA implementation in Iringa District, the IE team worked with LTA staff and district officials to randomly assign each eligible village to either receive LTA or not. Villages that were randomly selected not to receive LTA served as the control group. The IE measured LTA’s impacts on activity beneficiaries across 30 randomly assigned treatment villages¹⁵ in Iringa District, which represented LTA’s implementation capacity at the time of the IE design. The assignment of villages into treatment or control groups took place in two phases during 2017, during a time when several villages in the district were subdividing and splitting into multiple smaller villages as their populations increased. To ensure as accurate a village list as possible, the IE team in partnership with DAI randomized village assignment to LTA in two phases, which took place in March 2017 and September 2017.^{16,17} In each phase, 15 villages from the overall eligible village list were randomly assigned to LTA and 15 were randomly assigned to serve as control group villages, for a total of 30 villages assigned into the treatment or control groups per phase. Villages were sourced using a list of 75 eligible villages from the Iringa DLO.^{18,19} In addition, the IE team selected 4 “reserve” villages to be included in IE data collection and available for LTA implementation should LTA encounter difficulties in any of the initial pool of 30 villages assigned to receive LTA.²⁰ Adjustments to the original design, notably the timeline, were made to accommodate DAI’s implementation schedule (Annex D provides more information on these adjustments).

¹⁵ The number of villages in the study is determined by the size of the activity. In 2016, LTA began implementing in a preliminary set of non-randomly selected villages in Iringa, and also implemented in five test villages in Mbeya. These villages were not included in the IE. The 30 villages were chosen randomly after implementers accounted for key eligibility factors including whether the village planned on subdividing, accessibility during the rainy season, and the presence of villagers capable of running the MAST application.

¹⁶ This allowed any remaining villages that were subdividing to complete the process, ensuring an accurate list of eligible villages for assignment into the treatment or the control group. It also ensured that LTA would not end up implementing activities in a village that would later subdivide, as this would substantially complicate LTA’s implementation activities (LTA relied on specific satellite imagery and had limited resources to work through VLUPs, sensitization, and other activities. In the event of a potential village division after LTA had completed any of those process in a given village, it would have been difficult for implementers to repeat the process in the newly created villages following a subdivision).

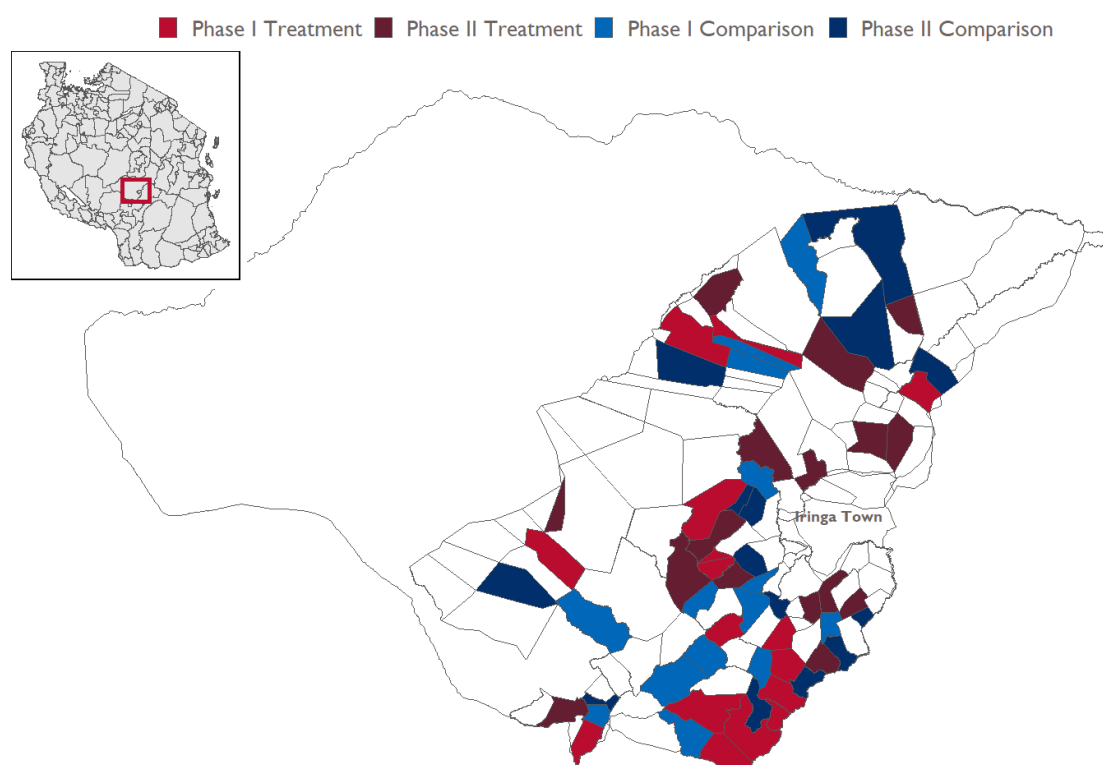
¹⁷ The IE design initially planned for the first set of 15 randomly chosen villages to begin implementation in 2017 and the second set of 15 randomly chosen villages to begin implementation in mid-2018. The timing of Phase II was later moved up by around 8 to 10 months to accommodate LTA’s implementation schedule, which rolled out faster than initially planned.

¹⁸ See the LTA IE baseline and midline reports for additional description of the randomization process.

¹⁹ The DLO’s list of eligible villages was based on the local authorities’ own priorities and knowledge of the local context and excluded approximately 45 villages that were either inaccessible, peri-urban, or otherwise deemed ineligible.

²⁰ Ultimately, two of the four reserve villages were used by LTA for implementation, with the other two reserve villages remaining in the IE sample as comparison villages.

FIGURE 3: MAP OF VILLAGES BY ASSIGNMENT AND PHASE



OUTCOME MEASURES

The evaluation team used statistical models to estimate LTA's causal impacts, drawing on a set of outcomes measures for each EQ that served as dependent variables in the causal estimation modelling. Table 4 lists these outcome measures. In addition to estimating the average effects of LTA's CCRO provisioning on households, the results were also disaggregated for each thematic area according to key characteristics of households, as listed in the Heterogeneity Analysis column in Table 4. The heterogeneity analysis was conducted for descriptive purposes and to test for differences in impacts across key subgroups, to contribute to understanding how impacts may have varied across different types of households.

TABLE 4: OUTCOME MEASURES AND HETEROGENEITY ANALYSIS BY THEME

Thematic Area and EQ	Outcome Measures	Heterogeneity Analysis
1. Tenure security and land management	<ul style="list-style-type: none"> • Likelihood a household has a CCRO • Willingness to pay for a CCRO (Tanzania shillings) • Perceived risk of land expropriation within the community (binary) • Perceived expropriation risk for household's parcels (binary) • Risk of land loss if land is left fallow (binary) • Familiarity with land laws (binary) 	<ul style="list-style-type: none"> • Gender of household head • Building/urbanization context
2. Land disputes	<ul style="list-style-type: none"> • Incidence of land disputes (integer) • Dispute duration (continuous) • Perceived likelihood of a boundary dispute in next five years (binary) 	<ul style="list-style-type: none"> • Gender of household head • Building/urbanization context
2.1 Land disputes	<ul style="list-style-type: none"> • Dispute type <ul style="list-style-type: none"> ◦ Inheritance (binary) ◦ Rental (binary) ◦ Neighbor (binary) ◦ Family-related (binary) 	<ul style="list-style-type: none"> • Gender of household head • Building/urbanization context
3. Investment and land use	<ul style="list-style-type: none"> • Land improvement index (index of parcel investments) <ul style="list-style-type: none"> ◦ Soil conservation (binary) ◦ Erected buildings (binary) ◦ Fencing (binary) ◦ Wells or pump irrigation (binary) ◦ Terracing (binary) • Incidence of tree planting on farms (fruit and non-fruit trees) (binary) • Likelihood of following any parcels (binary) • Use of fertilizer (binary) • Number of different crops grown by HH (integer) • Total landholding by households (ha) • Use of communal land (binary) 	<ul style="list-style-type: none"> • Gender of household head • Building/urbanization context
4. Empowerment	<ul style="list-style-type: none"> • Women's possession of a CCRO for any parcel (binary) • Women's perceived tenure security (binary) • Wives' involvement in decision making around the use of household land parcels • Wives' participation in household decision making • Wives' control over use of income related to production • Wives' comfort speaking at village meetings or in group settings (binary) 	
5. Economic and environmental outcomes²¹	<ul style="list-style-type: none"> • Farm earnings over past 12 months (Tanzania shillings) • Credit access by household (binary) • Amount borrowed (continuous) • Crop diversification to higher value crops (integer) • Household food security (integer) 	<ul style="list-style-type: none"> • Gender of household head • Building/urbanization context

²¹ The economic and environmental outcomes covered in EQ5 are expected to unfold over a longer period, hence LTA's full impact on these outcomes may not be observable over the IE's timeframe. Thus, the endline analysis provides a preliminary indication of these impacts, while a more comprehensive assessment would require an additional data collection round.

HOUSEHOLD SAMPLE AND QUANTITATIVE DATA COLLECTION

The sample size for this IE was determined in part by design constraints based on LTA's implementation plan and the resources available for the evaluation, which limited the total number of clusters to 60 (30 LTA villages and 30 control villages). The initial IE design aimed for 25 households to be surveyed in each of the 60 villages, for a total sample of 1,500 households (see power calculations in Annex F). The number of households for the IE was determined through a power analysis conducted at the IE design stage, which estimated at least 19 households would be required per cluster to detect a treatment effect of 0.1 standard deviations from the mean.²² Because the number of treatment clusters for LTA was fixed at 30, a critical aspect to determining whether the IE would be able to statistically detect an effect of a given magnitude is the similarity of responses among households within each village, known as the intra-cluster correlation. The IE team's power analysis estimated that, given the number of villages in the sample and other parameters, the IE would be sufficiently powered to detect treatment effect sizes of around 0.2 standard deviations from the mean for most of the outcomes assessed. However, the IE is underpowered to differentiate treatment effects from statistical noise for some outcomes with higher intra-cluster correlations, such as some indicators for the land investment and empowerment outcomes (see Annex F for additional details on power calculations).

Within each household, the IE was designed to collect quantitative information from the household head via a survey, irrespective of head gender. In addition, a shorter survey was administered to the head's primary spouse, where applicable and available. In practice, the actual number of households surveyed per village varied slightly across villages, although the baseline average across both the treatment and control groups remained 25 households per village. Baseline equivalence was reported in the Phase I and Phase II baseline reports, and is summarized in Annex F. Key outcome measures were balanced across treatment and control villages on average for both baseline phases.

Baseline data collection took place during March-April 2017 for Phase I villages and in September-October 2017 for Phase II villages. Respondents were randomly selected via a random walk process²³ at baseline, and then resurveyed at endline. Household survey data collection at endline took place during February-March 2020, during a period of heavy rains. Annex H provides further details on the endline data collection.

Figure 4 shows the final household sample size at endline, which consisted of 2,243 respondents across 1,361 households (1,079 respondents from 651 LTA households and 1,164 respondents from 710 control group households).²⁴ At endline, 209 households were not able to be interviewed from the initial baseline sample of 1,570 households, corresponding to an attrition rate of 13.3 percent. The most common reason for attrition between survey rounds was households moving away from the village, which accounted for around 37 percent (n=78) of the attritors. There were 15 cases where households refused to be interviewed.

The IE team analyzed household attrition between baseline and endline both descriptively (Figure 4) and inferentially to test for attrition bias and gain insights on whether there was a correlation between treatment status and attrition that could introduce bias into the endline analysis. The team collapsed the household-level data to track when households may have dropped out of the survey across each round. A key question for any attrition analysis is whether simply being assigned to receive LTA or not is correlated with attrition. In cases where the treatment itself affects attrition, additional statistical work is required, but this may also suggest that a reassessment of the theory of change or a review of implementation processes is needed.

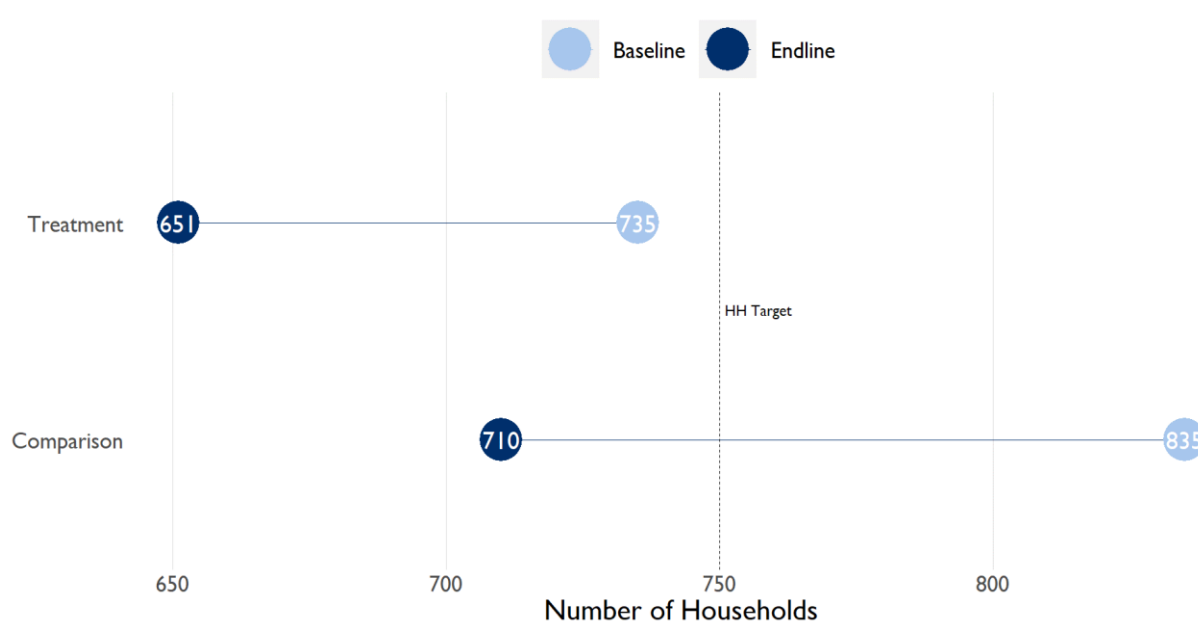
²² Assuming a significance level of 0.05, 30 clusters in each assignment group, 80 percent power, an intra-cluster correlation of 0.1, and a binary outcome.

²³ As noted in the Phase I Baseline Report, enumerators started from the village center and then surveyed every tenth house.

²⁴ Enumerators sought to interview the head of household and primary spouse, but in some cases only one respondent in a household was available.

The IE team conducted two-sided t-tests to compare average household attrition rates across assignment groups. These tests present methodological issues, but are a helpful starting point for determining if average attrition levels are similar across LTA and non-LTA households, which is indeed the case ($p=0.85$). The variance in attrition and in assignment status also is not statistically significant. The team then ran a regression to estimate the probability of a household dropping out of the sample as a function of treatment status, gender, and age of the household head at baseline, while controlling for village fixed effects. Assignment to LTA did not have a statistically significant or meaningful relationship with the likelihood of household attrition, controlling for basic household characteristics and village fixed effects ($p=0.95$). There was a significant relationship between the household head gender and attrition: male household heads were about half as likely to drop out of the sample as female-headed households (odd ratio [OR] = 0.57). This is not surprising given that there were few female-headed households in the sample across each round.

FIGURE 4: SAMPLE SIZE BY ASSIGNMENT GROUP AND BASELINE-ENDLINE ROUND



SURVEY INSTRUMENT

As with previous data collection rounds, the endline survey consisted of two main household surveys:

1. The **Head of Household Survey** was given to the individual who was identified as the head of household during previous data collection rounds or self-identified as the head of household if the respondent was a new partner to a previously interviewed spouse. This survey lasted around an hour.
2. The **Wives Survey** was given to the primary spouse/partner of the head of household. This survey lasted 25 minutes on average.

The survey team collected data via mobile devices. Both surveys included questions on disputes, self-efficacy, loans, decision making, and familiarity with land laws. All surveys were geo-coded for additional quality assurance and to facilitate follow-up data collection rounds. Annex B provides the baseline survey questionnaire and Annex C provides the midline questionnaire. The endline survey was largely comprised of questions from the previous survey instruments. Most questions were based on validated questions from the Tanzanian National Panel Survey questionnaires. New questions were added to confirm if respondents had been interviewed in previous data collection rounds and whether they heard about LTA on the radio.

QUALITATIVE DATA COLLECTION

Qualitative data collection at endline was planned to take place six weeks after the conclusion of household survey data collection, to enable the IE team to draw on preliminary quantitative results to inform the design of targeted follow-up questions for the qualitative data collection. The qualitative data collection at endline was designed to include focus group discussions and key information interviews (KIs) with men and women in a subset of LTA and control group villages, along with KIs with local authorities at village and district levels. However, due to the rapid onset of global travel restrictions due to the COVID-19 pandemic in March 2020 just as the household survey data collection was concluding, qualitative data collection at endline could not be conducted as planned. The team was able to conduct remote KIs with LTA staff and district- or ward-level key informants. However, qualitative data collection with LTA beneficiaries and residents of control group villages could not proceed as planned. Ultimately, the team conducted remote interviews with 14 individuals at endline, including 4 LTA staff (conducted as a group interview), 3 district- or ward-level community development officers (CDOs), 3 DLO staff, and 3 Ministry of Lands (MOL) land officers or senior land officers. KIs were conducted in Swahili and transcribed and translated to English by an IE team member, except for the KIs with the LTA team, which were conducted in English. Annex G lists the endline KIs.

ANALYTIC APPROACH

The IE used a household panel dataset to assess the impacts of LTA's combined sensitization, mapping, verification, land registration, and other village-level activities related to CCRO provisioning on select household outcomes for four of the five thematic areas²⁵ on which the EQs focus. LTA conducted systematic land formalization activities in the randomly assigned LTA villages, aiming for all households in LTA villages to receive the activity's sensitization, mapping, verification, and other steps associated with formalized land registration. The analyses therefore provide intent to treat (ITT) impact estimates of LTA's systematic support to customary land formalization in villages, comparing average household impacts from villages that received LTA's bundled activities to those that did not.²⁶

Treatment effects are estimated using the below model specification. The treatment effect is estimated by a regression coefficient on a dummy variable that interacts time and treatment. Continuous covariates are standardized by centering and dividing by two standard deviations to make comparisons across parameters easier.²⁷ For continuous outcome variables at the household level, the panel regression models take the following form:²⁸

$$Y_{it} = \gamma_0 + \gamma_1 X_{it} + \gamma_2 \delta_t + \beta(\delta_t * T_i) + \gamma_i + \varepsilon_{it} \quad (1)$$

Where Y_{it} is the outcome of interest for household i at time t , X_{it} is a vector of covariates, δ_t is a dummy variable equal to 1 at the endline, T is a dummy variable equal to 1 for members of the

²⁵ These are tenure security and land management; land disputes; investment and land use; and economic and environmental outcomes. The IE was designed to assess empowerment outcomes qualitatively rather than through inferential impact analysis.

²⁶ The ITT is typically the policy-relevant effect and USAID's primary interest for a systematic village-wide land formalization program that aims to treat all households in randomly selected villages. An alternative approach is to estimate the treatment effect-on-the-treated, which would estimate LTA's impact by comparing only those respondents who received LTA's full suite of activities, including the CCRO, to a comparison group that did not receive any LTA activities. However, such a comparison would be less valid and generally provides less meaningful policy insights on average effects of land formalization programs in which all households are offered treatment, since households that ultimately are not able to obtain the final step in a systematic village-wide land formalization program (the CCRO, in this case) are not determined at random.

²⁷ For more on standardizing and rescaling see, Gelman, Andrew. (2008). "Scaling regression inputs by dividing by two standard deviations". *Statistics in Medicine* 27: 2865–2873.

²⁸ Logit models are used for binary outcomes.

treatment group, γ_i is a vector of village-level fixed effects, ε_{it} is a random error term, and γ and β are parameters to be estimated.

The IE team used robust standard errors and confidence intervals clustered at the village level. The estimate of LTA's impact is given by β , which reflects the average treatment effect. Under standard assumptions, β provides an unbiased estimate of LTA's causal impact on the outcome Y .

The model includes a set of pre-treatment covariates to control for potential differences in the treatment and control groups, and village-level fixed effects that control for time-invariant unobserved factors. The following covariates are included in the model:

- **Building settlement:** a continuous variable sourced from Nieves, et al. (2020) that uses remotely sensed data to provide a measure of urbanization within a 100-meter radius of each household.²⁹
- **Asset index:** an index ranging from 0 to 1 based on households' self-reported assets.
- **Distance to Iringa:** a continuous variable sourced from the Google Maps API that provides the distance from each household to Iringa Town marketplace.
- **Household hunger score:** a 0-6 index that provides a measure of household food security.³⁰
- **Number of household members:** a continuous variable based on the self-reported number of household members.
- **Gender:** a binary measure equal to 1 if the respondent is male.
- **Education:** a five-level factor variable, ranging from no education to university, based on self-reported education at baseline.

Alternative Specification

The IE team also ran an analysis of covariance (ANCOVA) model for select continuous outcomes as an additional robustness check, following the specification below. This alternative specification is appropriate when autocorrelation between baseline and endline values of the outcome measure is low (i.e. below 0.2)³¹, as was the case for three economic outcomes assessed: food security, amount borrowed, and income.

$$Y_{ij} = \beta_0 + \beta_1 T_{ij} + \beta_2 X_{ij} + Y_{ij}^o + \gamma_i + \varepsilon_{it} \quad (2)$$

Where Y_{ij} is the outcome measured for household i in village j measured at endline, T_{ij} is a dummy that indicates treatment status, X_{ij} is a vector of co-variables as listed above, Y_{ij}^o is the value of the outcome as measured at baseline, γ_i is household fixed effects, and ε_{it} is the error term. Robust standard errors and confidence intervals clustered at the village level are also used. Under the ANCOVA specification, the main control variable is the baseline value of the outcome variable.

KEY DESIGN LIMITATIONS

- **Timing of Phase I and Phase II baseline data collection.** The original IE design proposed panel annual data collection across three rounds at the same point in time for each year. A key goal of this approach was to capture responses from approximately the

²⁹ Nieves, Jeremiah J., Alessandro Sorichetta, Catherine Linard, Maksym Bondarenko, Jessica E. Steele, Forrest R. Stevens, Andrea E. Gaughan et al. "Annually modelling built-settlements between remotely-sensed observations using relative changes in subnational populations and lights at night." *Computers, environment and urban systems* 80 (2020): 101444.

³⁰ See Ballard, T., J. Coates, A. Swindale, and M. Deitchler. "Household Hunger Scale (HHS): indicator definition and measurement guide." Food and Nutrition Technical Assistance II Project, FHI 360 (2011).

³¹ For more on the value of this approach see McKenzie, D. (2012). Beyond baseline and follow-up: The case for more T in experiments. *Journal of Development Economics*, 99(2), 210-221.

same seasonal context. However, the IE timeline and design were later amended to accommodate LTA's implementation schedule, which resulted in substantial changes. As noted in the Phase II Baseline-Phase I Midline report, baseline data collection for the Phase II villages took place six months after the Phase I baseline, rather than one year after the initial baseline (and one year into implementation for the Phase I villages), as initially planned. This substantially shortened the gap between these two phases in the IE sample, from 12 to 6 months. It also resulted in a baseline sample that consisted of households that were interviewed across different seasons during which agricultural, market, and cultural activities differ in Iringa District. As noted in the Phase II Baseline report, the sample also shifted slightly, with more wives/female primary spouses included in the Phase II baseline and fewer female-headed households. The IE's ability to control for measurement differences in self-reported outcomes that may vary seasonally, and even the perception of the survey at a different time of the year, are difficult to fully account for in the analysis, and are also constrained by the IE's overall small sample size. It is possible that these changes introduced additional variability into the baseline data that could have made it more difficult for the IE to detect a true but small effect for some outcomes, particularly those that are more likely to vary by season or by varying recall times, such as some farm investments, farm earnings, or food security measures.

- **Sample size limitations due to implementation constraints.** This IE was designed to examine impacts across 30 treatment villages where LTA was implemented. The IE team estimated that this was a sufficient sample size to detect impacts on the outcomes of interest, particularly tenure security, based on power calculations conducted at baseline (Annex F). However, a larger number of village clusters is generally preferable for cluster-randomized IE designs. The small number of villages for this IE presents some risks for the ability to make causal linkages of LTA to certain outcomes and impacts further down the causal chain. For example, sustainable land clearing practices will ideally lead to lower greenhouse gas emissions, but it is doubtful that the effects of such activities can be measured within the timeframe and from the limited number of villages this IE examined. The relatively small sample size also means that key subgroup and other heterogeneity analyses of interest, such as differences in impacts across male- and female-headed households, are under-powered for this evaluation. While it is important to understand how impacts for women, for example, may differ compared to men across assignment groups, the IE design was capped by the scale of LTA implementation and by budgetary considerations that could not, for example, allow for simply oversampling control villages. The IE team aimed to mitigate this limitation by being clear where results may not be sufficiently powered to detect policy-relevant effect sizes (or were only powered to detect large effect sizes that were unlikely to occur within the IE timeframe or given the theory of change).
- **Recall bias.** The IE draws on several key indicators and covariates that are self-reported measures about activities that may have taken place months or even years ago (e.g., CCRO receipt). Respondents are more likely to recall events that occurred closer to the time of survey implementation than those that may have taken place several months before their interview. For some measures, such as income or disputes, the IE does not have a way to triangulate responses to check the magnitude of bias that could result from unintentionally erroneous responses. Such responses are observable in the data, for example with a small number households reporting incredibly large parcel holdings or crop sales amounts, as well as potentially under-reporting the duration of disputes or number of crops grown. Qualitative data, as well as recent literature on agricultural productivity and land tenure, can help contextualize and supplement variables from the household survey that are highly sensitive to respondents' ability to accurately recall their experiences with LTA.
- **Inability to collect full qualitative data at endline due to COVID-19.** The perspectives of individual villagers and village-level governance institutions are less

represented in the endline analysis and interpretation than the IE team planned and typically would like to have at endline for an IE because the COVID-19 pandemic prevented the team from conducting planned qualitative data collection in villages after the household survey took place. The team was able to conduct KIs with DLO and ward-level CDO staff, together with LTA staff. However, the team was not able to collect qualitative data directly from individual LTA beneficiaries or from members of control group villages. This may limit the interpretation of results for some outcomes, particularly related to empowerment – where qualitative data play an important role in understanding men and women’s perspectives on a range of complex issues that are not as well captured in the quantitative household survey data.

FINDINGS BY EVALUATION QUESTION

EQ1: IN WHAT WAYS AND TO WHAT EXTENT DO LANDHOLDERS WHO HAVE RECEIVED FORMAL LAND DOCUMENTATION THROUGH THE ASSISTANCE OF LTA PERCEIVE THEIR LAND RIGHTS TO BE MORE SECURE?

Key Findings for EQ1

- **Possession of a CCRO:** LTA’s systematic village-wide support for CCRO issuance increased the likelihood that a household would have a CCRO by about 100 percent (OR 1.60, $p < 0.001$) relative to the control group, an unsurprising result given LTA’s achievement of widespread CCRO provisioning in LTA villages.
- **Willingness to pay for a CCRO:** LTA did not have a statistically significant impact on willingness to pay for CCROs (OR 1.06, $p = 0.2$).
- **Perceived tenure security within the community:** Both LTA and control group villages experienced an increase in perceived tenure security within the community. LTA appears to have positively influenced concerns about land expropriation within communities, resulting in an 18 percent decrease on average in a household’s probability of expressing concern over land expropriation in their community (OR 0.22, $p = 0.00$).
- **Perceived household-level tenure security:** Respondents in both assignment groups experienced an increase in perceived tenure security over their individual parcels but the increase was higher among LTA households, particularly for female household heads. Controlling for contextual factors, LTA activities led to a 16 percent decrease on average in a household’s probability of feeling tenure insecure (OR 0.19, $p = 0.00$).
- **Perceived risk of losing land under fallow:** LTA did not appear to influence respondents’ perceptions about the risk of losing land that is left fallow. There was no difference in security around fallowing by gender. KIs at endline suggested that fallowing concerns could relate to households’ perceived vulnerabilities about losing land that appears to be in an unused state, irrespective of the protections that a CCRO confers according to the law.
- **Familiarity with land laws:** LTA had no statistically significant effect on self-reported familiarity with land laws. Familiarity with land laws increased across both treatment and control villages, controlling for other factors.

EQ1 examines multiple aspects of tenure security that, taken together, provide an overall sense of respondents’ confidence at endline in their land rights and ability to continue using their land as they wish in the future. To examine how LTA affected household perceptions of their security of land rights, the IE team focused on measures of household possession and valuation of formalized customary land documentation, together with six constructs for tenure security:

- **Possession of customary land documentation:** the likelihood that a household has formalized documentation recognizing their customary land rights.

- **Willingness to pay for a CCRO:** the amount in Tanzanian shillings that respondents reported they would be willing to pay to have one of their parcels mapped and to obtain a CCRO (or the amount a household would pay to obtain a CCRO for a newly acquired parcel, for households that had already received a CCRO), as a measure of respondents' inherent valuation of the document.
- **Community-wide tenure security:** respondents' perception of the likelihood of land loss within their community.
- **Household-level tenure security:** respondents' perceived risk of land expropriation for their individual parcels within the next five years.
- **Perceived risk of losing land under fallow:** respondents' self-reported perceived risk of losing against their land that has been left to fallow.³²
- **Familiarity with land laws:** provides a measure of whether LTA's training and outreach influenced beneficiaries' overall understanding of their formal land rights.

These measures directly address key outcomes from LTA trainings in treatment villages (on land rights, land laws, and the CCRO process), mapping, and customary land documentation activities. In keeping with LTA's theory of change, the IE sought to measure whether and the magnitude by which intended outcomes related to tenure security changed, as well as whether this change was different than what would have been experienced in villages had they not received LTA's support.

SUMMARY OF DESCRIPTIVE FINDINGS

CUSTOMARY LAND DOCUMENTATION AND WILLINGNESS TO PAY FOR A CCRO

LTA achieved widespread provisioning of CCROs in the villages in which it operated, while the percentage of households that obtained the document remained low in control group villages without a systematic CCRO facilitation program such as LTA. Eighty-six percent of LTA respondents (n=928) reported having a CCRO by endline, compared to 12 percent of control group respondents (n=140) (Figure 5).

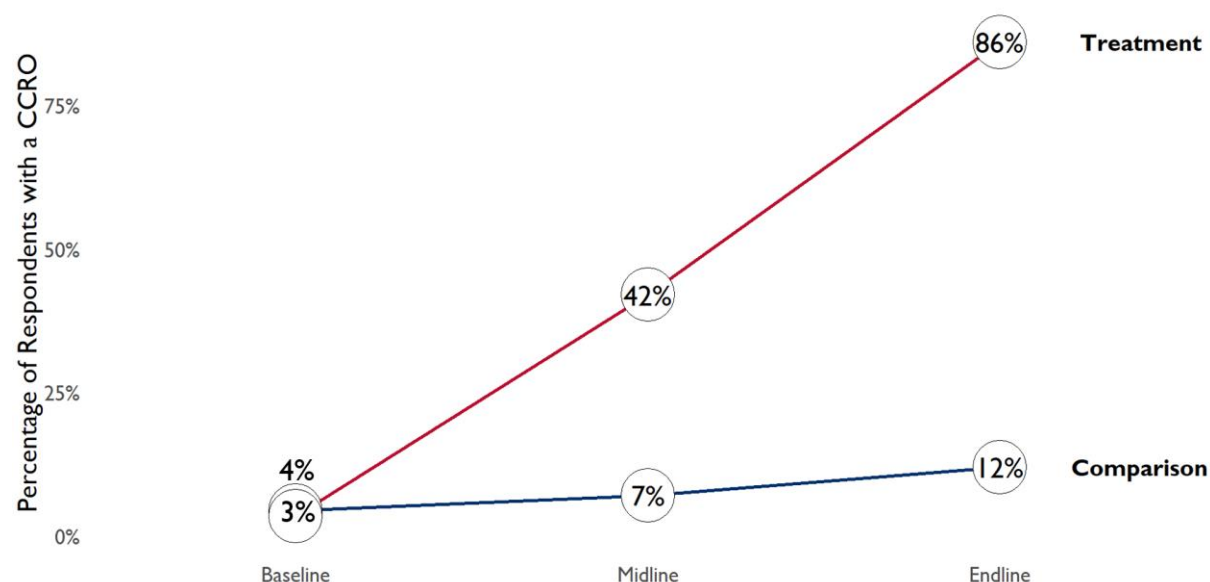
In the absence of a program to facilitate obtaining a CCRO, it is difficult and costly for Tanzanian households to navigate the process and obtain a CCRO on their own. Households that do obtain CCROs on their own are often wealthier or better connected than their typical village peers.³³ In the IE sample, control group respondents with CCROs were, on average, older (50.1 years old compared to 46.8 years old for those without CCROs), more likely to have reported borrowing from banks in the past year (15 percent of respondents with CCROs compared to 12 percent for those without a CCRO), and more likely to have fallowed one or more of their parcels (15 percent, compared to 10 percent of control group respondents without a CCRO). With respect to households' landholdings, a typical correlate of household wealth status in rural villages, control

³² Fallowing refers to leaving land uncultivated for a period of time, typically to restore soil nutrients and maintain productivity. As land under fallow reverts to a weedy or bushy state of natural vegetation regrowth, it may appear unused or under-utilized to outside observers. Fallow land may be more vulnerable to reallocation or competing claims in some contexts, such as where land ownership or use rights are more difficult to defend or where laws or cultural norms historically required land to be actively used or developed to maintain use rights. In Tanzania, customary land holders may view land left fallow for long periods as particularly vulnerable to expropriation. Historically, village land that was not actively farmed, hence considered 'unused', was often seen by the state as available for alternative uses. This included reallocation by the village or the state to external investors or those who, according to the prevailing 'use it or lose it' views of the time, were seen as being able to farm the land more effectively to contribute to the country's agricultural and economic growth. Under Tanzania's current land laws, land is classified into three categories: village land, general land, and reserve land. CCROs are only applicable for holders of village land under customary use rights. However, the 1999 Land Act also introduced ways for the state to claim or reclaim areas of village land into the general land category, by defining general land as "all public land that is not village land or reserved land and includes unoccupied or unused village land" (URT 1999, pp 24-25, IE team's emphasis). In doing so, the law may also contribute to maintaining historical disincentives for rural villagers to leave land fallow.

³³ Stein, H., Maganga, F., Odgaard, R., Askew, K., & Cunningham, S. (2016). The Formal Divide: Customary Rights and the Allocation of Credit to Agriculture in Tanzania. *The Journal of Development Studies* 52(9):1306-1319.

group households controlled a similar number of parcels as those in the LTA group irrespective of whether they had a CCRO. Among households that reported having a CCRO, the average number of parcels was 3 (3.3 parcels in the comparison group, 3.1 in the treatment group) in both assignment groups. At endline, the average total parcel holding was 5.8 hectares for LTA households and 3.7 hectares for control group households overall, but 5.1 hectares on average for control group households with CCROs.

FIGURE 5: PERCENT OF RESPONDENTS WITH CCROS BY ASSIGNMENT GROUP AND SURVEY ROUND



LTA reported that 87 percent of beneficiaries collected their CCROs, which aligns closely with the 86 percent of the treatment group that reported having a CCRO as obtained via the IE sample. For both LTA and control group villages, the next most common document type cited was “Other Government Document”, reported by 7 percent of control group respondents (n=51) and less than 1 percent of LTA treatment respondents (n=3).³⁴ Respondents reported obtaining a variety of documentation types over different periods, with CCROs generally reported to have been obtained in the three years prior to the survey (2017-2019, i.e., during the LTA implementation period) (Figure 6).

LTA required that all land claims be recorded and the activity tracked the status and eventual outcome for each claim. According to LTA staff and activity tracker information, the main reasons why some individuals or households in LTA villages did not receive a CCRO included situations in which the household provided incomplete information, the parcel boundary overlapped with land from another village,³⁵ or it was not possible to resolve a land dispute.³⁶ In addition, a small number of parcels (just under 1,500, or less than 2 percent, in LTA villages) failed to obtain CCROs because they were located within government road reserves, forest reserves, marshlands, wildlife management areas (WMAs),³⁷ or in designated grazing areas. LTA’s activity tracker data indicate that

³⁴ Respondents described these “Other” documents largely as a type of letter or agreement related to a land purchase.

³⁵ Per LTA, if the parcel had more than 50 percent overlap with another village boundary, LTA did not issue the CCRO until a discussion was held with members of the adjacent village. In some cases where entire hamlets fell outside the village boundary, LTA did not issue CCROs for land in those hamlets.

³⁶ At the time of the IE endline, LTA noted that some parcels in LTA Phase I or Phase II villages still had outstanding disputes or missing information, which LTA was working to resolve.

³⁷ WMAs are contiguous areas of village land that have been set aside by several neighboring villages for wildlife conservation purposes. They aim to provide connectivity and facilitate movement of wildlife between Tanzania’s many protected areas, and in theory also allow villages to benefit from revenue from wildlife tourism in the area. Several

such claim denials were more common in certain villages³⁸ and KIIs with DLO staff also indicated that denials of land claims by the DLO were common in some LTA villages.

Claim denials typically occurred for land determined ineligible for registration because the parcel was located in an area that had been set aside by villages during the VLUP process (such as a designated grazing area)³⁹ or was otherwise reserved by the government (e.g., forest reserves, road reserved areas, water catchment areas, marshlands). Claim requests involving government reserved land were often brought to the DLO for a decision. If the claim was rejected, KIIs with DLO staff indicated that the DLO typically did not make subsequent follow ups with the claim seeker beyond issuing a rejection notice, and such individuals typically were not eligible for compensation related to losing their perceived customary right to the land. KIIs with DLO staff emphasized that sensitization was conducted in each village at the start of LTA regarding the types of land that were ineligible for customary land claims, and claim denials were made in accordance with prevailing laws.

LTA was aware of examples in which households did not receive CCROs, for example because their parcels were fully in a protected area, or only a portion of the household's parcel was demarcated and issued a CCRO because the other portion was located in a reserved area or in another village. However, LTA staff were not involved in decisions regarding claim denials and their enforcement and whether any compensation was provided, as these responsibilities fell solely under the DLO's purview. Perhaps as a result, LTA staff could not speak at endline to the ensuing effects of claim denials on such claimants or confirm the extent to which LTA households may have been wholly disenfranchised of their customary land use as a result of such denials.⁴⁰

DLO staff also indicated that a small number of LTA households may not have received a CCRO for any land that they customarily used, either because the land was located in another village that LTA was not working in⁴¹ or in areas that were ineligible. In the absence of village-level KIIs with such households, the IE team unfortunately cannot provide additional perspectives of such households.

As a measure of respondents' valuation of the CCRO, respondents were asked how much they would be willing to pay for a CCRO in each survey round. As in previous rounds, the IE team disaggregated the willingness to pay (WTP) results by whether respondents already had a CCRO, since this could influence how people assess the document cost and their intrinsic valuation of the document.

activities are banned or limited in WMAs, including charcoal production, agriculture, settlements and sometimes livestock grazing, collection of fuelwood, and similar activities. These restrictions in WMAs are reflected in the VLUP established for the village. Per KIIs with LTA staff, LTA attempted to issue a communal CCRO for land in a WMA and advocated for reducing the area designated as a WMA in some villages where the WMA constituted a large proportion of the total village area. Tanzania's Wildlife Division has authority over WMAs and decisions on communal CCRO issuance or reducing WMA boundaries could not move forward because the relevant WMA board has been suspended by government.

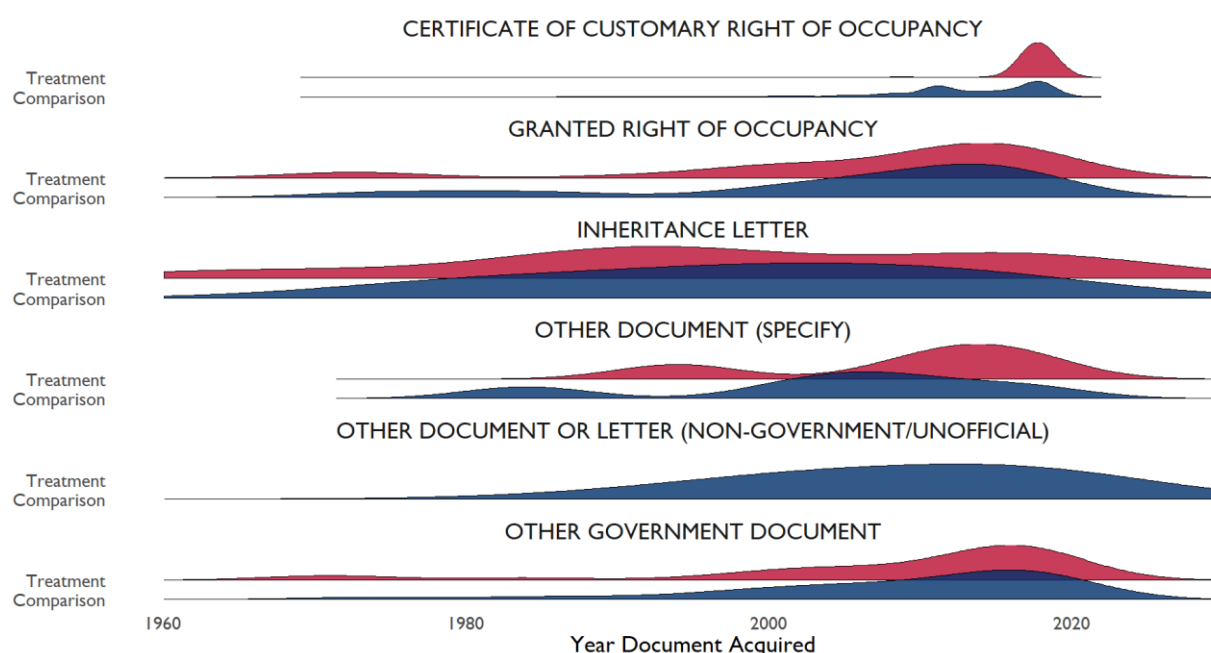
³⁸ LTA Monthly Report, February 2020.

³⁹ Land claims made in designated grazing areas were typically denied unless the claim seeker could demonstrate having used the land for 12 years before the approved land use plan was put in place.

⁴⁰ LTA staff were aware of some households that could not receive a CCRO for any of their land because the land was located in a village that LTA was not working in during Phase I. Those households will receive a CCRO for such lands during LTA's second phase of operation, provided the land is in a village that is eligible for LTA's support.

⁴¹ The IE survey sample appears to contain some households in this situation. Such households are likely to obtain CCROs for land in a non-LTA village during LTA's second implementation phase in Iringa District, which extends to all eligible villages in the district that were not covered during LTA's initial implementation in 2017-2019.

FIGURE 6: DISTRIBUTION OF DOCUMENT ACQUISITION YEAR BY DOCUMENT TYPE AND TREATMENT ASSIGNMENT



At endline, respondents reported their WTP for CCROs at around 26,000 Tanzanian shillings (TZS) in the control group and 34,000 TZS in the LTA group on average.⁴² As expected, there was some variation in WTP depending on whether respondents reported having CCROs. The average WTP for LTA respondents who reported having a CCRO was 30,399 TZS, but was more than double, at 63,788 TZS on average, for the 151 LTA respondents who did not report having a CCRO at endline and responded to this question.⁴³ The higher WTP suggests even stronger valuation of the CCRO by LTA respondents who, in contrast to most of their peers, did not obtain formalized land documentation through LTA. KII with LTA and DLO staff provided insights into why some LTA households or individuals may not have received a CCRO, and the DLO's standard process in cases where land claims were denied.⁴⁴ Those qualitative results, in conjunction with the higher WTP reported by LTA respondents who did not receive a CCRO, raise the possibility that the small group of LTA households that did not receive CCROs out of LTA's systematic village-wide land formalization process may feel heightened vulnerability or greater tenure insecurity as a result. The difference the IE team observed among LTA respondents without CCROs on WTP for a CCRO and on some of the tenure security indicators may suggest greater vulnerability for such households with respect to continued use of land they have customarily held.

In contrast to the treatment group, control group households with and without CCROs reported similar WTP values for a CCRO (25,837 TZS and 26,939 TZS, respectively). The endline control

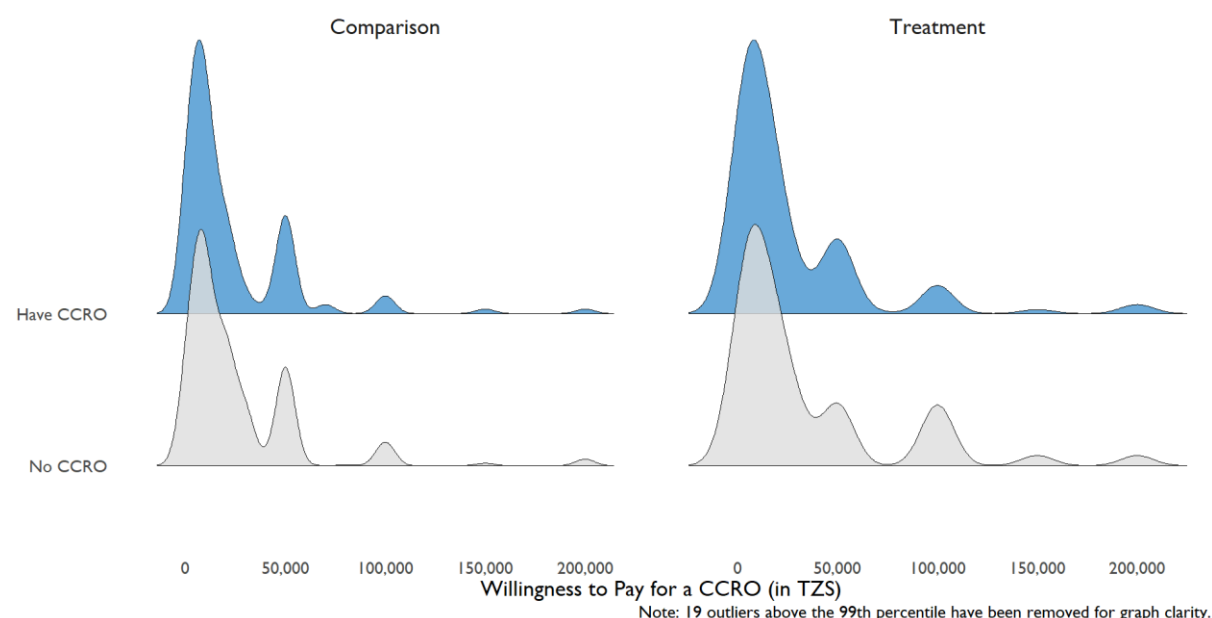
⁴² One TZS is approximately 0.00043 U.S. dollars, so 34,000 shillings is around \$14.69.

⁴³ These 151 respondents include 76 households in LTA villages where no respondents reported having a CCRO by endline (across the household head and the primary spouse). Households in which no one received a CCRO appear to be uncommon in that most of the LTA villages contained only a small number of such households in the IE survey sample. However, one village (Ihomasa) contributed 22 percent of the 151 respondents that reported having a CCRO, and 26 percent of households in which no respondent had a CCRO. According to LTA's FY18 annual report, LTA could not issue CCROs to residents from half of the hamlets in this village because their land fell outside of the village boundary and was located in a village that did not yet have a VLUP (p.40). Assuming the neighboring village is eligible for LTA's follow-on work that commenced in 2020, those households will be able to receive a CCRO for their parcels during LTA's next phase. However, this was unlikely to have been known at the time of LTA's work in the village during Phase I or by the IE endline data collection, and it is possible that such households may have felt permanently left out of the process and unable to benefit from CCRO provisioning.

⁴⁴ The IE team was not able to obtain household perspectives on this due to restrictions because of COVID-19.

group findings are consistent with previous rounds, which also found no meaningful difference in WTP associated with having a CCRO and a lower average WTP than the treatment group. The LTA group's higher WTP estimate provides additional support for LTA households' perceived benefit of a CCRO.⁴⁵ As shown in Figure 7, documentation status relative to WTP is right skewed with a similar distribution across assignment groups.⁴⁶ Around 90 percent of observations are at or under 50,000 TZS across both assignment groups.

FIGURE 7: WILLINGNESS TO PAY BY ASSIGNMENT GROUP AND CCRO STATUS



PERCEIVED RISK OF LAND LOSS WITHIN THE COMMUNITY

Concerns around expropriation risk in the community declined between baseline and endline across both assignment groups, but declined more sharply in LTA villages. At baseline, 12.4 percent of LTA households (n=91) and 13.0 percent of control group households (n=110) expressed that all or most people in their community were worried about land expropriation. At endline, this measure fell to 3 percent in the LTA group (n=20) and 11 percent (n=78) in control villages.

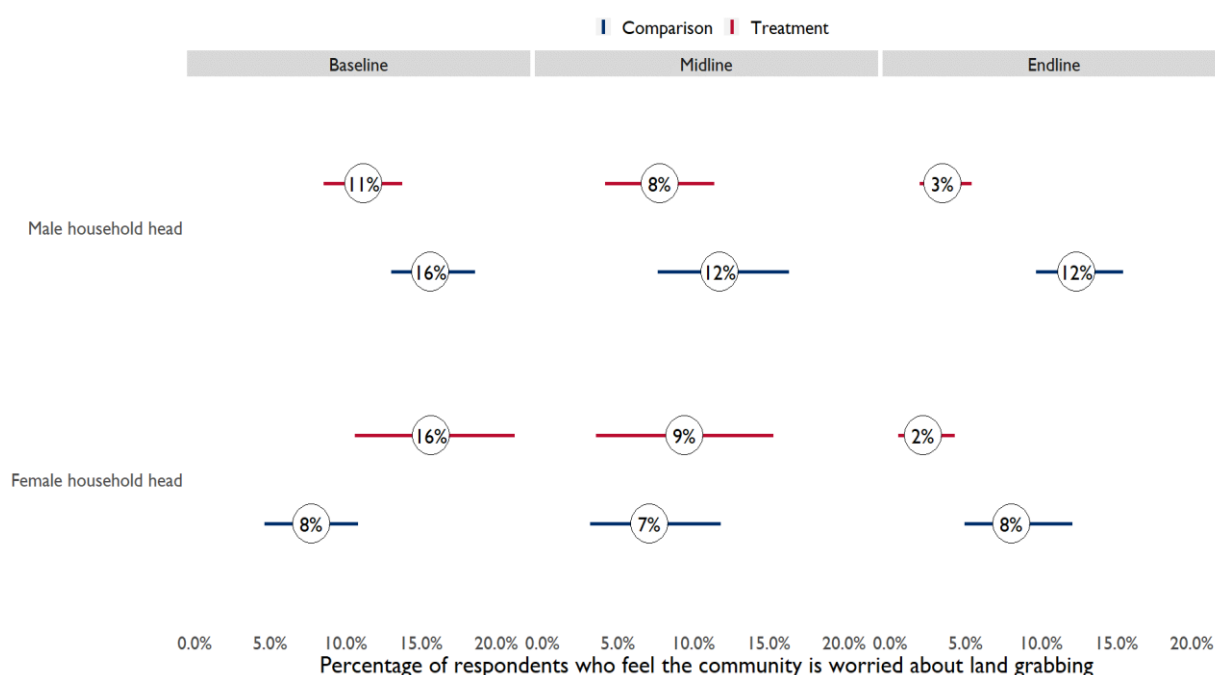
There was some variation by household head gender (Figure 8). Greater decline was observed among female-headed households⁴⁷ in LTA villages, as 16 percent of female-headed households at baseline (n=31) expressed community-wide concern about land expropriation compared to just 2 percent at endline (n=4). In contrast, the perception of community-wide concern about land expropriation did not change across survey rounds for female-headed households in the control group, expressed by around eight percent of such households in each round.

⁴⁵ In the next phase of LTA implementation, households are asked to pay TZS 30,000 to obtain the document. This amount was determined by LTA through costing exercises and affordability considerations for households.

⁴⁶ Previous rounds had a similar WTP distribution. The right tail of the distributed suggests there are a small proportion of outlier respondents in the sample who estimate their WTP at a level that is several times higher than the current actual cost of the document through LTA, but may reflect closer to what households have had to pay or anticipate paying when they seek to obtain the document individually (in the absence of a systematic land formalization program).

⁴⁷ Female-headed households were defined as households for which the primary respondent was female and was not considered simply a wife or female primary spouse when enumerators asked to speak with the head of the household.

FIGURE 8: COMMUNITY-WIDE LAND EXPROPRIATION RISK BY HOUSEHOLD HEAD GENDER



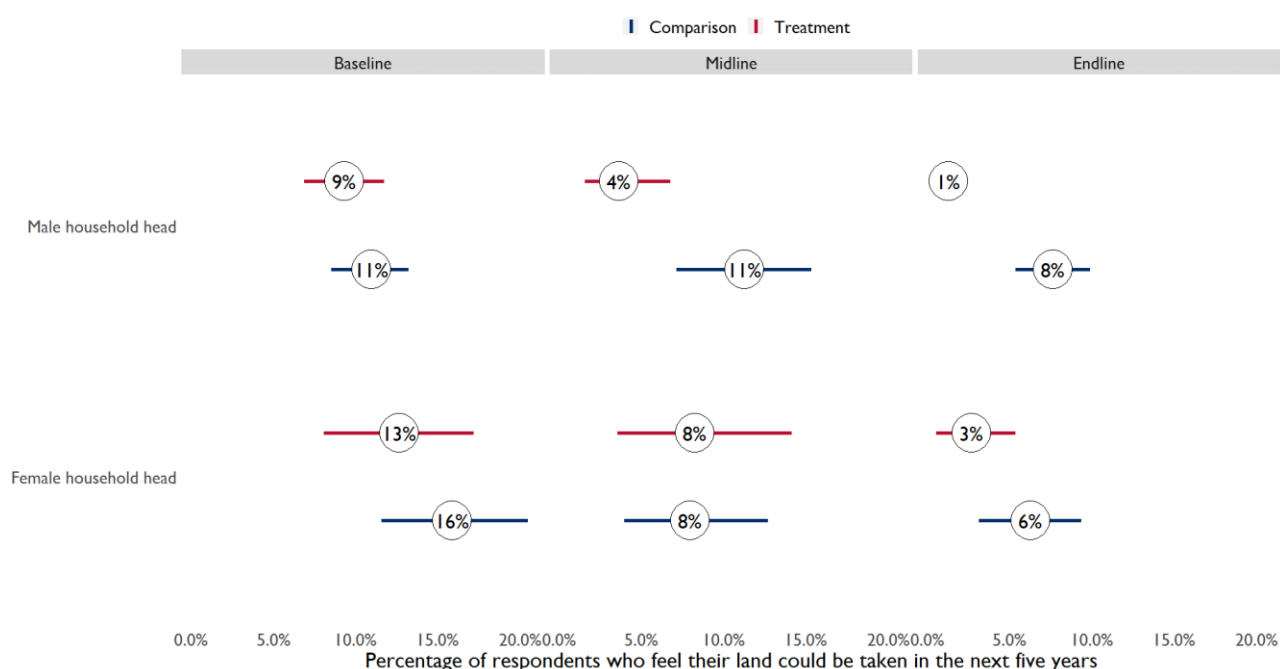
HOUSEHOLD-LEVEL PERCEIVED EXPROPRIATION RISK

The LTA group experienced a significant decline in the perceived risk of losing any of their own parcels in the next five years. Across each survey round, respondents were asked whether someone could try to take one of their parcels without their permission. At baseline, 10 percent of the LTA group (n=75) and 13 percent of the control group (n=104) felt someone could take their parcels against their will in the future. By endline, just 2 percent of LTA respondents (n=11) said the same, while 7 percent (n=51) of control group respondents were worried about their land being taken. This suggests an overall increase in tenure security among sampled households in both assignment groups, but a stronger improvement among LTA households.

This metric varies from the community-wide indicator reported above, as it asks for respondents' views on the risk of losing any of their own parcels controlled by the household, rather than their perceived risk of land loss within the community as a whole. Within LTA's theory of change for increased tenure security, respondents who have received formalized customary land documentation, training on land laws, and know their rights are anticipated to experience a reduction in concern about losing land against their will.

Similar to what the IE team observed for perceived expropriation risk within the community more broadly, disaggregating these results by gender of household head shows a declining trend in respondents' fear of land expropriation for their own parcels. However, this applies for both male and female household heads in both assignment groups and suggests that both male- and female-headed households experienced an increase in tenure security during LTA, irrespective of treatment group. In the LTA group, fear of parcels being taken without consent among male household heads dropped from 9 percent (n=50) at baseline to 1 percent (n=6) at endline, while female household heads in the treatment group saw a similar decline from 13 percent (n=25) at baseline to 3 percent (n=5) at endline. Female household heads in the control group saw a similar 10 percentage point decline in respondents' fear of parcels being taken against their will between baseline and endline. In contrast, male household heads in the control group saw a smaller 3 percentage point decline, from 11 percent at baseline to 8 percent at endline.

FIGURE 9: EXPROPRIATION RISK FOR OWN PARCELS BY HEAD GENDER AND ROUND



The positive change on these two tenure security indicators across LTA and control group households suggests that tenure security conditions generally improved across Iringa during LTA. The IE team's qualitative data collection at endline explored potential reasons for this, including the possibility that LTA's capacity building support to the Iringa DLO may have contributed to knock-on effects in control group villages. KIs at endline with ward-, district-, and ministry-level staff each pointed to LTA's strong capacity building support to the Iringa DLO, together with the visibility of LTA's work to neighboring villages that were not part of the activity^{48,49} and household exposure to sensitization on land laws via radio programming, as plausible contributing factors for some of the positive effects observed in non-LTA villages.

Other channels by which this could have occurred included through general skills and knowledge transfer to DLO staff, which they in turn applied to their normal work schedule and outreach activities in non-LTA villages in the district during LTA. Improved service delivery by the DLO in non-LTA villages in the control group could have improved respondents' confidence in the DLO's ability to uphold their customary land rights, or perhaps undertake CCRO issuance in their own village in the future.⁵⁰ For example, DLO staff noted that they applied LTA's system for the VLUP

⁴⁸ For example, LTA conducted inter-village mediation with some villages adjacent to LTA villages as part of the VLUP process, working with village councils from adjacent villages to obtain agreement on village boundaries and in some cases rectifying village boundaries. Another potential route was through the public mobilization events and issuance ceremonies that LTA held in LTA villages, which could have been attended or heard by members of other villages. Also, LTA conducted youth training at secondary schools, which may serve students from multiple villages (not just LTA villages) and the training was conducted for all students.

⁴⁹ As Figure 3 shows, nearly every control group village shared some portion of its boundary with an LTA village, and LTA did interact with village officials from several neighboring villages to harmonize boundaries or come to agreement on issues related to boundary overlaps. In addition, information about LTA's work could have easily reached villagers in neighboring villages through a number of channels, including friend/relative networks, LTA's public issuance ceremonies, and visibility through local media.

⁵⁰ Overall, however, DLO staff noted that their visits to non-LTA villages were not as frequent as their work in LTA villages during LTA, and a lack of DLO resources was commonly mentioned as a constraint on a stronger presence by the DLO in non-LTA villages. The DLO also issued CCROs in non-LTA villages during this time, although this was sporadic and only at the specific request of individuals or small groups of villagers (in comparison to the systematic village-wide process done in LTA villages). Such work could only be done in villages that already had a VLUP, as the District does not currently

process in non-LTA villages as well⁵¹ and provided training to land committees in non-LTA villages using the system that LTA developed. LTA was also commended for having helped modernize the DLO, not only in terms of skills but also physical infrastructure and updating the office's mapping equipment and technology. CDOs also reported having strong knowledge of land rights and land laws as a result of LTA trainings, which improved their ability to serve as educators and provide services to villagers regardless of whether they were working in LTA villages.

EXPROPRIATION RISK FOR LAND LEFT FALLOW

Descriptive data suggest that across both assignment groups a fear of losing land that is left fallow increased over time. As shown in Figure 10, at baseline an average of 43 percent of treatment respondents (n=319) and 48 percent of control group respondents (n=402) felt it was “somewhat risky” or there was a “very high risk” of losing their land if they fallowed their parcels. At endline, these figures increased to 55 percent (n=355) and 59 percent (n=416) in the treatment and control group villages, respectively.

This trend is contrary to LTA's theory of change, which anticipates a reduction in concerns over fallowing among households with CCROs due to their strengthened tenure security and possession of legal documentation of their land rights. Formalized land rights via the CCRO is also expected to reduce households' perceived vulnerability from fallowing by improving households' ability to defend their land from competing claims or attempts by local authorities to reallocate the land to others. This includes land they may choose to leave uncultivated or that otherwise appears in an unused state, which may be seen in many customary land contexts as especially vulnerable to competing land claims or reallocation by local authorities. Contrary to expectations, the IE endline results show little difference in perceived risks related to fallowing between the assignment groups, and regardless of whether households had any form of land documentation.

A comparison of respondents with and without a CCRO also provides little evidence to suggest an effect of the CCRO specifically on reducing this concern. At endline, 53 percent (n=303) of LTA households with CCROs reported a somewhat or very high risk of expropriation in the context of fallowing compared to 59 percent (n=49) of control group households with CCROs, and there was little change since baseline.

There was also little difference in the trends by gender of household head, with the exception of a greater uptick in perceived risk by male household heads who had not obtained land documentation by endline, especially for those in LTA villages. As shown in Figure 11, more than half of male and female household heads across both assignment groups at endline felt there was a “somewhat” or a “very high” risk of losing their land if they were to leave it fallow. Across both assignment groups and household head genders, the percentage of respondents who said there was a risk to fallowing *increased* between endline and baseline regardless of their land documentation status. A notable increase is observed for male household heads in LTA villages who by endline still reported having no form of land documentation, where 76 percent of such respondents felt there was a risk of losing land left fallow.

have sufficient funds to develop land use plans for all villages in the district, and CCROs can only be issued once a village has already gone through the VLUP process.

⁵¹ According to KIIs, LTA streamlined the VLUP process to enable DLO staff to complete the process for a village in 10 days rather than previous norm of 15-20 days. In general, LTA's support to help the DLO reduce the number of days and staff to accomplish a VLUP in a given village was seen as a major accomplishment, as was LTA's introduction of MAST and associated skills-related capacity building on the technology side. The training of para-surveyors within villages was also seen as highly important.

FIGURE 10: RISK OF LAND LOSS IF PARCELS ARE LEFT FALLOW

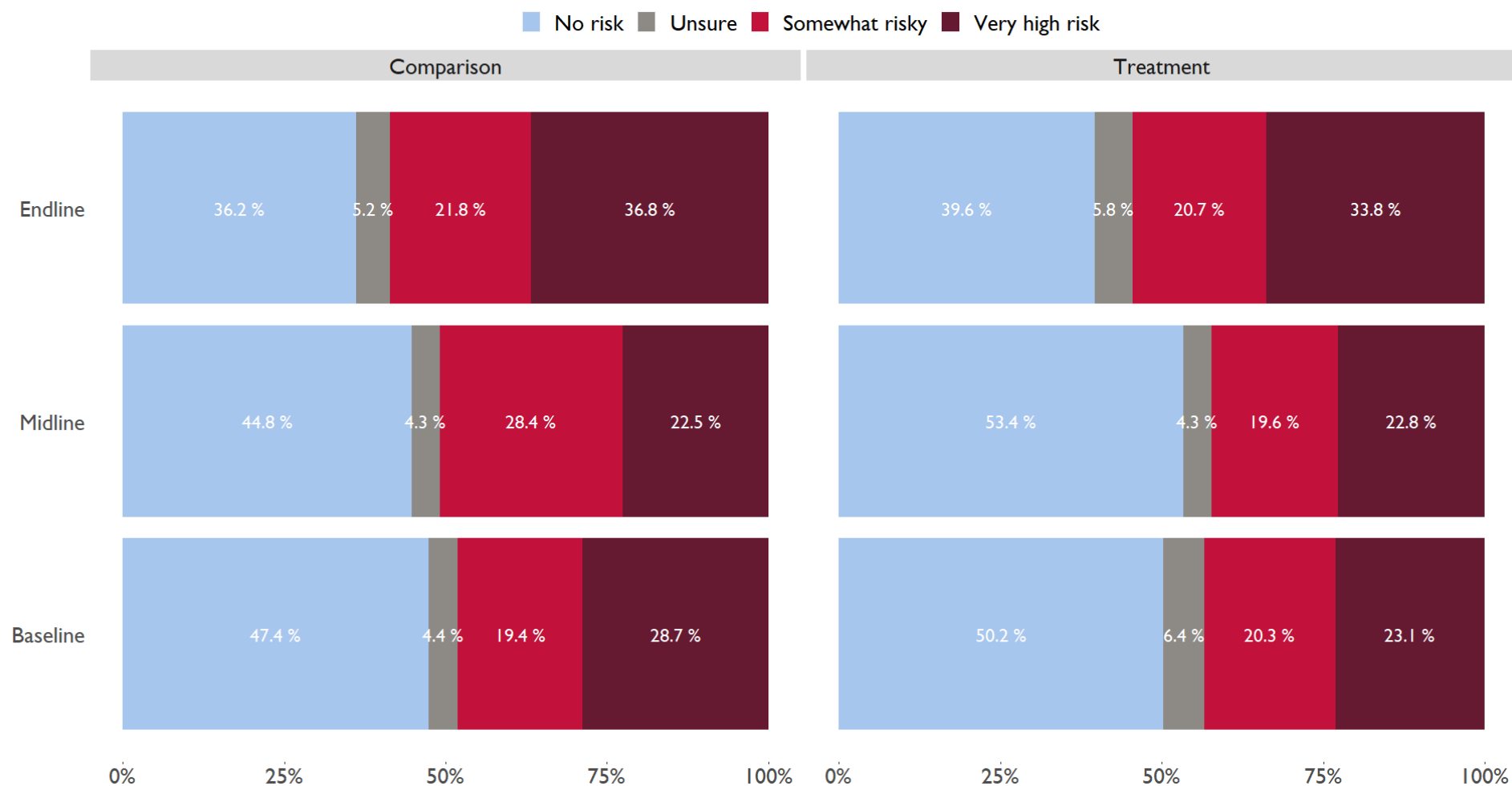
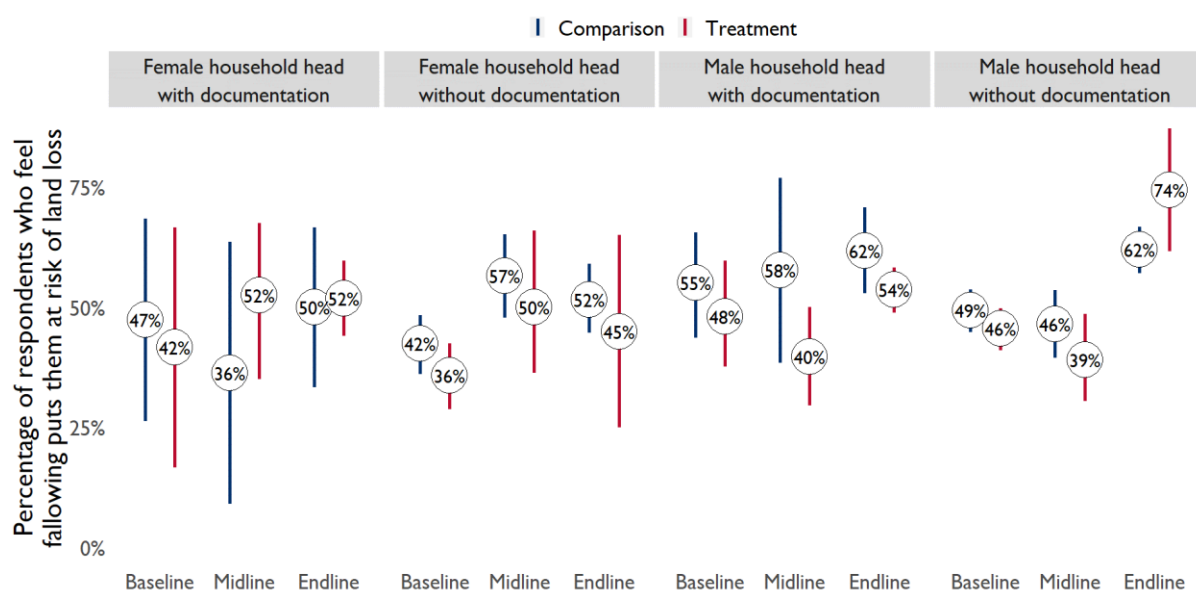


FIGURE 11: RISK OF LAND LOSS IF LAND IS LEFT FALLOW BY HOUSEHOLD HEAD GENDER AND DOCUMENTATION STATUS



The IE team conducted targeted follow up on this issue during qualitative data collection at endline, to inform interpretation of the results. Some interviewees acknowledged that a fear of losing land that is not actively used is still a concern for some villagers. The qualitative data suggested that the quantitative results on fallowing concerns may indeed relate to households' perceived vulnerabilities about losing land that appears to be in an unused state, and this is still a concern for at least some villagers irrespective of the protections that a CCRO might confer according to the law. The reasons for this concern vary and appear to include longstanding norms regarding the potential for the village or the state to reallocate undeveloped land for alternative uses, misinformation, and rumors or people's direct experiences regarding land grabbing by investors.

KIIs also indicated that such concerns by villagers may have some merit. According to KIIs with DLO staff, some village councils in Iringa District have been the source of expropriation for unused parcels held by individual villagers, although this does not appear to be widespread and did not to their knowledge occur in any LTA villages during the activity. KIIs indicated the village council as the typical source of such expropriation, rather than private entities or other government bodies. DLO staff noted that by law the government can take land from villagers to establish a public service or for other reasons, although the villager typically must be compensated. However, these interviewees also acknowledged that compensation is not always provided in a timely manner or at a level that satisfies villagers, and this may contribute to villagers' concerns.

A DLO staff member felt that LTA may have helped allay villagers' concerns about risks of losing land they are not actively using by providing trainings on land laws, policies, and individuals' rights under the law. One CDO respondent mentioned that in cases where unused land has been taken by the village and reallocated for another use, this must be done with the consent of the entire village through the village assembly. The interviewee gave an example in which the village consented to sell land to an investor, noting that any villagers who lost land through this process would be compensated by the investor or the village. However, the interviewee could not confirm whether the compensation had actually happened. Interviewee responses on this issue overall are consistent with the quantitative findings on perceived expropriation risks in the context of fallowing. The results suggest that despite evidence of villagers' general improvements to their tenure security during LTA, those gains did not extend to allaying customary landholder's perceived vulnerabilities about leaving land unused. Such land can still be appropriated by village authorities or more powerful actors, while the legal provisions or actual precedents for compensation could serve as a disincentive

for landholders. In this context, it also appears unlikely that tenure security gains will spur a greater incidence of fallowing as a result of obtaining a CCRO, despite expectations to the contrary.

“I think the fear [of losing land that is left fallow] is there if you have the parcel that is not mapped, left it for long time and you don’t have any documents, at the end of the day you do not have the right of saying its yours, especially if someone took it. Through legal ownership, villagers would have much [more] security as they will know exactly who owns the area legally and has legal ownership.” – KII with DLO staff

FAMILIARITY WITH LAND LAWS

The proportion of LTA respondents who reported familiarity with land laws increased from 7 percent (n=84) at baseline to 29 percent (n=308) at endline. The control group saw a similarly large increase over the same period, going from 4 percent (n=58) to 25 percent (n=288) of respondents who said they had familiarity with local land laws.

There was some variation on this within each assignment group, on the basis of CCRO status or respondent type. Of control group respondents who said they had any land documentation,⁵² 30 percent reported familiarity with the land laws, in contrast to 25 percent for the control group overall. Although LTA did not conduct sensitization on land laws in control group villages, self-reported familiarity with land laws was similar among CCRO holders in both assignment groups, with the exception of female household heads in LTA villages where it was lower, although the difference was not statistically significant.

Among primary spouses who reported having a CCRO, self-reported familiarity with land laws was also similar among the 71 such spouses in the control group (37 percent, n=21), and the 353 LTA spouses with CCROs (36 percent familiar with land laws, n=128). In LTA villages, where the activity conducted sensitization on land laws for all villagers, self-reported familiarity with land laws was also similar at endline among primary spouses who reported having a CCRO (36 percent, n=128) and those who did not have a CCRO (37 percent, n=28).

The descriptive results suggest that self-reported familiarity with land laws may be lower for female-headed LTA households in the sample, relative to male-headed households or primary spouses. However, the sample of female-headed households with CCROs is small in both assignment groups and differences are not statistically significant. Of the 23 female-headed households that reported having a CCRO in the control group, 30 percent (n=7) said they had familiarity with land laws at endline, compared with 16 percent (n=27) in the treatment group.

The endline results also highlight potentially important variations in familiarity with land laws within the LTA group by gender and respondent type. Among LTA households that received a CCRO, a slightly greater proportion of female primary spouses reported familiarity with land laws than the male households head (36 percent of wives compared with 27 percent of male heads). In LTA villages, reported familiarity was lowest among female-headed households with CCROs, where only 16 percent of such female heads said they were familiar with land laws. Among control group households, the lowest reported familiarity with land laws was also for a female headed subgroup: female household heads without CCROs, at around 10 percent (n=20).

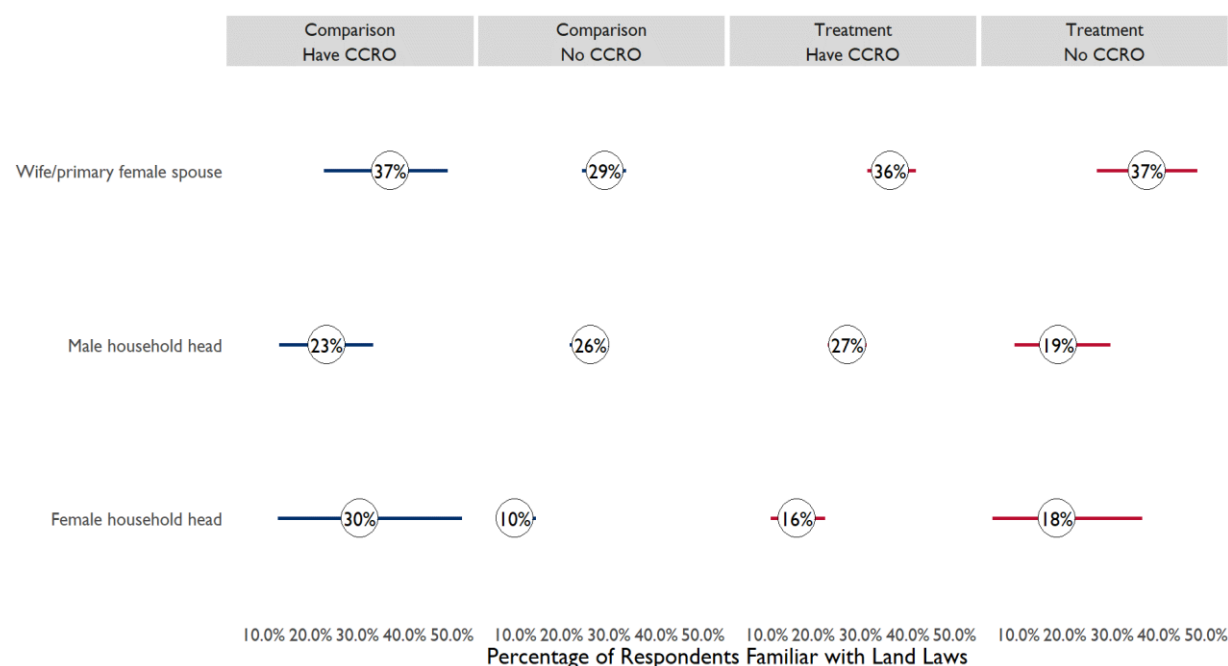
The IE team conducted qualitative follow up at endline on potential reasons for higher familiarity with land laws by female spouses relative to male household heads in LTA villages. Findings suggested that LTA’s emphasis and activities related to supporting women’s land rights could have contributed to stronger familiarity and knowledge of land rights for female spouses relative to male heads through women’s more frequent exposure to those issues or greater opportunity to participate in trainings or meetings that discussed this topic. However, the IE team is not able to explain why a smaller proportion of female-headed households appeared to express familiarity on these issues with

⁵² 140 control group respondents reported having CCROs at endline.

the available gender data, as LTA's participation data (reasonably) does not additionally disaggregate participants by household type. One possibility is that female heads may have had less time or ability to join such meetings, or more commonly sent others in their stead who may not have communicated the training information adequately.

LTA took several steps to strengthen knowledge of women's land rights, including airing radio programming on women's land rights throughout Iringa District and conducting women's trainings and women's group strengthening meetings that covered issues related to land laws and land administration in LTA villages. LTA staff noted that the content of LTA's women's sensitization meetings conducted in LTA villages was tailored specifically for a female audience, including promoting joint ownership of land⁵³ and highlighting the importance of women's participation in land demarcation, adjudication, and village assembly meetings that involve land issues. KIIs with LTA staff indicated that those trainings contained additional content focused on women's land rights, relative to meetings that were open to all members of the village. LTA's monitoring data also showed strong attendance at the women's sensitization and women's group strengthening meetings in many villages, and that LTA achieved gender parity in meeting attendance for several other types of meetings that LTA held in villages where it was operating, including at parasurveyor and demarcation training and attendance at hamlet-level meetings. Women's participation in village council meetings, however, was often notably lower. For example, LTA's tracking data show that women constituted 32 percent of attendance at village council meetings held in LTA villages during FY2019.⁵⁴

FIGURE 12: ENDLINE FAMILIARITY WITH LAND LAWS BY RESPONDENT TYPE, ASSIGNMENT, AND CCRO STATUS



IMPACT ANALYSIS RESULTS

The IE team's main estimation strategy for LTA's causal effects found some evidence of LTA having a positive and significant impact on tenure security. Perhaps unsurprisingly, LTA increased the likelihood that a household would have a CCRO by about 100 percent (OR 160, $p < 0.001$) relative to the control group. LTA also increased the WTP for CCROs among treatment households by

⁵³ LTA advised women on the type of occupancy and tenancy arrangements that are best suited for protecting their land rights. For husbands and wives, LTA promoted co-occupancy as joint tenants for land registration and CCRO issuance.

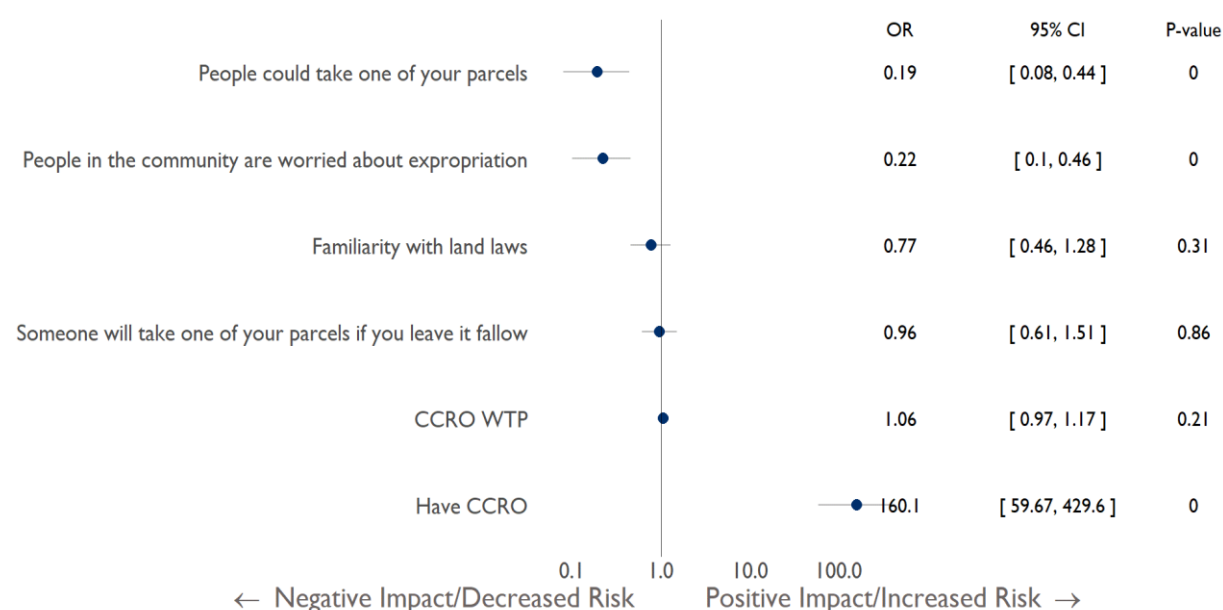
⁵⁴ LTA FY2019 annual report.

about 6 percent relative to control households on average, though this finding is not statistically significant ($p=0.21$) and is sensitive to model specification.

Controlling for household characteristics and local context variables such as distance to Iringa and settlement density, the impact estimation model found that LTA led to a 16 percent decrease on average in a household's probability of feeling tenure insecure (or a 1.6 reduction in the log-odds likelihood of tenure insecurity, $p=0.001$). Similarly, the IE team estimated an 18 percent decrease on average in a household's probability of feeling concerned about land expropriation within their community due to LTA relative to the control group ($p=0.001$, log odds = -1.5). These findings are consistent with the descriptive reporting above, but are estimated via statistical models that also account for other variables that may influence respondents' perceptions of tenure security.

Similar to the descriptive findings above, the IE team did not find evidence for a statistically significant impact of LTA on respondents' familiarity with land laws or their perceived risk of losing land that is left fallow. Inferential analysis suggests that LTA households had nearly equal odds of a perceived risk of losing land that is left fallow, relative to control group households (OR 0.96). Estimates of LTA's impact on respondents' familiarity with land laws also suggest no statistical difference between LTA and control households, on average, holding other household characteristics constant (OR 0.77). The confidence intervals for the estimates of LTA's impact on perceptions of fallowing risk and familiarity with land laws includes zero, suggesting that the true impact on these measures could be positive or negative (Figure 13).

FIGURE 13: ESTIMATES OF LTA'S IMPACT ON TENURE SECURITY INDICATORS⁵⁵



Estimates presented with robust 95% confidence intervals and with village fixed effects

DISCUSSION AND CONCLUSIONS

Endline results across most tenure security indicators suggest that landholders who received formalized documentation of their customary land rights through LTA assistance perceived their land rights to be more secure since baseline. The EQI findings suggest that LTA's CCRO provisioning had a positive impact on one of the earliest steps along the envisioned causal pathway

⁵⁵ The estimate on the continuous WTP outcome was centered at zero and divided by two standard deviations, and presented here as an OR. The point estimate of 0.06 (95 percent CI: -0.03, 0.15) was exponentiated in Figure 13 for consistency with the remaining binary outcomes presented in the figure.

for customary land formalization: strengthening landholders land rights and perceived land tenure security. The IE found strong evidence that landholders felt more secure in their land tenure within 2-2.5 years of receiving a CCRO. The LTA theory of change posits that this should lay the foundation for increasing sustainable agricultural investments on their land. Households experienced a significant decline in their perceived concern over land expropriation within the community in general, and also saw a decrease in their perceived risk of loss of their own parcels.

The EQI endline results also demonstrate strong effectiveness of LTA's systematic CCRO provisioning and point to several ways that customary landholders perceive their rights to be more secure. First, LTA contributed to a 100 percent increase in the likelihood that a household would have a CCRO. This translates to a 5.6 fold increase relative to the control group mean of 15 percent. The difference underscores that CCROs remain largely out of reach for typical rural households in the absence of a systematic village-wide support program. The confidence of villagers in the CCRO is also reflected in the higher average amount that LTA respondents were willing to pay for a CCRO, and LTA's significant and positive impact on perceived tenure security at the household level and within the community, as measured through perceived expropriation risk.

For some of the IE outcomes examined, the similarly positive change observed across LTA and control villages suggested that tenure security and land administration conditions have generally improved across Iringa District during LTA. The qualitative findings at endline suggest that LTA's broad capacity building to the DLO could plausibly have contributed to this result. Even with these observed general improvements to the tenure security context in Iringa, the impact analysis found significant impacts that are directly attributable to LTA's activities in villages.

LTA's positive impacts on perceived tenure security are consistent with other recent and rigorous studies of customary land formalization in sub-Saharan Africa. For example, a quasi-experimental study of customary land certification from Ethiopia found that customary land certification reduced households' perceived risk of land loss by 10 percentage points.⁵⁶ A land formalization RCT from Benin found a 27 percentage point increase in the likelihood of parcels having clear borders (which the authors used as proxy for tenure security) as a result of customary land mapping and demarcation.⁵⁷ An RCT of a customary land certification program in Zambia also found a small reduction in perceived expropriation risk.⁵⁸ However, an RCT of a customary land formalization program in Rwanda did not find evidence that the government's land regularization program reduced households' perceived expropriation risk, although that study found a positive impact on other downstream outcomes such as land-based investment (further discussed in EQ3).⁵⁹ It is also worth highlighting that some land formalization studies choose not to measure perceived tenure security, apparently assuming that land formalization will necessarily improve tenure security. Such studies focus instead on measuring outcomes further downstream in the causal chain such as land investments, productivity, and income.⁶⁰

One area in which the IE found little evidence for impacts is a household's perceived risk of land loss in the context of fallowing. Fallowing is an important productive investment that households can make to restore soil fertility and boost agricultural productivity, but the IE results showed that the practice is not widespread in the evaluation sample. Moreover, the results for perceived fallowing

⁵⁶ Deininger, K., D. Ali, T. Alemu. 2011. Impacts of Land Certification on Tenure Security, Investment, and Land Market Participation: Evidence from Ethiopia. *Land Economics* 87(2):312-334.

⁵⁷ Goldstein, M., Hounbedji, K., Kondylis, F., O'Sullivan, M., & Selod, H. (2018). Formalization without certification? Experimental evidence on property rights and investment. *Journal of Development Economics*, 132, 57-74.

⁵⁸ Huntington, H., A. Starosta, B. Ewing, N. Walter. 2018. Tenure and Global Climate Change (TGCC) Evaluation Report. USAID.

⁵⁹ Ali, D. A., K. Deininger, and M. Goldstein. 2014. Environmental and gender impacts of land tenure regularization in Africa: Pilot evidence from Rwanda. *Journal of Development Economics* 110: 262-275.

⁶⁰ Higgins, D., Balint, T., Liversage, H., & Winters, P. 2018. Investigating the impacts of increased rural land tenure security: A systematic review of the evidence. *Journal of rural studies*, 61, 34-62.

risk suggest that household concern over losing land that is left fallow increased during LTA, in contrast to other measures of tenure security. This pattern of increased concern over fallowing was observed among households in both assignment groups and regardless of respondents' land documentation status or the gender of the household head – with the exception of a greater uptick in perceived risk by male household heads who had not obtained land documentation by endline, especially for those in LTA villages.

Taken together, the findings suggest that land expropriation concerns in the context of fallowing remained widespread or even increased in recent years in Iringa District communities, irrespective of LTA treatment, gender, household possession of any form of land documentation, or CCROs specifically. Moreover, the results suggest the distinction between having *any* form of land documentation and a CCRO specifically may not matter for assuaging concerns about land loss from fallowing, even while other indicators of tenure security that this IE measured show improving trends and positive impacts as a result of the CCRO. The endline KIIs suggested that households' perceived vulnerabilities about losing land that appears to be in an unused state is still a concern for at least some villagers, irrespective of the protections that a CCRO might confer according to the law. Interviewee responses on this issue are also consistent overall with the quantitative findings on perceived expropriation risks in the context of fallowing.

As a result, there was little evidence that CCROs had effectively reduced concerns about losing land that households are not actively using. The results suggest that despite evidence of villagers' general improvements to their tenure security during LTA, those gains did not extend to allaying customary landholder's perceived vulnerabilities about leaving their land unused. Such land can still be appropriated by village authorities or more powerful actors, while the legal provisions or actual precedents for compensation in that circumstance could serve as an additional disincentive for landholders. In this context, it also appears unlikely that tenure security gains will spur a greater incidence of fallowing as a result of obtaining a CCRO, despite expectations to the contrary via the LTA theory of change.

It is also important to comment here on findings for the small group of LTA respondents who did not obtain a formalized land documentation by endline, in contrast to their village peers. This subgroup of LTA respondents has some important contrasts with their village peers that suggests they may not perceive their land rights to be secure, and perhaps more so now that they have seen their village peers benefit from the land formalization process. The average reported WTP for this group was more than double that of households who did receive formalized documentation of their customary land rights through LTA's support, suggesting even stronger valuation of the document by those who did not receive it in treatment villages. KIIs with LTA and DLO staff provided insights on why some LTA households or individuals did not receive a CCRO, and the DLO's standard process in cases where land claims were denied.

Those qualitative results, in conjunction with the higher WTP, raise the possibility that the small group of LTA households that did not receive CCROs out of LTA's systematic village-wide land formalization process may feel heightened vulnerability or greater tenure insecurity as a result. Indeed, uneven distribution of CCROs within villages has been previously identified as a potential source of tenure insecurity and mode by which land distribution inequities could be reinforced.⁶¹ On the whole, however, LTA's systematic village-wide approach appears to have successfully avoided both a gender-biased or a demand-driven process for land formalization, and there was no evidence of greater access to CCROs by those within villages who were better connected, had greater resources or knowledge to navigate the process, or other characteristics that are often seen to exacerbate land inequalities rather than engender village-wide improvements to tenure security as observed here.

⁶¹ Sundet, G. 2004. The politics of land in Tanzania [PhD thesis]. University of Oxford.

EQ2: TO WHAT EXTENT ARE LANDHOLDERS WHO HAVE RECEIVED FORMAL LAND DOCUMENTATION THROUGH THE ASSISTANCE OF LTA LESS LIKELY TO EXPERIENCE LAND DISPUTES?

Key Findings for EQ2

- **Dispute prevalence:** The impact analysis suggests that LTA's support to CCRO provisioning reduced the odds that a household experienced a land dispute in the previous 6 months by about 28 percent (OR 0.4, $p=0.03$). While the percentage of households reporting a dispute fell across both assignment groups, LTA households experienced a sharper decline.
- **Dispute duration:** The impact analysis does not find evidence for a statistically significant impact of LTA on the duration of disputes experienced by households, but these results should be interpreted with caution given the low prevalence of reported disputes in each survey round. While LTA households reported shorter disputes on average relative to control group households, there is also much higher variation in the reported dispute length among control group households at endline.
- **Dispute type:** The most common type of land dispute that households reported did not change over time, irrespective of assignment group. For both groups, disputes were most commonly reported for land the household already owned rather than land it was newly trying to acquire or land that was related to inheritance issues, rented in, or used for communal grazing.
- **Perceived likelihood of a future boundary dispute:** LTA's activities are estimated to have reduced the probability that respondents felt they could experience a boundary dispute in the next 5 years by about 32 percent (OR 0.48, $p=0.00$). LTA households were on average less concerned about future border disputes compared to control households relative to baseline.
- **Role of land documentation in how households view disputes:** CCRO documentation via LTA appears to have changed whether and why households think about future dispute risk. By endline, 66 percent of LTA households ($n=395$) that were not worried about future boundary disputes said it was because their household had documentation of land rights.

EQ2 considers the extent to which LTA's CCRO provisioning resulted in changes to the prevalence, duration, and type of land disputes that household's experience, together with their outlook on future disputes. The IE team focused on the following four indicators that sought to measure whether and the magnitude by which LTA reduced the prevalence of land disputes in LTA villages and a household's perceived risk of experiencing future land disputes.

- **Prevalence of land disputes:** Respondents' self-reporting on whether anyone in the household had been involved in a land dispute during the past six months.
- **Duration of land disputes:** Length of the dispute from start until resolution, as reported in months by the households.
- **Type of land dispute:** Broad classification of the type of land dispute according to whether the dispute applied to land the household already owned rather than land the household was newly trying to acquire, or land that was related to inheritance issues, rented in, or used for communal grazing. Followed by additional probing on the nature of the dispute that varied by each of these broad categories.
- **Perceived likelihood of experiencing a future boundary dispute:** Respondent's view on the possibility of experiencing a boundary dispute on any parcel within the next five years.

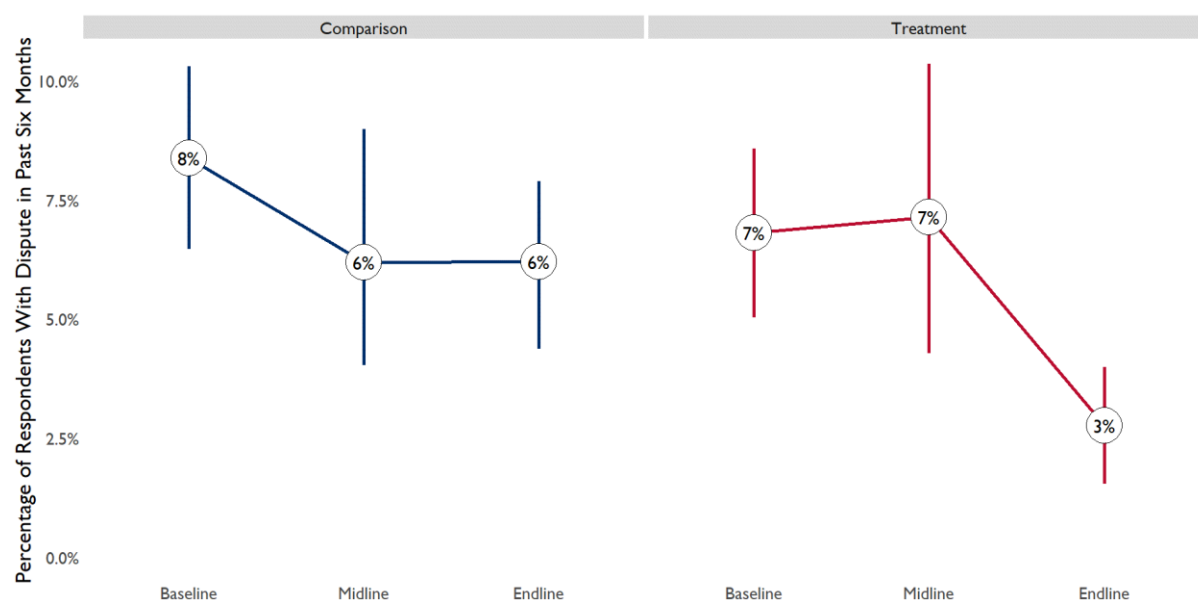
SUMMARY OF DESCRIPTIVE FINDINGS

DISPUTE PREVALENCE

The percentage of households that experienced a land dispute fell from baseline to endline across both assignment groups, but LTA households experienced a sharper decline. Across each survey round, households were asked whether they had experienced a land

dispute in the previous six months. Overall, the prevalence of land disputes was fairly low in each round. The proportion of control group households that reported a dispute declined from 8 percent (n=70) to 6 percent (n=44) between 2017 and 2020. Over the same period, the proportion of LTA households that reported a land dispute fell from 7 percent (n=50) at baseline to 3 percent (n=18) at endline.

FIGURE 14: AVERAGE DISPUTE PREVALENCE BY ROUND AND ASSIGNMENT



At endline, both treatment and control group households reported an average of 1.1 disputes (treatment n=20, comparison n=49), and no respondent in either assignment group reported experiencing more than 2 disputes in total. These quantitative results align with qualitative data on dispute prevalence obtained at endline and are supported by interviewees' perceived improvements of DLO capacity to respond to disputes as a result of LTA's support. Both LTA and DLO staff were somewhat surprised at the low level of disputes encountered during LTA's implementation. They highlighted that most disputes encountered were between villages and often stemmed from hastily defined village boundaries that had been drawn up through previous village demarcation processes. LTA worked with the DLO to address these inconsistencies in neighboring village boundaries as part of the VLUP process before mapping and demarcating individual parcels within villages. In such cases, LTA worked with the DLO to conduct inter-village mediation with villages adjacent to LTA villages as part of the VLUP process, working with village councils from the adjacent villages to obtain agreement on village boundaries and in some cases rectifying village boundaries.⁶²

KIIs with LTA, DLO, and CDO staff also called attention to LTA's support to increase the DLO's capacity to respond to disputes and to improve the efficiency of the VLUP process. While this could also be reflected in LTA villagers' reduced concerns around future disputes, staff from both offices also mentioned high turnover as a challenge to sustaining the Iringa DLO's improved capacity.

"The reduction in land disputes as a result of MAST and empowering the DLO is not really so much about individual disputes, but [disputes] between villages" – KII with LTA chief of party

⁶² According to LTA, it was only necessary to resurvey the village boundary in one of these cases.

“We had many land disputes on [village] boundary issues and LTA helped us to do boundary verifications to make sure the disputes are resolved.” – KII with DLO department head

“When LTA came on board, they used to walk from one village to another to look at the new map and where there were conflicts they would call up meetings and involve all the villagers in order to come up with an understanding and to put boundaries that are real. They have done well and have played a good part too and since they used to walk village to village this made the DLO staff know more [about the] boundaries of the villages and mostly those [that were] under the LTA project.” – KII with CDO staff

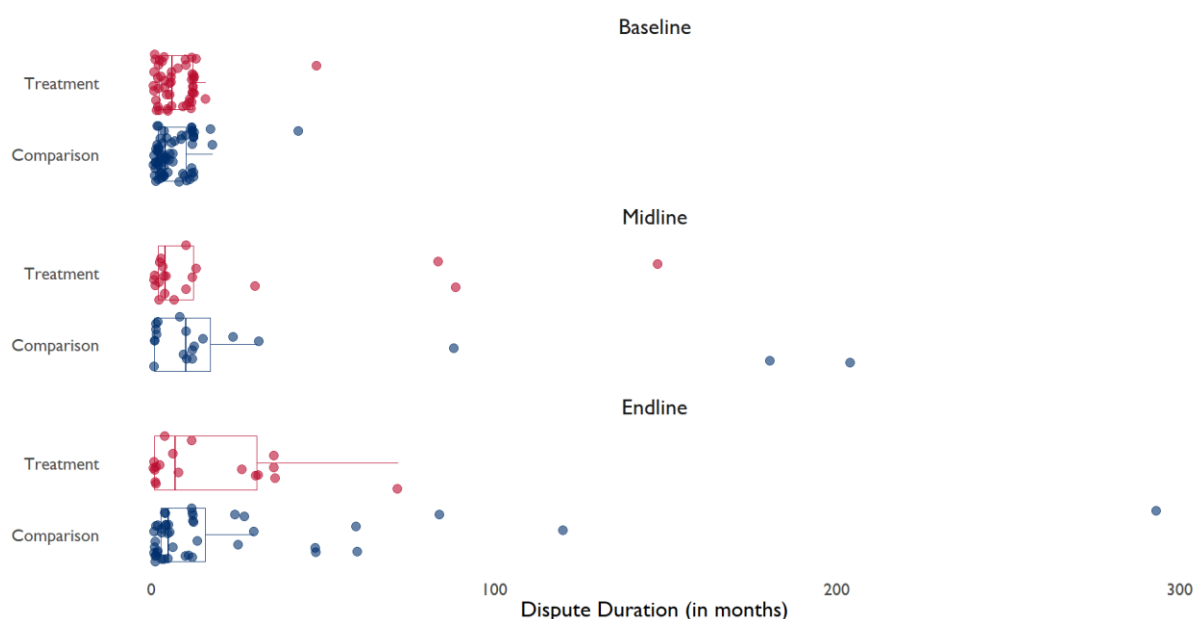
DISPUTE DURATION

While the overall proportion of LTA households that experienced a land dispute was smaller at endline, the average dispute duration increased among households in both assignment groups that reported a dispute at endline. LTA households appear to have experienced shorter disputes on average relative to control group households, although results should be interpreted with caution due to high variation in reported dispute length among control group households at endline. At baseline, LTA respondents (n=50) and control group respondents (n=70) who had experienced a land dispute reported a similar average dispute durations of 7.7 months (sd = 7.3) and 6.3 months (sd = 6.3), respectively. At endline, the 18 treatment respondents with disputes reported an average duration of 17 months (sd = 20) while control group respondents reported an average of 23 months (sd = 49). The high variation in the reported dispute duration among control group respondents at endline was driven by five respondents from five villages who reported disputes that exceeded four years at endline. While this is certainly possible, these disputes were not reported at baseline and the more likely explanation for these control group outliers at endline is either enumerator measurement or respondent reporting error.⁶³ Dropping these 5 cases, the average dispute duration at endline for the comparison group was 9.7 months (sd = 12).

Overall, this highlights two key takeaways. First, respondents may not always accurately report the duration of their disputes. This may not be deliberate, but could simply be the result of how people conceptualized dispute length, for example. As shown in Figure 15, the range of reported dispute lengths expanded between baseline and endline. Second, even if extreme and potentially erroneous dispute lengths are removed from the sample, the average dispute length in the treatment group apparently increased between baseline and endline, even as the number of respondents reporting a dispute fell. This likely reflects, as also supported by KIIs with LTA staff, that the small number of disputes that continued to occur during LTA’s support for dispute resolution in LTA villages were those that were more intractable or difficult to alleviate.

⁶³ Further adding to the likelihood of this, only one of these respondents one of the non-LTA household respondents who reported an extremely long dispute at endline (120 months) reported *no* disputes at baseline.

FIGURE 15: DISPUTE DURATION BY ROUND AND ASSIGNMENT



DISPUTE TYPE

The most common type of land dispute that households reported did not change over time for both LTA and control group households. Keeping in mind that the number of reported disputes was low overall, the most commonly reported type of dispute at each survey round was for land the household currently owned (accounting for 63.2 percent of disputes experienced by LTA households and 70.2 percent of disputes experienced by control group households at endline), rather than for land the household was newly trying to acquire, that related to inheritance issues, or was rented in or used for communal grazing. The second most common type of land dispute reported at baseline and endline was over a land inheritance issue, cited for 26 and 19 percent of the disputes reported at endline for LTA and control group households, respectively.

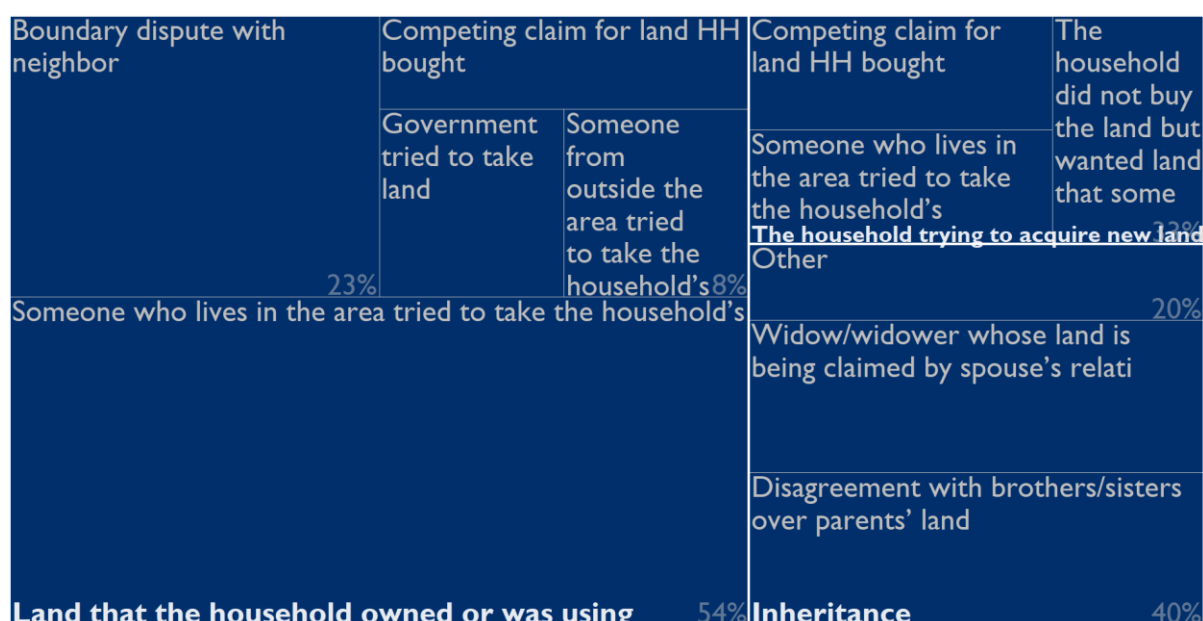
Within these broad categories, the household survey asked respondents for more details about the nature of the dispute. Figure 16 shows the baseline context for land disputes among LTA households. Among the reported disputes over land that households owned or used at baseline, the most common nature of the dispute cited was another person within the community trying to take the land (50 percent, n=14) followed by a boundary dispute with a neighbor (32 percent, n=9). For inheritance-related land disputes, the most common context for the dispute was a disagreement among siblings over land to be inherited from parents (50 percent, n=5) followed by relatives claiming a widow's land for themselves (40 percent, n=4).

FIGURE 16: TREATMENT GROUP BASELINE DISPUTE DESCRIPTIONS



By endline, the number of disputes that LTA households reported declined substantially while the dispute context remained similar to that at baseline. In other words, while the proportion of LTA households that experienced disputes in the six months prior to endline was nearly a third of the households that did so at baseline, there was no material change in the nature of disputes experienced. The most common context at endline for disputes over land the household currently owned or used remained another person within the community trying to take the household's land (54 percent, n=7) followed by a boundary dispute with a neighbor (23 percent, n=3) (Figure 17). For inheritance-related disputes at endline, the most common context was relatives claiming a widow's land (40 percent, n=2), followed by disagreements among siblings over land to be inherited from parents (40 percent, n=2). These descriptive breakdowns are informative for examining potential changes to the nature of ongoing land disputes in the LTA study area. However, the total number of disputes reported by endline was low and too small to conduct comparative statistics that are further disaggregated by these sub-categories.

FIGURE 17: TREATMENT GROUP ENDLINE DISPUTE DESCRIPTIONS

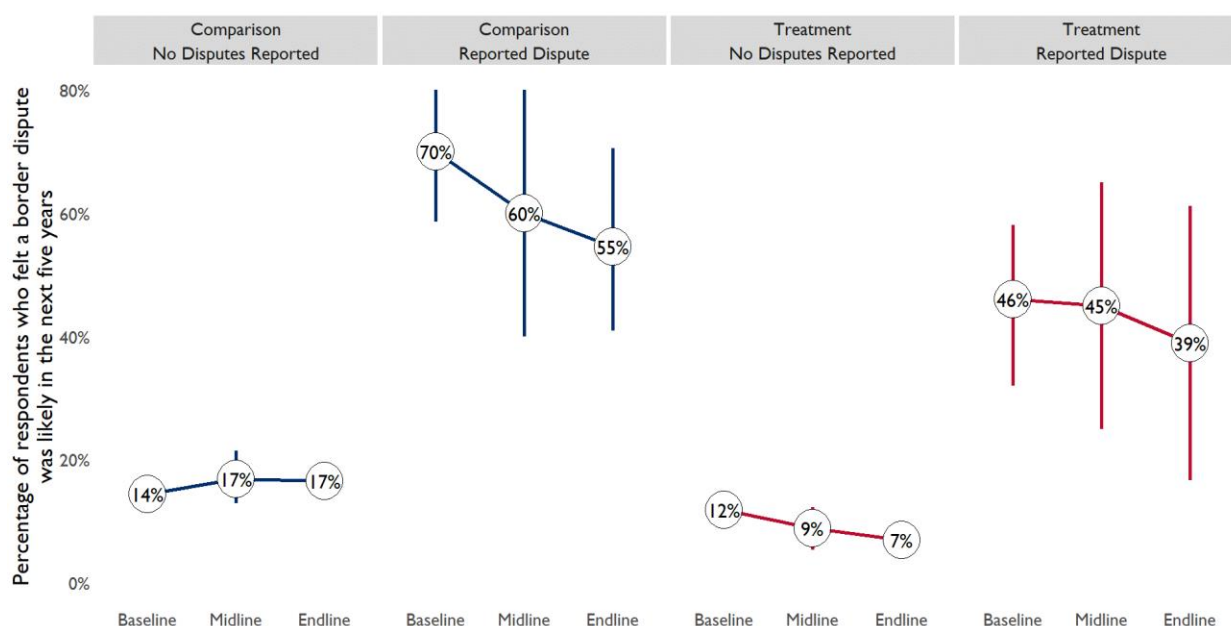


LIKELIHOOD OF FUTURE BOUNDARY DISPUTE

Respondents were also asked if they thought they could have a boundary dispute at some point in the next five years. **The percentage of households that thought a future boundary dispute was possible fell over time among LTA households.** At baseline, 14 percent of LTA households (n=104) and 19 percent of control group households (n=159) felt a border dispute was possible in the next 5 years. By endline, 8 percent of LTA households (n=51) felt the same. While there was a small decline within the control group, it is within a rounding error (18.9 percent, n=134) and not statistically or practically significant.

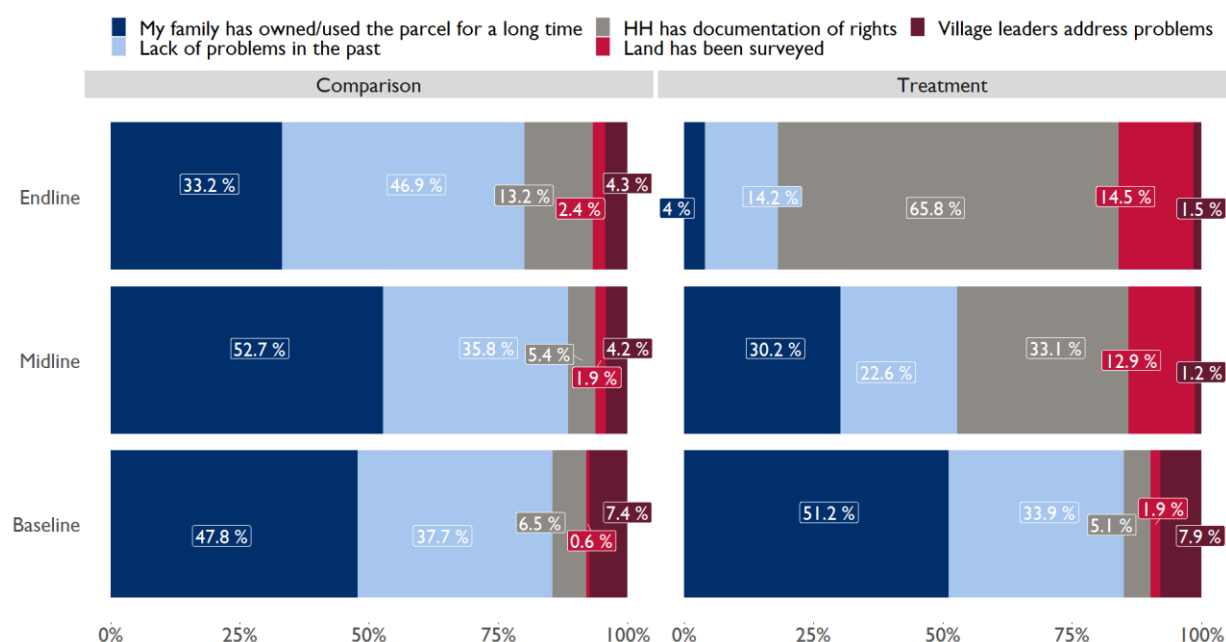
As shown in Figure 18, respondents varied in how they weighed their future dispute risk depending on whether they had already experience a land dispute. For both assignment groups, concern about the perceived risk of a future boundary dispute was substantially higher for the small group of respondents who previously had experienced a land dispute. While both such groups experienced a decline in this perceived risk during LTA, the magnitude of this decline was greater for LTA respondents (from 46 percent, n=23, to 39 percent, n=7) than for control group respondents who had experienced a dispute and felt a boundary dispute was possible in the future (from 70 percent, n=49, to 55 percent, n=24).

FIGURE 18: CONCERNS ABOUT FUTURE BOUNDARY DISPUTES BY ASSIGNMENT AND PAST DISPUTE PREVALENCE



CCRO documentation through LTA also appears to have altered the reasons why households did or did not worry as much about future dispute risks. At each round respondents who said they were *not worried* about border disputes in the next five years were asked to provide the main reason why. As shown in Figure 19, the main reason LTA households that did not worry about future boundary disputes cited at baseline was their family had owned or used the land for a long time (51 percent of LTA households, n=323). By endline, 66 percent of LTA households (n=395) that were not worried about future border disputes said it was because their household had documentation of land rights. The control group also saw an increase in the percentage of households that cited documentation of land rights as a reason for not worrying about border disputes, but the increase was not nearly as large (from 7 to 13 percent).

FIGURE 19: REASONS CITED FOR NOT WORRYING ABOUT FUTURE BORDER DISPUTES BY ASSIGNMENT GROUP



IMPACT ANALYSIS RESULTS

As shown in Figures 20 and 21, the IE found evidence of LTA's positive and significant impact on two of the four land dispute outcomes measures assessed: the likelihood a household experienced land dispute in the previous six months and their perceived risk of experiencing a future land dispute. However, the impact estimates for LTA's effects on land disputes must be interpreted with caution, given the low prevalence of land disputes reported in each survey round in which less than 10 percent of households in either assignment group reported a dispute (and falling to less than 3 percent of LTA households by endline). Keeping this in mind and controlling for household characteristics and baseline education levels, the impact analysis suggests that LTA's support to CCRO provisioning reduced the probability that a household experienced a land dispute in the previous 6 months by about 29 percent (log-odds=-0.90, $p=0.03$). LTA also positively impacted households' perceived risk of experiencing a future land dispute. Controlling for household characteristics, LTA's activities are estimated to have reduced the probability that respondents felt they could experience a boundary dispute in the next 5 years by about 32 percent (log-odds = -0.73, $p=0.00$). LTA's causal effect on this metric is reinforced by the pattern of descriptive results reported above, where LTA households experienced a significant decline in perceived risk while the proportion of control group households that felt they could experience a future a boundary dispute stayed the same between baseline and endline (no significant different over time).

The main estimation strategy for the impact analysis did not find evidence for a statistically significant impact of LTA's activities on the number of disputes reported or on the duration of disputes that households experienced. However, the proportion of households that had experienced a land dispute was small and there was little variation in the number of disputes reported by such households, with most respondents reporting only a single prior dispute. For this reason, the IE focuses on the binary measure of whether the household had experienced a prior dispute rather than the number of unique disputes, the results of which are both practically and statistically significant.

FIGURE 20: ESTIMATES OF LTA'S IMPACTS ON LAND DISPUTE BINARY INDICATORS

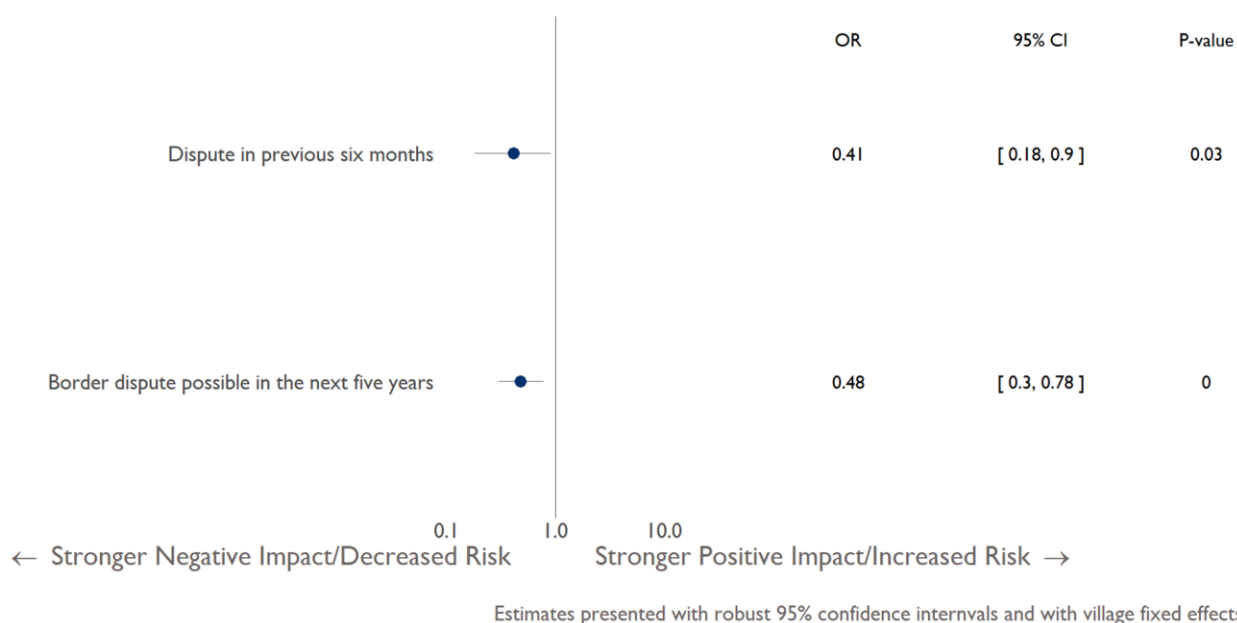
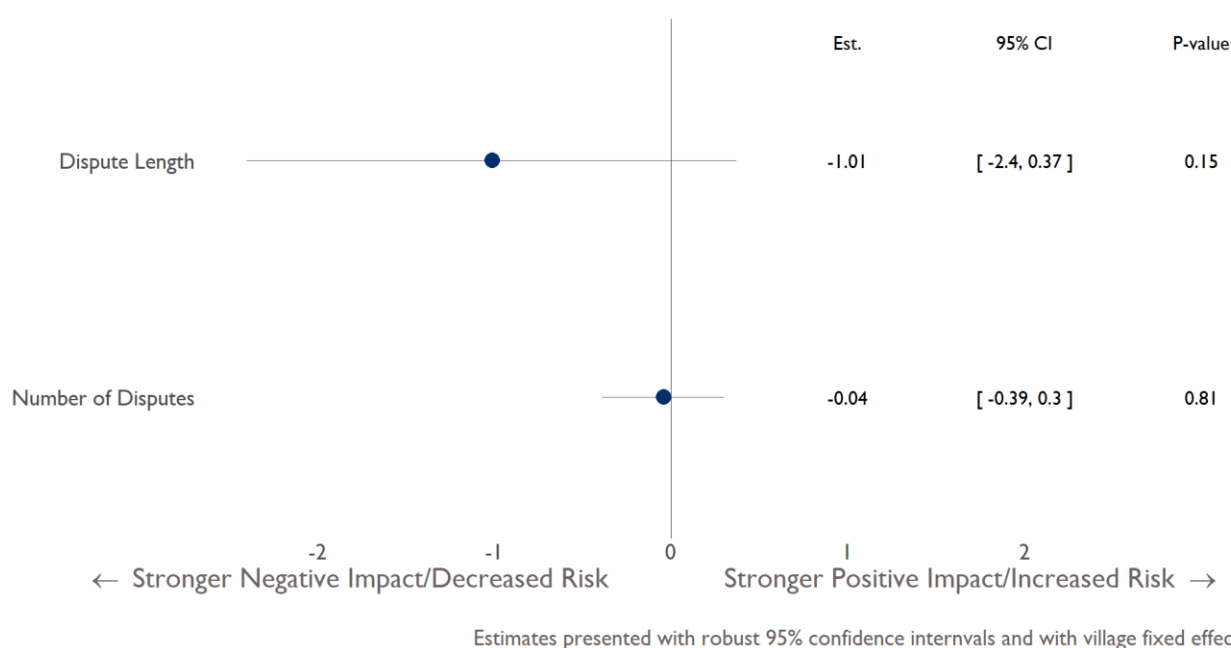


FIGURE 21: ESTIMATES OF LTA'S IMPACT ON CONTINUOUS LAND DISPUTE INDICATORS



DISCUSSION AND CONCLUSIONS

The IE findings for EQ2 provide strong evidence that LTA's support for CCRO provisioning, which is inclusive of the VLUP process in villages, reduced the likelihood that LTA beneficiaries experienced a land dispute in the six months prior to endline as well as their perceived risk of experiencing a future land dispute. However, the IE did not find evidence that LTA changed the nature of land disputes that households typically experience or the time it may take for such disputes to be resolved. Going forward, disputes that do occur appear likely to remain centered on four common types of issues: competing claims to land by members of the same community, boundary disputes among neighbors, widow's land rights, and inheritance disputes among siblings.

While such disputes may still occur even when households possess a CCRO, it is important to note that the overall incidence of such disputes in the study area was already quite low at baseline and had become even less common by endline. Disputes that were still ongoing in LTA villages by endline appeared to be those that were particularly difficult to resolve, as indicated by their longer duration and ongoing status despite LTA and the DLO's explicit focus and support for dispute resolution in those villages. On net, however, the significant and positive effect of LTA's CCRO provisioning on the likelihood of a household experiencing a land dispute at all is an important indication that customary land formalization has at least somewhat helped resolve underlying conflicts and uncertainty over land ownership and use in LTA villages.

In addition to LTA's significant impact on reducing the likelihood that a household experienced a land dispute (in the six months prior to survey), the IE also found a positive impact of the activity on households' perceived risk of experiencing a future boundary dispute. Survey results also suggested that households viewed the formalized land documentation they received through LTA as a key reason for their reduced concerns over future boundary disputes. Qualitative findings suggested this improved outlook over future land disputes could also have been bolstered by the DLO's increased capacity to respond to and mediate disputes that was gained through LTA's support.

On the whole, these results build on those from EQ1 in providing further indication that LTA's CCRO provisioning has produced the anticipated impacts for short-term steps along the envisioned causal pathway from land tenure strengthening through customary land formalization to improved household economic wellbeing.

It is also worth noting that although land formalization is expected to eventually reduce land disputes, those effects are not always seen within the short timeframe encompassed by this endline. Instead, many studies suggest or show that land formalization can actually increase land disputes, particularly during and shortly after the formalization process and if the intervention is not appropriately embedded within existing local institutions. In particular, this may be possible where interventions have not provided sufficient strengthening of local land governance institutions or a functional grievance mechanisms is in place.⁶⁴ Taken together with the qualitative evidence from EQ1 on LTA's capacity building with the DLO, the IE results for EQ2 on land disputes suggest that LTA's efforts to work directly with the DLO to embed sustainable land formalization processes in the relevant local authorities, together with their adoption of a participatory approach for the process in villages via the MAST approach, may have helped avoid this type of negative outcome.

EQ3: TO WHAT EXTENT DO LANDHOLDERS WHO HAVE RECEIVED FORMAL LAND DOCUMENTATION THROUGH THE ASSISTANCE OF LTA CHANGE THEIR INVESTMENT AND LAND USE DECISIONS IN A MANNER THAT REFLECTS STRENGTHENED INCENTIVES RESULTING FROM INCREASED TENURE SECURITY?

Key Findings for EQ3

- **Land investments:** There was no evidence of an increase in land-based investments due to LTA's CCRO provisioning. Land-based investments or productivity-enhancing improvements increased across both treatment and control groups. The LTA households that reported making land-based improvements did so across four of the five categories assessed.
- **Use of fertilizer:** There was no evidence of an increase in fertilizer use due to LTA's CCRO provisioning. Fertilizer use increased across both treatment and control groups, from 52 percent of households at baseline to 75 percent at endline for LTA households and 72 percent for control group households.

⁶⁴ Higgins, D., Balint, T., Liversage, H., & Winters, P. 2018. Investigating the impacts of increased rural land tenure security: A systematic review of the evidence. *Journal of rural studies*, 61, 34-62.

- **Prevalence of tree planting (fruit and non-fruit trees):** The impact analysis found LTA had a significant positive impact on fruit tree planting, but this was not robust to alternative model specifications. There was a slight increase in household planting of non-fruit tree crops across LTA and control group villages, with a larger increase for LTA households from 21 to 26 percent of households reporting tree planting.
- **Fallowing:** There was no evidence LTA had a causal impact on the likelihood of a household fallowing one of their land parcels. Fallowing is not widespread, at 18 percent of households at endline for both assignment groups, and the percentage of households that reported fallowing any of their parcels did not change in either group. The incidence of fallowing was higher for households that controlled more than three land parcels, across both assignment groups, but also showed a declining trend over time. Households with three or fewer parcels were much less likely to have left any parcels fallow. The fallowing incidence among such households was similarly low across survey rounds, and was 14 percent at endline for both assignment groups.
- **Crop diversification:** There was no evidence LTA's CCRO provisioning had an effect on crop diversification. The number of crops planted increased across both assignment groups. At endline, LTA households reported growing 2.6 different permanent crops and control group households reported farming 2.4 permanent crops, on average.
- **Total landholdings:** There was no evidence LTA's CCRO provisioning had an effect of on total landholdings. Total landholdings did not meaningfully change between baseline and endline for LTA households and declined slightly for control group households. At baseline and endline, LTA households reported a median of 2 parcels, while control group households reported a median of 1.75 parcels at baseline and 1.3 parcels at endline. At baseline, the average parcel size was 1.6 hectares for LTA and 1.2 hectares for control group households. This decreased to an average parcel size of 1.3 hectares for LTA households and 0.8 hectares for control group households.
- **Use of communal land:** Use of communal land increased across both assignment groups, but the increase was larger for LTA villages than for control group villages, going from 29 percent at baseline to 37 percent of households at endline. Use of communal land by control group households did not change between baseline and endline. LTA households that made investments in their own land reported using communal pasture land at a higher frequency than comparison households or other LTA households that did not make land-based investments.

Formalization of customary land rights is expected to motivate landholders to increase their agricultural investments in ways that boost their productivity and eventually improve their economic wellbeing. In the LTA context, household receipt of formalized documentation of their customary land rights via a CCRO is thus anticipated to lead to households changing their land use and investment behavior in ways that promote greater agricultural productivity and value of the land over the long term. EQ3 examines the extent to which LTA households made new or additional types of productivity-enhancing land investments or changed the nature of their land-use behavior. The IE sought to measure whether and the magnitude by which LTA elicited change on the following indicators of productivity-enhancing investments and household land use:

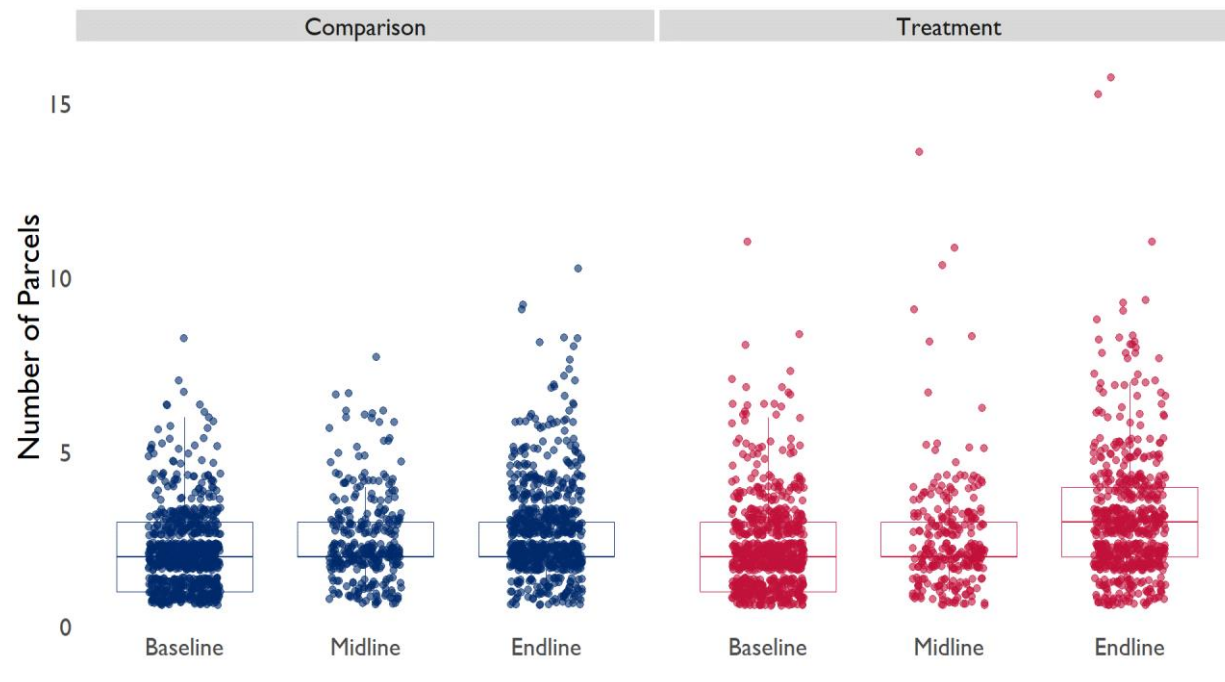
- **Land-based investments:** respondents' self-reporting on whether they made any of five land-based improvements to any of their parcels over the two preceding years: digging wells or installing a pump irrigation system, constructing new buildings, constructing fencing, constructing terraces, and applying soil conservation measures.
- **Use of fertilizer:** respondents' self-reporting on whether they applied fertilizer on any of their parcels during the last agricultural season.
- **Prevalence of tree planting (fruit and non-fruit trees):** a binary variable equal to one if respondents self-reported planting one or more fruit or non-fruit trees.

- **Fallow:**⁶⁵ respondents' self-reporting whether they left any of their parcels fallow during the previous year's agricultural season.
- **Crop diversification:** the number of different crops that were grown across all the household's parcels, including subsistence crops, cash crops, and any fruit or other tree crops.
- **Total landholdings:** the sum area of land owned or used by the household, including land rented in but excluding land rented out, self-reported by the respondent.
- **Use of communal land:** a measure of whether the household used communal pasture land as an indicator of household reliance on communal grazing areas.

PARCEL CONTEXT

This section provides additional details on the parcel context in the sampled villages, as trends on this may help inform the interpretation of how land-based investments that households reported may vary across and within assignment groups and survey rounds. Across each data collection round, respondents were asked about the number of parcels the household owned or rented in, and the size of each individual parcel used by the household.⁶⁶ Households in both assignment groups reported owning or renting about the same number of parcels within each data collection round, with a median of two parcels reported at baseline and midline and three parcels reported at endline for LTA households, with no change for control group households. A few outlier LTA households at endline resulted in about the same mean number of parcels for LTA households at endline overall, at 3 parcels compared to 2.8 parcels for the control group (Figure 22). Households with more than 3 parcels at endline were larger on average, with 5.6 and 6.0 household members in the treatment and control groups, respectively, while those with 3 parcels or fewer had an average of 4.4 household members regardless of assignment group.

FIGURE 22: NUMBER OF PARCELS USED BY THE HOUSEHOLD, BY ROUND AND ASSIGNMENT



⁶⁵ Fallow is treated as an important productive investment that households can make as a way to restore soil fertility and boost agricultural productivity.

⁶⁶ Potential data collection challenges and reliability issues with farmer self-reporting of parcel areas are well known for smallholder agricultural surveys. However, this approach is often the most cost-effective option for large-scale surveys, despite potential limitations and typically noisy estimates. (There are many definitions for noise in a data set. Here, the IE team mainly refers to outliers and misrepresentations of self-reported characteristics, whether deliberate or not, which result in a large range of responses that likely differ from the true value.)

While the number of parcels that households reported they used stayed similar over time, the reported parcel size varied across survey rounds and for both assignment groups. This variation held for the treatment group regardless of respondent gender and for households with more or fewer than three parcels. The median parcel size treatment households reported at baseline was around 1 hectare, but 0.6 hectares at endline.⁶⁷ Similarly, the median parcel size was around 1 hectare at baseline for the control group and 0.4 hectares at endline.

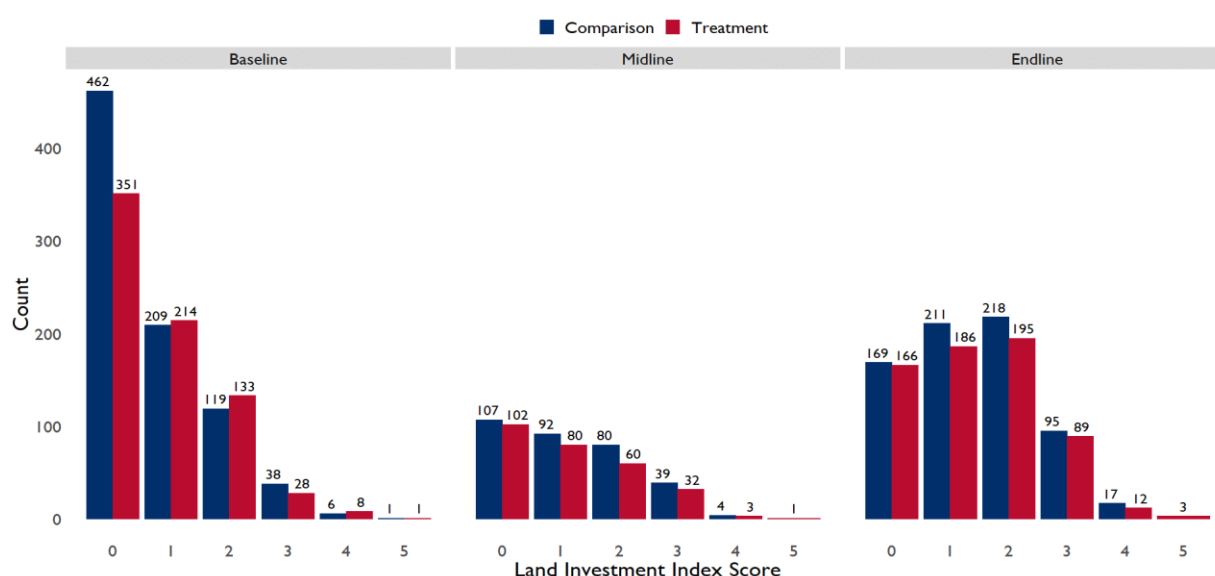
SUMMARY OF DESCRIPTIVE FINDINGS

LAND-BASED INVESTMENT

Overall, land-based investment increased between baseline and endline across both assignment groups. The average percentage of LTA households that reported making a land-based investment or productivity-enhancing improvement increased between baseline and endline across four of the five categories assessed. Household heads were asked about digging wells or installing pump irrigation systems, installing fencing, building construction, terracing, making soil conservation improvements, and fruit and non-fruit tree planting.

The IE team created a land investment index that condensed the five measures of parcel investment into a simple 0 through 5 measure (excluding fruit and non-fruit tree planting, which was assessed separately), with 5 suggesting the household made an investment across each category on any of their parcels and 0 implying none of these land-based investments were made. The distribution of index scores shifted between baseline and endline, with the average score for LTA households increasing from 0.8 to 1.4 between baseline and endline and from 0.7 to 1.4 for the control group over the same period (Figure 23). On a per category basis, the change in parcel investments was strongest for soil conservation improvements. Around 29 percent of LTA households reported making soil conservation improvements to their land at baseline, with 25 percent reporting the same in the control group. By endline, 57 percent of LTA households and 61 percent of control group households reported making soil conservation improvements to their land, the largest change between rounds for any of the five land investment categories.

FIGURE 23: LAND INVESTMENT INDEX BY ROUND AND ASSIGNMENT



⁶⁷ Some noise is expected on self-reported parcel areas for both groups. Households in the treatment group may also report their land areas more accurately at endline, since the parcels were measured during land mapping and demarcation and the areas are reported on the CCRO. In both treatment and control group households, self-reported parcel sizes were larger at baseline for reasons that are not entirely clear. It is also possible that newly acquired parcels by endline were much smaller on average than a household's existing parcels, but the IE data do not suggest this.

USE OF FERTILIZER

Fertilizer is an important input investment that households can make to enhance agricultural productivity. At endline, around 75 percent of LTA households (n=489) reported using fertilizer on 1 or more parcels, with 72 percent of control group households (n=513) reporting the same (p=0.23). At baseline, 52 percent of control group and LTA households (n=438 and 383, respectively) reported using fertilizer. Regardless of the number of parcels a household reported, fertilizer use was above 65 percent in LTA and control village households. The overall trend in the survey data is increased use of fertilizer regardless of household head type, CCRO status, or assignment.

PREVALENCE OF TREE PLANTING

Tree crops provide a measure of parcel investment and can provide insights into landholders' tenure security, given the typical years-long timeframe for tree crops to mature and begin yielding harvestable products. Farmers with more secure land tenure are expected to be more likely to invest in tree planting (Fenske 2011), although tree planting can also be a way for customary landholders to increase their claim to land (Goldstein and Udry 2008) **Around 1 in 5 households in both LTA and control group villages reported planting non-fruit tree crops at baseline (n=153 and 162, respectively). By endline, 26 percent (n=171) of LTA households reported planting non-fruit trees, while 21 percent of control group households reported the same (n=146).**

The findings for fruit trees are similar to non-fruit trees: both LTA and control group villages reported an increase in fruit tree planting between baseline and endline. Around 46 percent (n=157) of LTA households reported planting fruit trees at baseline, with 49 percent of control group households (n=215) reporting the same. At endline, 61 percent of control group households (n=433) and 65 percent of LTA households (n=425) reported planting fruit trees. These results hold regardless of whether the household also reported fallowing. Households in areas that experienced an increase in building density had lower levels of fruit tree planting overall during LTA, but there was no statistical difference in fruit tree planting between LTA and control group villages in these areas.

Qualitative findings at endline suggested that donor-funded programs that encourage tree planting were present in Iringa District, but they did not appear to be widespread. Another potential impetus behind the increase in tree planting could have been encouragement by district extension staff, as KIs indicated that the district has encouraged farmers in recent years to plant avocado – which is viewed to have market potential due to demand from foreign markets – and timber trees such as pine, eucalyptus, and cypress. One CDO KI also noted that in her experience, villagers were motivated to plant trees by seeing non-residents from Dar es Salaam and other more urbanized contexts planting trees on plots they have in rural villages in the district.

FALLOWING

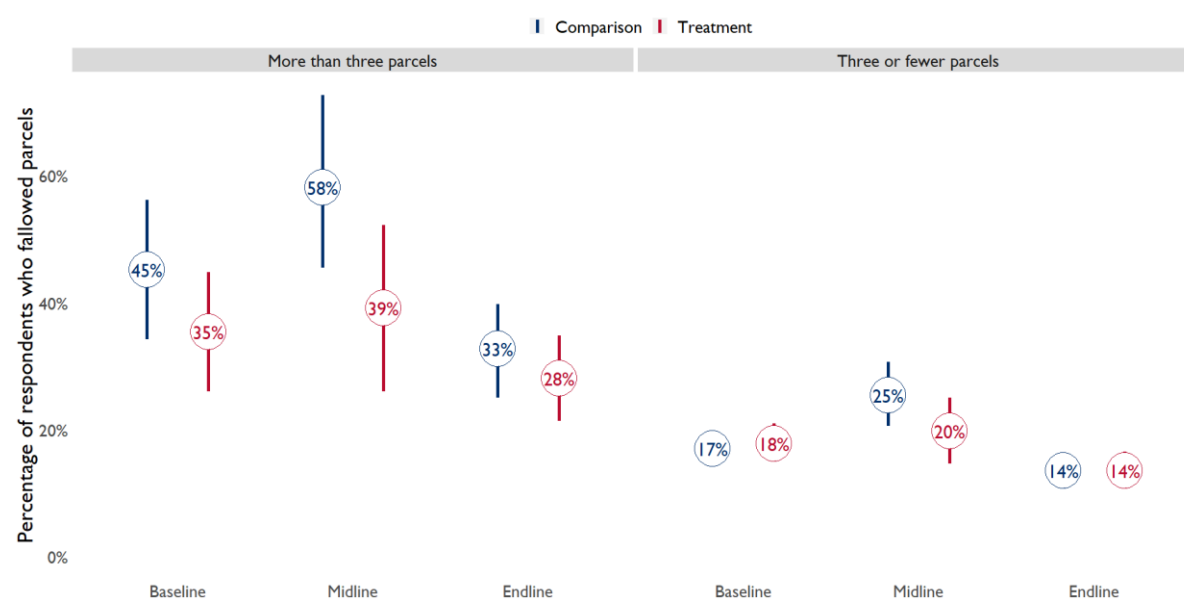
The percentage of respondents who reported fallowing any of their parcels decreased between baseline and endline across both assignment groups, but this change was not statistically significant. At baseline, about 20 percent of LTA households (n=148) and 20 percent of control group households (n=163) reported fallowing one or more of their parcels during the last agricultural season. By endline, this decreased slightly to 18 percent for both LTA households (n=114) and control group households (n=126). The prevalence of fallowing holds regardless of household assets, and for households with more than or less than four people, the average household size for both assignment groups.

A higher percentage of households with more than three parcels reported fallowing one or more of those parcels across both assignment groups (Figure 24). Fallowing for households with 3 or fewer parcels was low across each survey round, with 14 percent of LTA households (n=64) with 3 or

fewer parcels reporting following 1 of them. One of the 82 LTA households with 1 parcel reported following their parcel in the previous year.

The declining trend in following could reflect growing land pressure in Iringa District. The IE team's qualitative data collection at endline suggested that the fairly low rate of following could also relate to households' perceived vulnerabilities about losing land that appears to be in an unused state. As discussed for EQ1, the reasons for this concern vary, and include longstanding norms regarding the potential for the village or the state to reallocate undeveloped land for alternative uses, misinformation, and rumors or people's direct experiences regarding land grabbing by investors. KIIs also indicated that village councils have in some instances been the source of expropriation for unused parcels held by individuals villagers, although this does not appear to be widespread.

FIGURE 24: FOLLOWING BY PARCEL NUMBER, ROUND, AND ASSIGNMENT



CROP DIVERSIFICATION

Households were asked to identify all crops grown on their parcels during each survey round, which enabled the IE team to construct measures of change in both the number and types of crops grown. The IE was designed to focus on permanent crops, which refers to perennial tree, bush, or vine crops that produce harvests for many seasons and do not need frequent replanting. The IE tracked diversification into such crops as one indicator of crop diversification and household expansion into commercial agriculture.⁶⁸ In theory, households with stronger land rights and improved tenure security via a CCRO are more likely to invest in perennial crops that typically require upfront household investment and years to establish and mature before farmers will obtain economic returns. At baseline, LTA households reported growing around 1.6 permanent crops on average, while control group households reported 1.5 permanent crops ($p=0.2$). **At endline, the number of permanent crops increased across both assignment groups: LTA households reported growing 2.6 different permanent crops and control group households reported growing 2.4 different permanent crops ($p=0.03$).**⁶⁹ This trend persisted for households that received extension services, with LTA households that said they received extension services reporting 2.9 permanent crops at endline and control group households that received

⁶⁸ The main cash crops in Iringa District include maize, wheat, rice, tomatoes, soybeans, beans and Irish potatoes (all annual crops) as well as, more recently, avocado and cashew nuts (which are perennial tree crops).

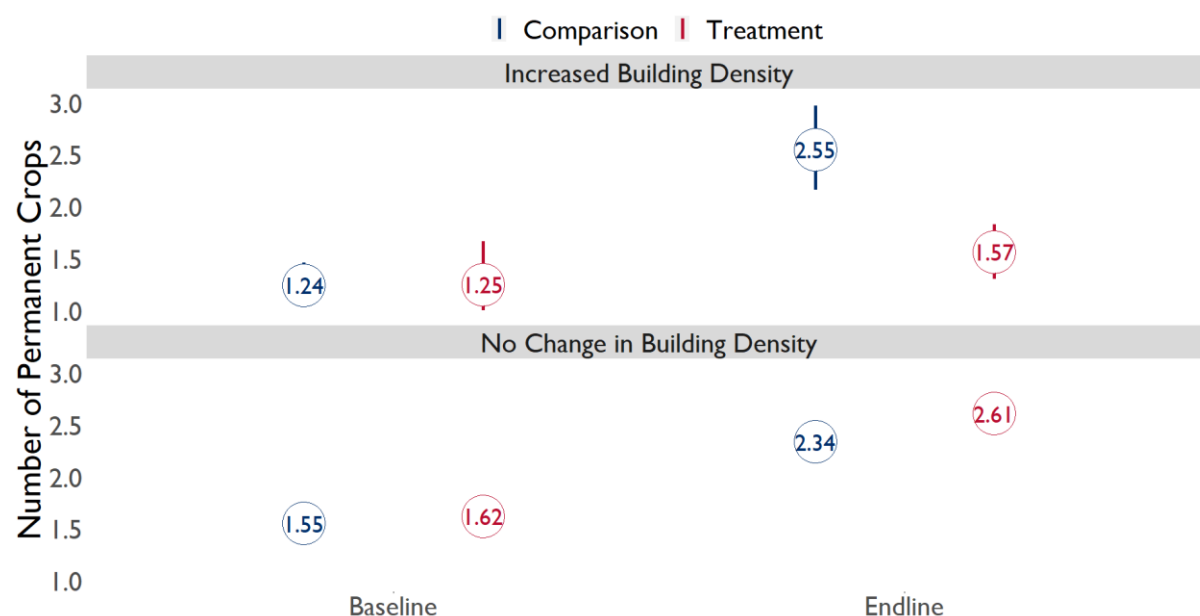
⁶⁹ The household survey design and absence of a plot roster did not allow the IE team to look at whether the total area of land planted under particular permanent crops may have expanded or changed. Instead, the team looked at diversification into different crop types.

extension services reporting 2.6 permanent crops ($p=0.32$). The proportion of households that grew any permanent crops increased across both assignment groups between baseline and endline. Forty-six percent of both LTA and control group households ($n=336$ and $n=381$) reported that they grew permanent crops at baseline on any of their parcels, which increased to 65 percent of LTA households ($n=424$) and 61 percent of control group households ($n=433$) at endline.

There is some variation in crop diversification depending on the household's urbanization context, which is based on satellite data of new buildings in a 100-meter radius of each household in the sample within the past 4 years. Built-settlement growth provides a measure of increasing density and building construction, and indicates areas that are experiencing peri-urbanizing growth in the LTA context. The IE team considered the possibility that settlement areas that are rapidly growing may experience increased land pressures and/or market contexts that alter a farmer's decision to invest in permanent crops. Control group households in areas with increased building density (as measured by building extent above the 90th percentile) reported growing *more* varieties of permanent crops at endline, while a similar trend was not observed for LTA households in similarly peri-urbanizing areas (Figure 25).

The household survey did not ask respondents about market access or reasons for crop diversification decisions. One interpretation for the disparities in Figure 25 could be that, in the absence of a CCRO to protect the landholder's customary rights to the land, farmers' establishment of permanent crops on land in areas that are experiencing greater land pressure and building extent strengthens their claim to the land.⁷⁰ It is also possible that, relative to treatment areas in similar peri-urbanizing contexts, control group households in areas experiencing increased population density and building growth happen to be in areas with better market access, agricultural extension services, or exposure to demand for such crops, any of which could also help motivate farmers to switch to such crops.

FIGURE 25: NUMBER OF CROPS BY ASSIGNMENT AND BUILDING DENSITY

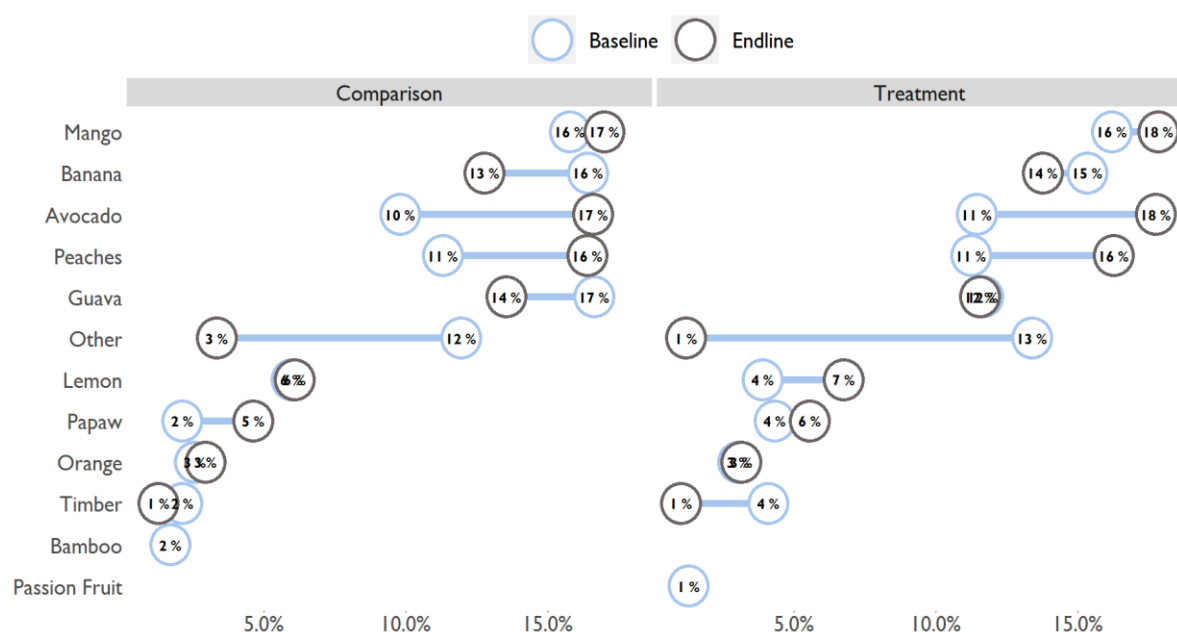


Mangos, avocados, and peaches were the most frequently reported permanent crops at endline (Figure 26). In addition, LTA households reported an increase in planting lemons on at least one parcel between baseline and endline. In areas experiencing increased building, control group

⁷⁰ This might align with the classic notion of farmers using tree planting, perennial crop establishment and/or visible land improvements as ways to strengthen their claims to land and improve their tenure security, particularly in customary contexts (see Besley, Goldstein and Udry 2008; Fenske 2011).

households reported planting limes, oranges, papaws, pears, pomegranates, and coffee, none of which were reported for control group households in rapidly urbanizing areas at baseline. While both LTA and control group households reported increasing mango planting, LTA households in areas experiencing increased building reported a higher rate of mango planting at endline relative to control group households in areas experiencing similar increases in built extent. For LTA households in areas experiencing increased building, mango planting went from 27 percent of self-reported permanent crops (n=3) to 36 percent (n=13), compared to 33 percent (n=12) to 28 percent (n=22) for control group households in similar areas.

FIGURE 26: CHANGE IN PERMANENT CROP MAKE-UP BY ROUND AND ASSIGNMENT



Qualitative interviews pointed to a number of key constraints that hindered smallholder diversification into these and other cash crops in Iringa District. Some KII respondents pointed to farmers' long history in rural Iringa District of small-scale subsistence farming and noted there is a mindset barrier to overcome in helping farmers transition to larger-scale farming for business or commercial purposes. Farmers were primarily used to growing maize and accustomed to growing a single crop per season.

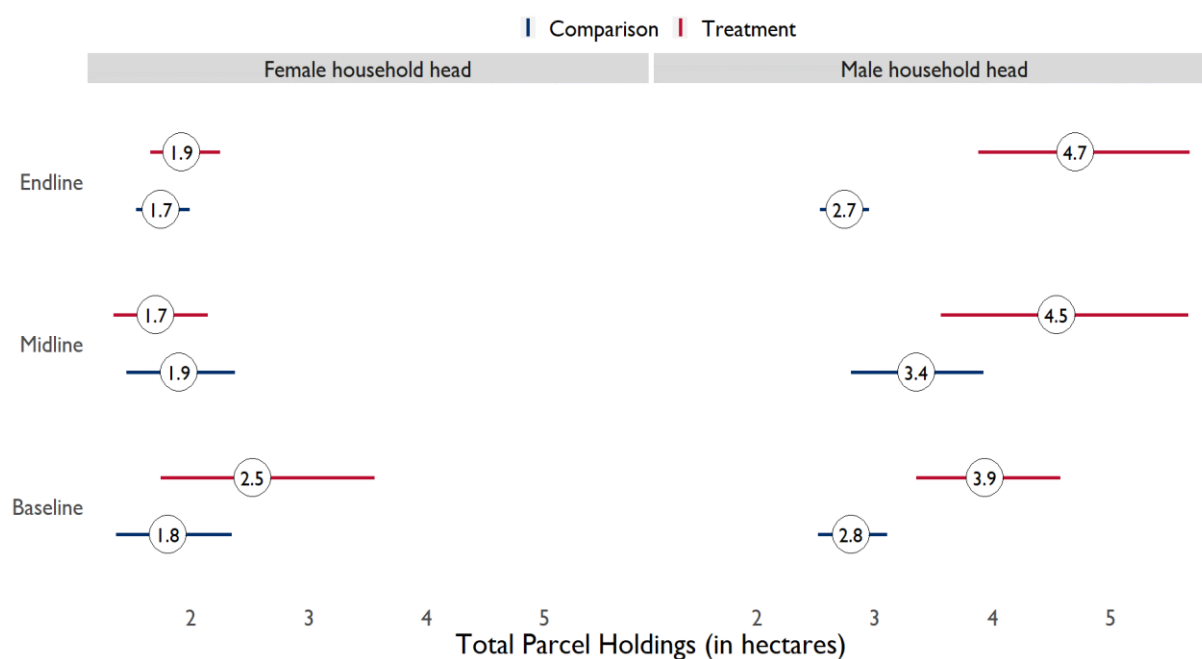
CCROs were seen by ward- and district-level key informants to have provided farmers with long-term certainty on their land ownership rights and their ability to use the land as they would like into the future, but they highlighted that even with this improved tenure security, rural farmers still face several challenges to transition from subsistence maize farming into more commercially oriented agriculture and to realize agricultural-based economic growth. These included substantial barriers that farmers still face in switching to more market-oriented crops, including high input costs, insufficient technical knowledge on the appropriate farming practices for a given crop, lack of capital to buy required equipment, limited markets, and high transport costs. While some wholesale buyers do buy directly in villages, ward-level KIIs also noted that farm-gate prices are typically low.

"You will find that someone uses a lot of cost in planting [a new crop] but after harvesting since the market is limited, they end up getting losses." – KII with a community development officer

TOTAL LANDHOLDINGS

Total landholdings increased between baseline and endline for LTA households, from an average of 3.6 hectares to 3.9 hectares. In contrast, control group households reported a slight decrease in average total land holdings, from 2.5 hectares to 2.4 hectares. There was some variation within the change in holdings based on the household head's gender. Female household heads in both assignment groups saw decreases in their total land holdings, while male household heads in the control group saw no significant change in total land holdings between baseline and endline (Figure 27).

FIGURE 27: AVERAGE TOTAL LANDHOLDINGS BY GENDER AND ASSIGNMENT



While total landholdings increased on average for LTA households, parcel size decreased for both assignment groups. At baseline, the average parcel size was around 1.6 hectares for LTA and 1.2 hectares for control group households. This decreased to an average parcel size of 1.3 hectares for LTA households and 0.8 hectares for control group households.

The relatively small parcel sizes that households farm in Iringa District was raised in the endline KIs as a barrier to households' longer-term economic growth and agricultural productivity. As one ward-level CDO pointed out, the typically small farm sizes that households control do not allow farmers to take advantage of efficiencies of scale for agricultural production. Even for households that have larger farms, their lack of capital and inability to further expand their farm sizes, together with farmers' inability to afford the necessary labor and other inputs required to profitably farm larger areas, are also key constraints.

USE OF COMMUNAL LAND

A key part of LTA was the facilitation of VLUPs in communities prior to starting to map and demarcate landholders' individual parcels for CCRO issuance. As part of the VLUP process, communities came to agreement on areas they would designate for different communal land uses and those areas were demarcated. In theory, the VLUP process was anticipated to clarify communal land use areas, improve the use of communal spaces in villages, and reduce disputes around use rights and other issues that arise from ambiguously defined land use in villages.

The IE found that household self-reported use both assignment groups but the increase was larger of communal land in villages increased across for LTA villages than control group villages. At

baseline, 29 percent (n=213) of LTA households reported using communal pastureland, which increased to 75 percent (n=238) at endline. Control group household use of communal pastureland did not change over the same period. This increase persisted for LTA households regardless of assets, land investment, the number of parcels the household controlled, and building density. However, the increase was most pronounced for households that made investments in their land, with 46 percent (n=137) of LTA households with land investment index scores above the average of 0.8 reporting that they used communal pastureland (Figure 28).⁷¹

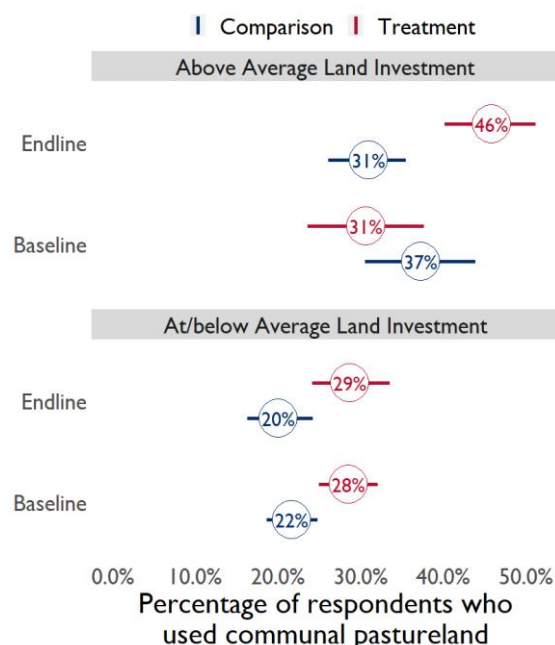
Households that reported using communal land were also asked about their perceptions of tenure security related to this land. At baseline, 13 percent of control group households (n=106) who used communal land felt they could lose their access rights in the next 12 months, while 8 percent of LTA households (n=58) felt the same about their future communal access rights.

At endline, 17 percent of control group households (n=118) and 9 percent of LTA households (n=62) expressed concerns about future communal land access. Around 3 percent of LTA households felt losing communal land access was “somewhat” or “highly” likely, while around 4 percent (n=26) of control group households felt the same. Households most frequently cited farmers encroaching on communal land as the reason they were worried about their future communal land access, with 17 percent of control group households expressing this concern (n=14) and 18 percent of LTA households (n=12) mentioning it. Other reasons cited included village leaders decided to reallocate the communal land (10 percent in control group households and 14 percent in LTA households) and government allocation of land (6 percent in control group households and 5 percent among LTA households). These findings align with the broader tenure security findings reported above, with the level of concern about future land rights lower among LTA households, but also suggests that the reasons for concerns where they do exist are similar across assignment groups, which speaks to the Iringa context at large.

IMPACT ANALYSIS RESULTS

As noted in the descriptive analysis above, many of the land investment outcomes similarly improved or changed across both assignment groups during LTA. Holding household characteristics constant, the inferential analysis found no evidence for LTA having an impact on any land use or land investment outcomes assessed for this EQ except for fruit tree planting, use of communal pastureland, and permanent crop count (Figures 29 and 30). However, the estimates for fruit tree planting and permanent crop count are largely driven by the village fixed effects and are not robust to sensitivity tests. As noted in the descriptive analysis, use of communal pasture land was higher in LTA villages, and the inferential analysis suggested that LTA almost doubled the odds that a

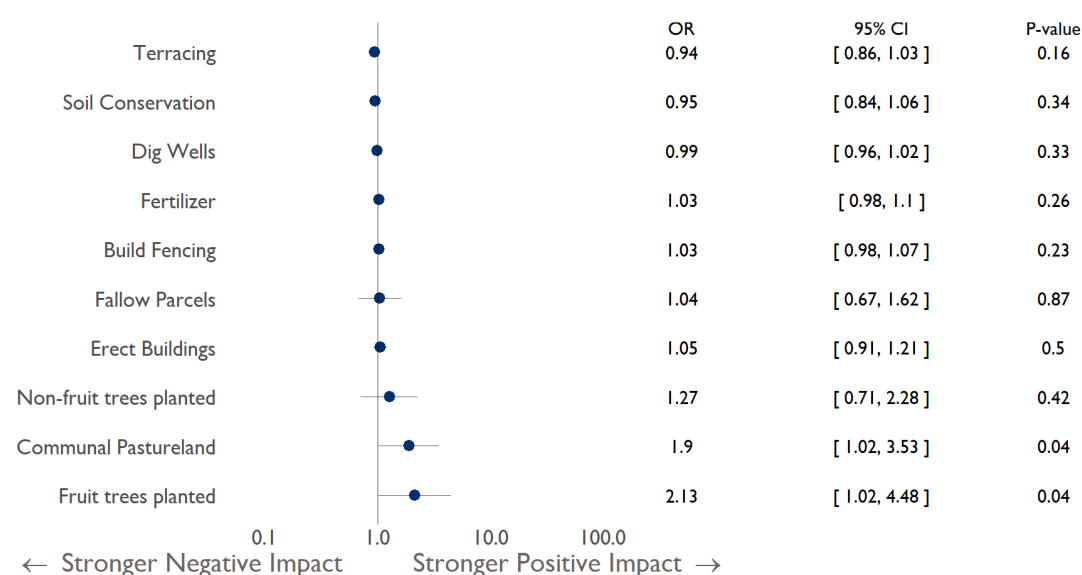
FIGURE 28: COMMUNAL PASTURELAND USE AT BASELINE AND ENDLINE BY ASSIGNMENT AND LAND INVESTMENT INDEX



⁷¹ In the absence of the planned qualitative data collection with LTA and control group households at endline, it is difficult for the IE team to point to potential explanations for this pattern.

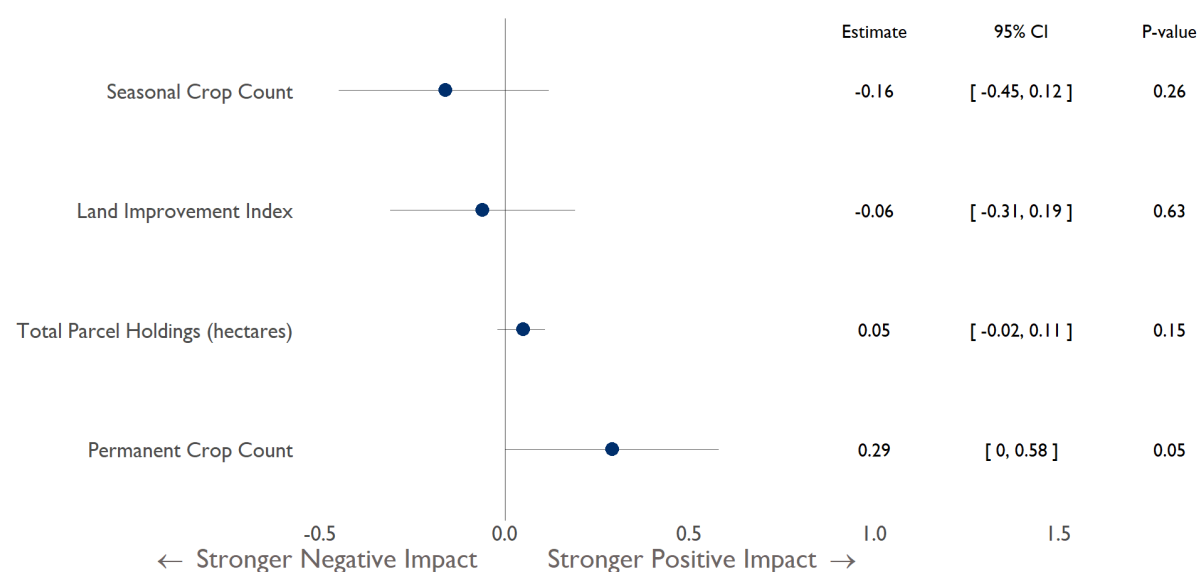
household uses communal parcel land, on average, after controlling for household characteristics. This finding held across multiple specifications and with and without fixed effects.

FIGURE 29: ESTIMATES OF LTA'S IMPACT ON BINARY INVESTMENT INDICATORS



Estimates presented with robust 95% confidence intervals and with village fixed effects

FIGURE 30: ESTIMATES OF LTA'S IMPACT ON CONTINUOUS INVESTMENT INDICATORS



Estimates presented with robust 95% confidence intervals and with village fixed effects

DISCUSSION AND CONCLUSIONS

As households experience increased tenure security and fewer land disputes via formalized customary land documentation, both in the present and expected in the future, they are anticipated to be more likely to make productivity or value-enhancing investments in their land. This could occur across different types of investments, particularly those that may require greater financial capital, labor, or longer time horizons for the landholder to reap the benefits of the investment. The theoretical expectations for an investment effect from land tenure strengthening have been fairly well supported by recent rigorous empirical studies. Positive findings on investment impacts comprise perhaps the strongest evidence base to date across any of the key types of longer-term

impacts that are hypothesized to result from land tenure strengthening interventions, even if that evidence base itself still rests on a small number of studies.⁷²

EQ3 examined this in the LTA context by looking at the extent to which LTA households made new or additional types of productivity-enhancing land investments across several indicators. Contrary to a positive trend within the current evidence base, results from this IE showed a similar increase over time on several of the investment indicators across both LTA and control group households and there was no evidence of an investment effect due to LTA's CCRO provisioning. While the IE's initial findings for EQ1 and EQ2 on tenure security and land disputes suggest that the early steps on the envisioned causal pathway for rural smallholders to achieve improved economic wellbeing through customary land formalization are underway, the investment findings for EQ3 provide little evidence that households' improved tenure security and possession of formalized land documentation has spurred them to make new or different investments in their land – or at least not at sufficient magnitude to be detectable through this IE, which is not powered to detect small-scale impacts that are considered unlikely to be of interest from a policy perspective.

However, the descriptive trends at this stage suggest that some small positive movements toward greater land investments have taken place for farmers in general throughout Iringa District, even though those changes cannot be attributed to LTA's CCRO provisioning. The supporting endline qualitative data highlighted that while CCRO provisioning is clearly viewed as essential to laying the foundation for farmers' land investments, broader farming and market constraints will also likely need to be addressed before landholders in the LTA context can do so effectively. Still, it may be encouraging that the investment outcomes point to positive movement in terms of productivity-enhancing investments like soil conservation, use of fertilizer, expansion into more permanent crops, and crop diversification.

Household decision making regarding productivity- or value-enhancing investments has long been tied to their tenure security outlook under theoretical framings for how strengthening property rights may lead to improved land productivity and economic wellbeing. As part of household decision making around parcel use, inputs, and related investments, households take into account the expected time to realize the benefits from these decisions and the likelihood they will retain the ability to continue using the land as they wish into the future. In some contexts, it has therefore been hypothesized that customary land formalization will induce a greater likelihood for households to shift their crop choices to longer-maturing or perennial crops, which require longer timeframes to establish, mature, and reach peak productivity.⁷³ However, other facilitating conditions are also likely to play an important role. For example, households presumably must also have access to other required input resources, specific farming knowledge, and perhaps financial capital to undertake many of the types of land investments that the sector expects to see expansion on.

With respect to rural farmers' diversification into permanent crops, a particular objective in the SAGCOT region, the IE results indicate small increases of similar magnitude in the proportion of LTA and control group households that farmed some permanent crops, particularly avocado and peaches. Overall, however, the proportion of households that engage in such farming remained fairly small at endline, and preliminary results do not provide strong evidence for an increase on this due to CCRO provisioning at this early stage after farmers' receipt of the formalized land document. Moreover, the qualitative findings pointed to market constraints and other barriers that farmers would need to overcome to effectively expand beyond their current strong focus on subsistence agriculture for their own households needs.

⁷² For example, Higgins et. al.'s recent systematic review of the effects of increased land tenure security found support for a positive effect on land investments across 8 of the 10 rigorous studies they examined, although not all studies in the sample had uniformly positive results on this (Higgins et. al. 2018.)

⁷³ Goldstein et. al. 2018.

This IE result on permanent crop diversification in the LTA context is in contrast to previous studies of customary land formalization in sub-Saharan Africa, which have documented a shift from subsistence crops to greater investments in perennial cash crops. In Benin, mapping and demarcation of customary land⁷⁴ led to a 23-43 percent increase in the likelihood that households grew perennial cash crops and planted trees, both key land investments. At the parcel level, parcels that had been mapped and demarcated were 2.4 percentage points more likely to be used for perennial crops, and 1.7 percentage points more likely to have had a tree recently planted on it.⁷⁵

Impact studies of customary land formalization in Rwanda and Ethiopia also pointed to positive impacts on soil conservation investments, in contrast to the LTA IE findings. In Rwanda, regularized land rights led to a 10 percentage point increase in the likelihood of soil conservation measures for households, or about double the change observed for the control group. Impacts were even greater for female-headed households, with a 19 percentage point increase.⁷⁶ In Ethiopia, household likelihood to invest in soil conservation measures increased by 20 percentage points.⁷⁷ A 2018 systematic review of land tenure strengthening programs also found evidence for positive effects on soil conservation investments across several of the studies examined.⁷⁸ In the LTA context, it may be that other constraints beyond farmers' perceived level of tenure security currently serve as more immediate barriers to undertaking such land-based investments.

In many land contexts, theories of change on customary land formalization also anticipate an increase in the likelihood that a household will leave land fallow once they obtain formalized documentation of their land rights. The IE results on fallowing incidence indicate that fallowing is not common in Iringa rural district; only a small proportion of households reported leaving at least one of their parcels fallow during the last agricultural season. These results on fallowing incidence also align with household responses for EQ1 on perceived risk of losing land that is left fallow, for which more than half of households across both assignment groups expressed concern.

Overall, the responses related to fallowing appear to indicate a fairly high level of concern, while the endline qualitative results pointed to clear reasons why households may still feel some vulnerability over leaving land fallow in the Iringa context. The EQ3 findings on fallowing incidence showed that fallowing was more common for households that controlled a greater number of parcels (three or more), but there was a declining trend on this between baseline and endline for both assignment group households. Households with three or fewer parcels were less likely to have left any parcels fallow and saw much less change on this over time. Similar to these results, Goldstein et. al.'s recent study from Benin also did not find an average effect of land mapping and demarcation on fallowing in Benin, although they did find that customary land mapping and demarcation increased the likelihood of fallowing on plots controlled by female-headed households.⁷⁹

Lastly, while this IE was not designed to measure agricultural productivity, other impact studies of customary land formalization in sub-Saharan Africa have found mixed effects on this. Goldstein et. al. (2018) did not find an effect on productivity or agricultural inputs in Benin, while Higgins' et. al.'s (2018) synthesis across several rigorous studies also did not find evidence for an effect of increased land tenure security on agricultural productivity. Previous studies have pointed out that the timing of data collection must be considered in results interpretation. In many contexts, particularly when the

⁷⁴In that study, household receipt of legal land certificates was still pending at the time of data collection.

⁷⁵ Goldstein et. al. 2018. Despite the shift towards perennial crops (cashew or oil palm, in their case), they did not find an effect of agricultural outputs, yields, or input use, noting that the maturation period for longer-term crops exceed the period of observation by several years. They also found no effect on the likelihood of fallowing.

⁷⁶ Ali et. al. 2014.

⁷⁷ Deininger et. al. 2011.

⁷⁸ Higgins et. al. 2018.

⁷⁹ In Goldstein et. al.'s (2018) Benin study, female-headed households' increased likelihood of fallowing co-occurred with a shift in investments and labor to land they used outside of the village boundary, which the authors interpreted as a way for women to strengthen their claims to their more peripheral land.

investment involves perennial crops, productivity gains are unlikely to be captured if endline data collection takes place before such crops mature and reach peak production.

As has been the case for many land formalization studies, this IE's results on land investments highlight a need for additional data collection more than one or two years after receipt of formalized land documentation, to better understand the longer-term effects. Echoing a point made by many other studies, it is possible that endline data collection for this IE took place before farmers' stronger tenure security effectively induced changes to their land investment behavior, and certainly before any productivity benefits from such investments could take hold.

EQ4: TO WHAT EXTENT DO THE LTA OUTREACH AND COMMUNICATION ACTIVITIES, AS WELL AS MAPPING, VERIFICATION, AND THE FORMAL REGISTRATION OF LAND, LEAD TO A GREATER SENSE OF EMPOWERMENT ON THE PART OF WOMEN, YOUTH, AND PASTORALISTS?

Key Findings for EQ4

- **Women's possession of a CCRO:** Women in LTA villages were much more likely to possess a CCRO than women in the control group, and this held both for female household heads as well as female primary spouses. At endline, 83 percent of female primary spouses in the LTA group (n=353) reported possession of a CCRO, compared to only 13 percent of female primary spouses in the control group (n=57). Results on CCRO possession by female household heads were similar, with 88 percent of female household heads in the LTA group (n=165) reporting having a CCRO compared with 10 percent of female-headed households in the control group (n=23).
- **Women's perceived tenure security:** The IE results suggest a decline in female primary spouses' perceived tenure *insecurity* during LTA, which was observed across spouses in both LTA and control group households. The results suggest a somewhat greater reduction in tenure insecurity among female primary spouses in LTA households relative to those in the control group, but the smaller sample size of the wives survey prevents robust inferential analysis and the findings cannot be directly attributed to LTA's CCRO's provisioning. Perceived tenure insecurity also declined for female-headed households (see EQ1).
- **Wives' involvement in decision making on use of household land parcels and income from household land:** Results on use and income from the household's land suggest an increasing trend in male-led decision making on this during LTA. However, this was consistently reported across both LTA and control group female primary spouses and there was no evidence for LTA having an effect on this change. In the absence of endline qualitative data collection, the IE team cannot point to reasons for this trend. At endline, female primary spouses reported a similar level of joint decision making (self and spouse together) about parcel use, reported by 64 percent of LTA female primary spouses (n=275) and 63 percent of control group female primary spouses (n=285). The proportion who reported decisions primarily by the (male) spouse was also similar at endline, at close to a third of wives in both assignment groups.
- **Wives' participation and inputs into productive decisions:** Women's participation in food crop farming was high, followed by minor household expenditures, livestock raising, cash crop farming, and major household expenditures. A large proportion of female primary spouses typically feel they have at least some input into decision making across each of the four main productive activities, where they participated in them, and this changed little across survey rounds. There was no evidence for an effect on this due to LTA.
- **Wives' control over use of income related to production:** The large majority of female primary spouses were already exercising some input into decisions on use of income at baseline, and there was little substantive change on this during LTA. The overall findings on wives' decision-making inputs into use of income from agricultural activities suggest that at endline, at least 90 percent of spouses were engaged on this jointly with their spouses to at least some extent, and there was little change since baseline or as a result of LTA's CCRO provisioning.

- **Wives' comfort speaking in group settings:** The IE results suggest a fairly high level of women's comfort speaking in group settings from baseline, and a similar level of improvement on this during LTA irrespective of assignment group. At endline, 66 percent (n=284) and 67 percent (n=306) of female primary spouses said they were comfortable speaking in group settings among LTA and control group households, respectively. There was no evidence for an effect of LTA's CCRO provisioning activities on women's comfort speaking in group settings.

The concept of empowerment is typically framed around the interconnected dimensions of resources, agency, and achievements.⁸⁰ The scholarly literature has pointed to multiple challenges associated with measuring women's empowerment, including challenges in trying to measure empowerment through household surveys or other quantitative approaches.⁸¹ Instead, recommended best practices are to use a mixed-methods approach, with primary reliance on qualitative data collection, which is better suited for collecting information on subjective dimensions of empowerment.

The IE's approach for EQ4 was not designed for inferential impact analysis and the household survey sample and survey instrument were not constructed to enable robust analysis on women's empowerment issues. Instead, the IE aimed to collect qualitative data from male and female respondents in LTA and control group villages at endline, complemented by descriptive quantitative data from the wives survey. The smaller sample size for female primary spouses and lower frequency of their participation in several activities discussed in the wives survey also made inferential analysis infeasible. While the IE was designed to address empowerment questions for EQ4 through endline qualitative data collection with male and female villagers from both assignment groups (including specifically youth and pastoralists), this was not possible due to COVID-19. As an alternative, the endline analysis focused on women's empowerment and drew on select indicators from the survey module administered to female primary spouses in the household survey sample, complemented by qualitative data collection with ward-level community development officers and DLO staff.

Some of the LTA wives survey is consistent with indicators developed for USAID's Women's Empowerment in Agriculture Index (WEAI).⁸² In selecting indicators for EQ4, the IE team aimed to examine measures that provided insights on changes to women's access to and involvement in decisions related each key resource domain the WEAI highlighted: production, resources, income, and leadership. Following the WEAI, the IE team also examined wives' participation in and involvement in decision making around eight activity areas: food crop farming, cash crop farming, livestock raising, fish farming, non-farm economic activities, wage and salary employment, major household expenditures, and minor household expenditures.

The IE team used the following indicators to examine how women's empowerment may have changed from baseline to endline and as a result of LTA's CCRO provisioning and other activities in villages:⁸³

⁸⁰ Resources consist of preconditions such as human, financial, social, and physical capital, while agency refers to elements such as women's voice, participation, and decision making. Achievements are the outcomes that women obtain as a result of their empowerment, such as income generation and assets, improved health and nutrition, and increased education (Kabeer 1999).

⁸¹ For example, see Martinez-Restrepo and Ramos-Jaimes 2017; Donald et al. 2017; Diaz-Martin et al. 2018; Chang et al. 2020.

⁸² The WEAI was developed by IFPRI and USAID/Feed the Future and is considered to be one of the most complete approaches to measuring women's empowerment through quantitative survey approaches.

⁸³ The first two indicators are derived from responses by female primary spouses and female household heads, and are also compared with responses from male household heads. The remaining four indicators are only obtained from female primary spouses, and were designed to provide insights across four of the five key dimensions that constitute the WEAI's focus on women's empowerment: inputs into productive decisions (production domain), access to and decisions on credit

- **Women's possession of a CCRO for any parcel (binary):** female household heads and wives' self-reported possession of a CCRO.
- **Women's perceived tenure security:** female household heads and wives' response regarding perceived likelihood that someone would try to take one of their parcels from them without their permission in the next five years.
- **Wives' involvement in decision making around the use of household land parcels (binary):** the proportion of female primary spouses who said only their (male) spouse primarily decided how to use the household's land parcels and make decisions about any income generated from those parcels.
- **Wives' participation in household decision making:** women's participation and input in productive decisions within households across four activities: food crop farming, cash crop farming, livestock raising, and fishing or fishpond activities.
- **Wives' control over use of income related to production (binary):** the proportion of wives who said they had no input or input into few decisions on the use of income generated from productive activities.
- **Wives' comfort speaking at village meetings or in group settings (binary):** the proportion of female primary spouses who said they were comfortable speaking at village meetings or in group settings.

The inability to collect village-level qualitative data at endline meant that the IE team was much more limited in its ability to speak to empowerment issues for pastoralists and youth through the available endline data. While the team was not able to reliably identify pastoralist households via the household survey data, the available data suggest that pastoralist households comprise only a small proportion of households in the sample.⁸⁴ As such, this IE was not able to speak to the extent to which LTA's CCRO provisioning and other village-based activities may have changed pastoralists' sense of empowerment.

WOMEN'S POSSESSION OF A CCRO

As reported in EQ1, LTA achieved widespread provisioning of CCROs in the villages in which it operated and achieved gender parity in CCRO issuance according to its own tracking data. At the completion of LTA's four years, around 50 percent of CCRO claimants were women. Moreover, LTA's tracking data show that gender parity was achieved not only across joint tenancy claims (land claims made jointly by a husband and wife) but also for single-occupancy claims, in which the landholder was either male or female.

This high level of gender parity in CCRO issuance is also reflected in the LTA IE data, which suggest that women in LTA villages were much more likely to possess a CCRO than women in the control group, and this held both for female household heads and female primary spouses. At endline, 83 percent of female primary spouses in the LTA group (n=353) reported possession of a CCRO, compared to only 13 percent of primary spouses in the control group (n=57). Most of the 18 percent of wives from LTA households who said they did not have a CCRO were from households that were not able to obtain a CCRO.⁸⁵

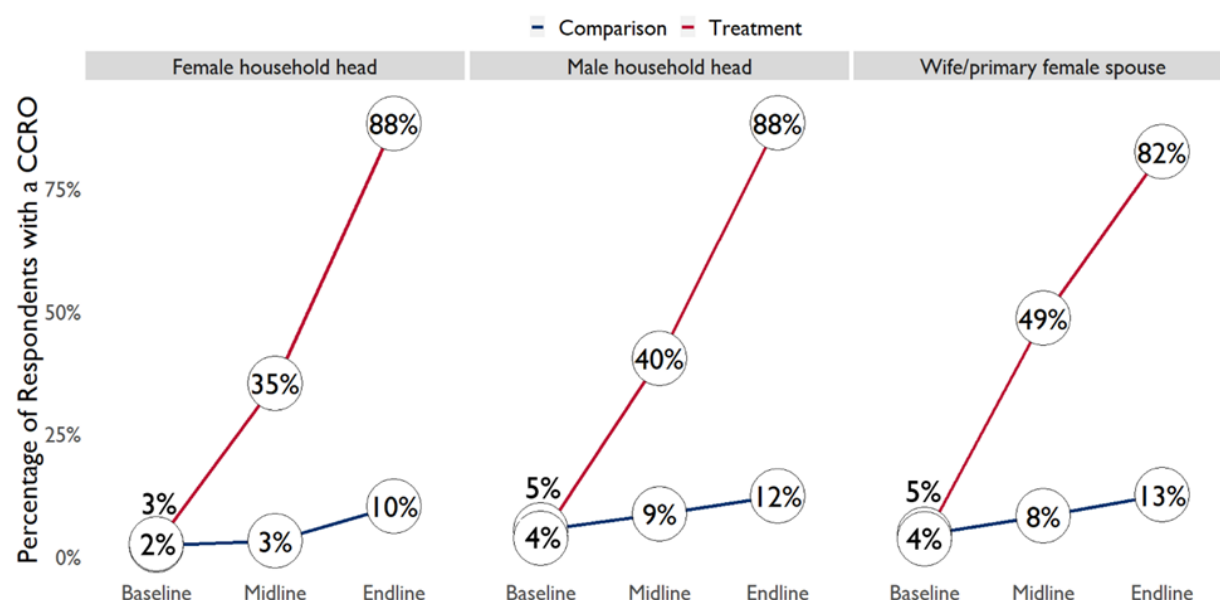
(resources domain), control over use of income (income domain), and indicators of women's leadership roles within communities.

⁸⁴ LTA did conduct awareness raising aimed specifically at pastoralists about their rights to own land, and also worked with communities through the VLUP process to set aside areas for pasture/grazing and help reduce farmer-herder conflicts. In some villages, LTA also tried to issue communal CCROs to groups of pastoralists for collective grazing areas. However, these CCROs were not issued because the process relies on engagement with the Tanzanian WMA board, which is currently defunct.

⁸⁵ In fact, the majority of such spouses were from a single village in the LTA treatment group where many households were not able to obtain a CCRO because they resided in a sub-village that fell outside of the village boundaries.

Results on CCRO possession by female household heads were similar, with 88 percent of female household heads in the LTA group (n=165) reporting having a CCRO, compared with 10 percent of female-headed households in the control group (n=23). This is in line with CCRO possession as reported by male household heads in LTA villages, where 88 percent of both head genders reported that they had a CCRO by endline (Figure 31).

FIGURE 31: CCRO COVERAGE BY ASSIGNMENT, ROUND, AND GENDER



The IE data also suggest greater gender equity among LTA households with CCROs relative to the control group, in terms of who is named on the CCRO. This was particularly so for male-headed households. A higher proportion of male heads in LTA villages reported being jointly listed with their spouse than male heads with CCROs in control group villages. At endline, 46 percent of male household heads with CCROs in the LTA group (n=190) reported being jointly listed with their (female) spouse on the document, compared to 37 percent of male household heads with a CCRO in the control group (n=22). Male household heads reported being listed as the sole single occupant for 40 percent of LTA male-headed households with a CCRO (n=165), compared to 53 percent of control group male-headed households with a CCRO (n=32).

The reporting from female household heads suggests that the majority of female household heads who received a CCRO were listed as the sole occupant, as might be expected. At endline, 68 percent of female household heads with CCROs (n=32) in the LTA sample reported being the single occupant listed on the CCRO, while 71 percent of female household heads with CCROs (n=17) from the control group reported the same. Around 20 percent of female household heads with CCROs reported being jointly listed with someone else on the document, regardless of assignment group (n=32 and n=5 for LTA female-headed households and control group female-headed households with CCROs, respectively).

The endline qualitative data provided additional support that LTA substantially helped to strengthen women's land rights and access to formalized land documentation. Several KII respondents felt that LTA helped change mindsets in villages about longstanding norms that traditionally constrained women's access to land and land rights. One CDO respondent noted that land is traditionally held by men according to customary norms and traditions among the Hehe, and female inheritance or

joint ownership of land are not always accepted.⁸⁶ KII respondents stressed the importance of LTA's sensitization work on women's land rights and its messaging about the importance of men co-owning land with their spouses. KIIs with DLO staff also highlighted LTA's achievement of gender parity in CCRO issuance as a testament to the success of its approach.

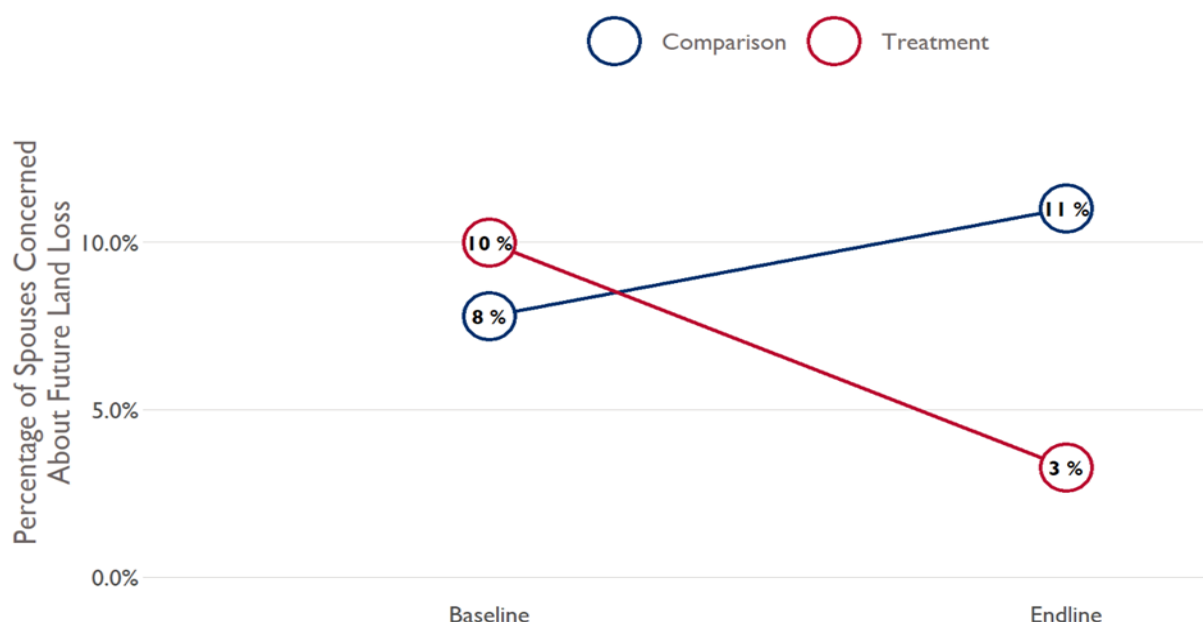
WOMEN'S PERCEIVED TENURE SECURITY

Similar to the findings reported in EQI for male and female household heads, the results on perceived tenure security for female primary spouses indicated a decline in their perceived tenure insecurity during LTA across spouses from both assignment groups. The results suggest a somewhat greater reduction in tenure insecurity among female primary spouses from LTA households relative to those in the control group, but the smaller wives survey sample size prevented robust inferential analysis and the findings cannot be directly attributed to LTA's CCRO's provisioning.

Within each surveyed household, female primary spouses were asked about their perceived tenure security for land they use via the same question on perceived expropriation risk that was administered to the household head and main survey respondent. Where respondents indicated that the likelihood of someone trying to take one of their parcels without their permission within the next five years was somewhat likely or very likely, the survey probed with a follow-up question on the main reasons why.

At baseline, 10 percent of LTA female primary spouses (n=44) thought it was possible that someone would try to take one their parcels without their permission in the next 5 years, compared with 8 percent of comparison household female primary spouses (n=38). By endline, this had dropped to 3 percent of LTA female primary spouses (n=14), but had slightly increased for control group female primary spouses to 11 percent (n=50).

FIGURE 32: SPOUSAL LAND LOSS CONCERNS AT BASELINE AND ENDLINE



⁸⁶ The Hehe are the predominant tribe in Iringa District. According to traditions, where families have both male and female children, the male children typically inherit land while the female children did not. Women also traditionally did not receive land and were not viewed as joint owners of land upon their marriage to men who held land. While some women have purchased land outright in Iringa, inheriting land from their parents was not common for women. It was common, however, for a woman to lose access to her husband's land upon his death as the husband's relatives would claim it.

Among the small proportion of female primary spouses in both assignment groups at endline who thought they could be disposed of their land in the next 5 years, 64 percent of LTA primary spouses thought this was somewhat or very likely (n=9) compared with 88 percent of control group primary spouses (n=45). This is also in contrast to the baseline, where more than 95 percent of female spouses in both assignment groups who thought land dispossession was possible said it was somewhat or very likely. However, this higher level of tenure insecurity was expressed by only a small proportion of female primary spouses surveyed.

Among this small group, the most important reasons for this concern varied by assignment group and survey round. For the small group of LTA female primary spouses that expressed concern about land dispossession, the main reason at baseline was a lack of documents confirming their rights to the land, followed by ongoing or past disputes or other problems in the community. At endline, ongoing or past disputes and other problems in the community were more commonly cited by LTA primary spouses than a lack of land documentation. The opposite trend was observed for control group primary spouses who expressed concern about land dispossession. At baseline, their main reason cited was ongoing or past disputes. At endline, the most common top reason was a lack of documentation, followed by ongoing or past disputes.

WIVES' INVOLVEMENT IN HOUSEHOLD DECISION MAKING ABOUT PARCEL USE

Greater engagement in household decision making is often viewed as a key indicator of women's empowerment. Women's role in decision making over the household's land assets is particularly of interest in the context of customary land formalization interventions, which typically must work to overcome traditional norms around men's sole control of land. The IE's wives survey contained two questions to gain insights into female primary spouses' involvement in decisions about the use of land parcels controlled by the household. These questions asked the female primary spouse to report who primarily decides how to use land parcels controlled by the household, and who decides how to use any income generated from the use of the households' land parcels. The response options were: self, spouse, self and spouse together, other male household member, other female household members, and other (specify).⁸⁷

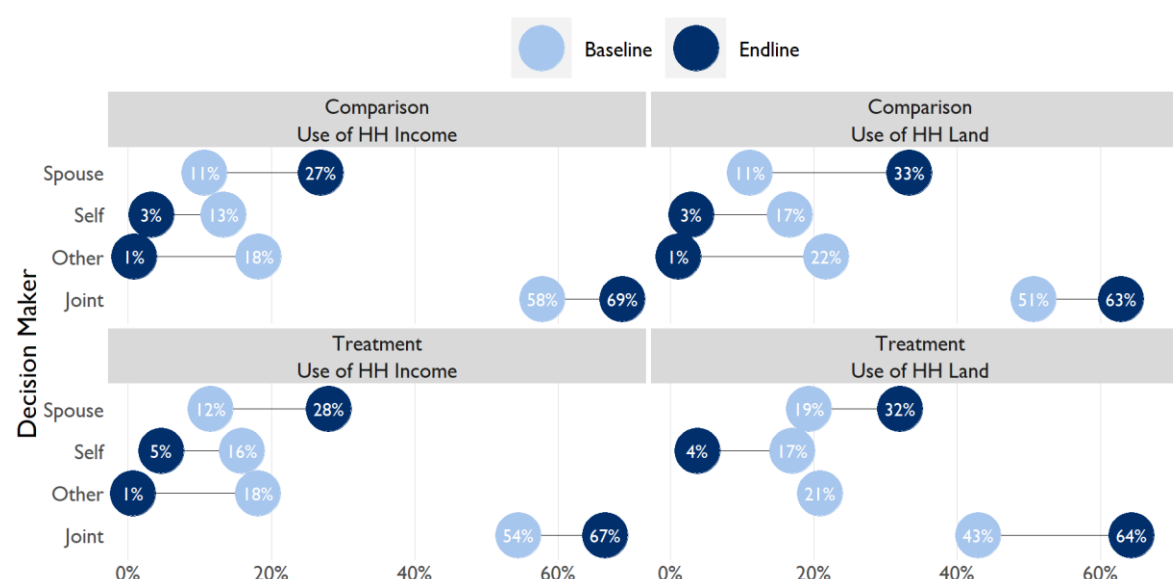
To gain insights on whether and the extent to which women's participation in land decisions changed, the IE team focused on the proportion of female primary spouses who said only their (male) spouse primarily decided how to use the household's land parcels and made decisions about any income generated from those parcels. At endline, female primary spouses reported a similar level of joint decision making (self and spouse together) about parcel use, reported by 64 percent of LTA female primary spouses (n=275) and 63 percent of control group female primary spouses (n=285). The proportion who reported decisions primarily by the (male) spouse was also similar at endline, at close to a third of wives in both assignment groups. However, in both groups this actually represented *an increase* over the proportion reported by wives at baseline (from 19 percent among LTA female primary spouses and 11 percent among control group female primary spouses).

With respect to use of income from the household's land, the IE results also show similar baseline values and a similar magnitude of change across both assignment groups. At baseline, around 11 percent and 12 percent of female primary spouses reported decision making on use and income from household's land solely by their (male) spouse for the control and treatment groups, respectively. At endline, this had increased to 28 and 27 percent, respectively, across LTA and control group female primary spouses. Overall, the findings on male spouse versus male and female joint decision making about use and income from the household's land suggest an increase in male-led decision making during LTA. However, this was consistently reported across both LTA and control group female primary spouses and there was no evidence of LTA having an effect on this change. In the absence of endline qualitative data, the IE team cannot point to reasons for this

⁸⁷ In practice, responses for these latter categories were uncommon in the survey data.

apparent increase in male-led decision making about land parcels or comment on potential reliability issues for this variable.

FIGURE 33: LAND USE AND INCOME FROM LAND DECISIONS BY ROUND



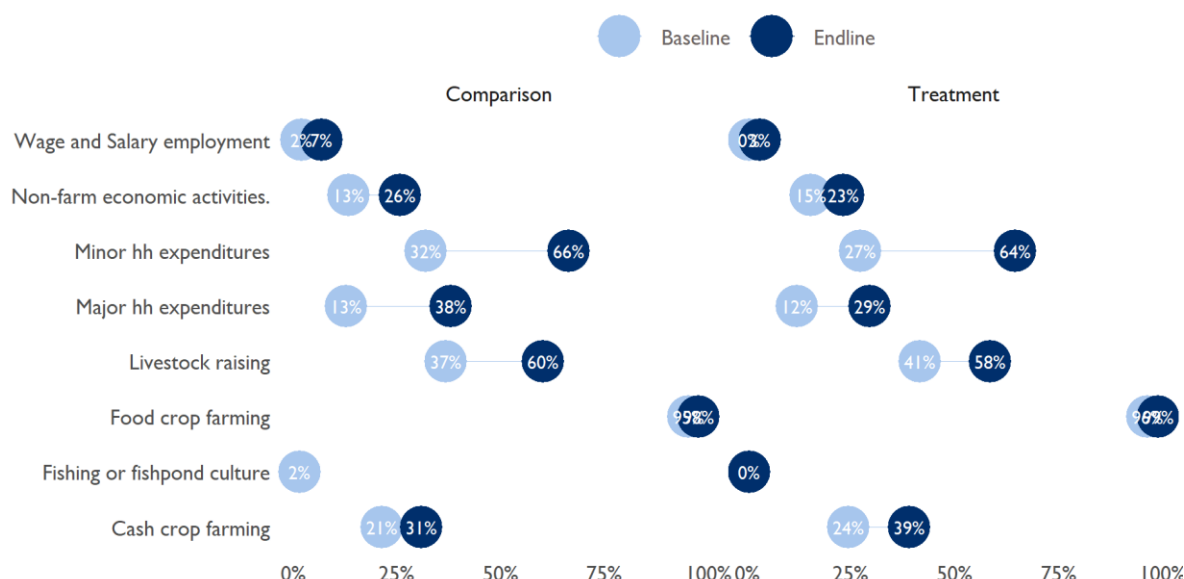
WIVES' PARTICIPATION AND INPUTS INTO PRODUCTIVE DECISIONS

The WEAI conceptualized women's overall empowerment in agriculture across four key domains: production, resources, control over income, and leadership.⁸⁸ Women's input into productive decisions in the household is the key focus for women's empowerment in agriculture within the production domain. Following the WEAI, the IE team examined female spouses' participation and input into productive decisions over the past year across four types of activities: food crop farming, cash crop farming, livestock raising, and fishing or fishpond activities. The team also assessed trends on who within the household normally makes decisions about this activity (as reported by the female primary spouse), the level of input the female respondent typically had, and the extent to which they feel they can make their own decisions about each of these activities if they wanted to.

Figure 34 shows female primary spouses reported participation across the eight activity categories the WEAI assessed. Results show that nearly all primary spouses participated in food crop farming activities in both survey rounds. Participation in wage or salaried employment and in fish farming was generally very low, and the least amount of change was observed on these activities. While women's participation in most the other activities increased for both assignment groups, the greatest movement was observed on spouses' participation in major and minor household expenses (37 and 35 percentage point increase for LTA or control group primary spouses, respectively). The magnitude of increase was generally similar across both assignment groups, but slightly greater among control group female primary spouses for participation in major household expenditures, livestock raising, and non-farm economic activities.

⁸⁸ Earlier versions of the WEAI also focused specifically on women's time allocation.

FIGURE 34: PERCENTAGE OF FEMALE PRIMARY RESPONDENTS WHO PARTICIPATED IN EACH ACTIVITY, BY ASSIGNMENT GROUP AND SURVEY ROUND



Although the positive trend on increased engagement in cash crop farming and non-farm economic activities is encouraging, qualitative KIIs with ward-level CDOs at endline also highlighted women's generally lower engagement in commercial farming and income-generating activities across Iringa District. Although LTA and other projects have established or strengthened women's groups, and CDOs generally encourage such women's groups to farm crops collectively for business and engage in other income-generating opportunities, these respondents highlighted a strong need for additional support to increase women's ability to engage in business opportunities and strengthen their access to and engagement with markets.

With respect to wives' engagement in household decision making, the IE team next examined the extent of female primary spouses' participation in decision making for the four activities that fall under the production domain: food crop farming, cash crop farming, livestock raising, and fishing or fishpond activities. According to the WEAI, a respondent is considered to have adequacy on input into productive decisions if she has some input into decisions, makes the decisions herself, or feels she could if she wanted to, for at least one of the four activities. Rather than looking simply at adequacy on inputs into productive decisions as defined by the WEAI,⁸⁹ the IE team looked instead at the proportion of female respondents who indicated their spouse normally makes decisions regarding each of the four activities and they are never or rarely informed about such decisions. In theory, a decline in this proportion should serve as an indicator of women's greater decision making participation and empowerment regarding productive decisions in the household.

Here, the IE results indicated that a large proportion of female primary spouses typically felt they had at least some input into decision making across each of these activities, where they participated in them, and this changed little across survey rounds (Table 3). At endline, approximately three percent of primary spouses in either assignment group who participated in food crop farming said their spouse normally makes the decisions about that activity and they are never or rarely informed of the decisions. For cash crop farming, approximately eight percent of primary spouses in either

⁸⁹ In practice, the IE team found that nearly all female primary spouses in the IE sample had adequacy on inputs into productive decisions, using the A-WEAI's definition.

assignment group said the same. In all, the number of wives who indicated they were rarely involved in such decisions was small, at less than 20 individuals for most of the categories assessed.⁹⁰

TABLE 3: PERCENT OF FEMALE PRIMARY SPOUSE RESPONDENTS WHO SAID THEIR SPOUSE NORMALLY MAKES DECISIONS AND THEY ARE NEVER OR RARELY INFORMED ABOUT THEM (AMONG LTA RESPONDENTS)

Activity	Baseline				Endline			
	T	(N=441)	C	(N=488)	T	(N=428)	C	(N=454)
	Percent	n	Percent	n	Percent	n	Percent	n
Food crop farming	5.4	23	3.4	16	3.1	13	2.7	12
Cash crop farming	n/a	0	n/a	0	8.9	15	7.8	11
Livestock raising	6.0	11	6.7	12	5.6	14	5.1	14
Fishing or fishpond culture	n/a	0	50.0	2	n/a	0	n/a	0

WIVES' CONTROL OVER USE OF INCOME RELATED TO PRODUCTION

The WEAI considers income as a distinct domain of women's empowerment and focuses on women's control over the use of income and expenditures within the household. The WEAI derives an indicator of women's control over use of income from women's responses on how much input she had in decisions about the use of income generated from any of the six activities noted above (excluding major and minor household expenditures), together with the extent she felt she could make personal decisions regarding aspects of wage or salary employment and major and minor household expenditures.⁹¹

To gain insights into how wives' decision-making participation over use of income changed in the LTA context, the IE team looked at how the proportion of wives who said they had no input or input in few decisions on the use of income generated from the activity,⁹² for those activities they had participated in. As for wives' general inputs into decision making related to key household livelihood activities, the IE results suggest that the large majority of female primary spouses were already exercising some input into these decisions on use of income at baseline, and there was little substantive change on this during LTA. For example, the proportion of female primary spouses who did not have input into use of income from the household's food crop farming was consistent at around 12 percent for the LTA group wives and around 8 percent for control group wives (Table 4). For use of income related to cash crop farming and livestock raising, the proportion of wives who were not involved in such decisions was a little more varied across survey rounds and assignment groups, but the overall number of women reporting a lack of income inputs on these activities was generally small (also keeping in mind women's lower overall participation in these activities). The overall findings on wives' decision-making inputs into use of income from agricultural activities suggest that at endline, around 90 percent or more of spouses were at least somewhat engaged on this jointly with their spouses and there was little change on this since baseline or as a result of LTA's CCRO provisioning activities.

⁹⁰ Respondents' participation in livestock raising was less common, but results were similar. Participation in fish farming was negligible and not further analyzed. The IE also found that for major and minor household expenditures, the number of primary spouse respondents who said they never or rarely had any input into those decisions was small, and in all cases less than 10 individuals per round assignment group or round for minor expenditures, and less than 20 individuals per assignment group and round for major expenditures. Given these low frequencies, the team did not conduct further analyses.

⁹¹ The A-WEAI considers a respondent to have adequate control over use of income if, for at least one of the activities assessed (excluding minor household expenditures, per the A-WEAI), she participates and had at least some input into decisions regarding the activity, and feels she could participate in decision making to at least a "medium extent" (per the response choices).

⁹² As opposed to having input into some or most of all decisions on the use of income generated from the activity.

TABLE 4: PERCENT OF FEMALE PRIMARY SPOUSE RESPONDENTS WHO SAID THEY HAD NO OR LITTLE INPUT INTO DECISIONS ON USE OF INCOME FROM KEY ACTIVITIES (AMONG LTA RESPONDENTS)

	Baseline				Endline			
	T	(N=441)	C	(N=488)	T	(N=428)	C	(N=454)
Activity	Percent	n	Percent	n	Percent	n	Percent	n
Food crop farming	11.9	47	8.2	36	11.5	47	7.0	29
Cash crop farming	16.0	17	6.8	7	10.9	18	9.4	13
Livestock raising	7.5	13	5.3	9	11.1	27	8.8	23

WIVES' COMFORT SPEAKING IN GROUP SETTINGS

The IE included a standard indicator on wives' comfort speaking at village meetings or in group settings to gain insights into potential changes to women's empowerment via the WEAI leadership domain.⁹³ In theory, as women become more empowered, their comfort level speaking in public and potential for leadership roles within the community is anticipated to increase. Given LTA's support to women's groups and active involvement of women's substantive participation in all stages of the land formalization process in LTA villages, the IE team examined whether such activities may have affected this aspect of women's empowerment. The IE results, however, suggest a fairly high level of women's comfort speaking in group settings at baseline, and a similar level of improvement on this during LTA irrespective of assignment group. Overall, the IE results do not provide evidence for an effect of LTA's CCRO provisioning activities on women's comfort speaking in group settings. At baseline, 59 percent of LTA female primary spouses said they were comfortable speaking in group settings (n=260) compared with 62 percent of control group female primary spouses (n=302). At endline, 66 percent (n=284) and 67 percent (n=306) of female primary spouses said the same, among LTA treatment and control group households, respectively.

DISCUSSION AND CONCLUSIONS

In rural Tanzania, as in many low-income countries, land is a crucial productive asset that supports rural livelihoods and enables individuals and households to expand their economic opportunities. Strengthening women's ownership, sustained use rights, and decision-making control over land has long been seen as key to advance women's overall empowerment and potentially their economic status.⁹⁴ The 1999 Village Land Act has been lauded for its potential to improve gender parity in land ownership in Tanzania and address entrenched discrimination against women's rights to land.⁹⁵

The IE results related to women's empowerment suggest that LTA's CCRO provisioning and other activities in villages led to some tangible and important improvements in women's empowerment. Key among these, LTA clearly led to a strong positive increase in the proportion of women with legally documented and formalized customary land rights, and this held across both female household heads and female primary spouses. Moreover, the results suggest that tenure security improved for female household heads and wives. On both issues, the magnitude of improvement was generally on par with that observed for male household heads in LTA villages.

⁹³ The WEAI leadership domain aims to capture leadership and influence potential within the community. The recent abbreviated WEAI (A-WEAI) dropped the indicator on speaking in public, however, due to sensitivity of this indicator across different contexts.

⁹⁴ To date there is a lack of evidence on how strengthening women's land rights and access to land through formalized documentation might improve their economic status, as few studies have been positioned to directly examine how stronger women's land rights and tenure security via formalized land documentation might improve credit access and other indicators of women's economic empowerment.

⁹⁵ However, as many scholars have noted, the law ultimately relies on village authorities and local governance institutions to put the law into practice and enforce it. As such, changing gender norms within these local institutions will likely also be required for stronger support to women's land ownership to materialize in practice (see, for example, Sundet, 2004).

In addition to these achievements with respect to increasing women's access to land resources, land rights strengthening, and tenure security, the IE also found indications of positive changes to women's agency in key areas, although these changes cannot be attributed to LTA. For example, the IE observed positive trends in wives' participation in several economic activities, including cash crop farming and minor and major household expenditures. Wives' inputs into decision making, control over use of income from such activities, and comfort speaking in group settings was already relatively high at baseline across both LTA and control group wives and did not appear to change substantively by endline.

Although LTA achieved gender parity on CCRO provisioning in LTA villages, and around two-thirds of wives reported joint decision making about household use of land parcels, the IE results also suggest a puzzling increase in land decisions made primarily by the male household head (as reported by their wives). While the IE was unable to provide additional interpretation for this in the absence of village-level endline qualitative data, it is important to put LTA's laudable achievements on joint titling in context for Tanzania. Although promotion of CCROs in Tanzania has long emphasized that land should be registered jointly for male and female spouses, previous research has shown wide disparities in land registration by men and women.⁹⁶ For example, a recent survey conducted across 912 men and women in 45 villages from 3 other regions of Tanzania⁹⁷ found that women owned only 4 percent of land without their husband.⁹⁸ The proportion of land that was jointly owned by husband and wife was 33 percent.⁹⁹ Overcoming entrenched traditional norms around gendered land access and use roles takes time, and in this sense attaining joint ownership may be an achievement in itself at this stage, while changes to intrahousehold decision making around jointly held land are still being negotiated within households.

Studies of customary land formalization efforts across the continent have also provided evidence of positive effects of customary land formalization on women's access to land, their land investments, and general empowerment.¹⁰⁰ Some of those results align with this IE's findings. Higgins et. al.'s 2018 systematic review found positive effects on various measures of women's empowerment across all four relevant studies in their review, including on women's household decision making. An impact study of Rwanda's land regularization program found improved access to land for legally married women and reduced gender biases in recording women's inheritance rights.¹⁰¹ In Tanzania, a qualitative study of the effects of Tanzania's land reforms found that women who experienced an increase in their own tenure security also tended experience a positive change in their participation in household decision making, although there was still evidence of traditional norms and husband's actions effectively blocking many women from improved land access.¹⁰² There is also some evidence from other studies of a link between improvements to women's land and property rights and their stronger influence over household decisions (although not for economic outcomes). A recent review of several such programs highlighted that a specific gender focus by the land formalization program is

⁹⁶ See Pederson, 2015. For example, data from two districts in northern Tanzania, Babati and Bariadi, showed that in 2010 only 3.4 percent and 5.8 percent of CCROs in the respective districts were jointly titled to both spouses (URT 2010).

⁹⁷ These were Katavi, Kigoma, and Mwanza.

⁹⁸ Incidentally, the proportion of plots in their study that had a CCRO was one to two percent, and there was no difference in this by gender of the land owner, underscoring the generally low access that rural villagers have to CCROs in Tanzania in the absence of programs to provide systematic support for CCRO provisioning.

⁹⁹ Genicot, G., and M. Hernandez-de-Benito. 2019. Women's land rights and village councils in Tanzania. EDI Working Paper Series. Consistent with LTA reporting on gender-based disparities in the amount of land owned by women, Genicot and Hernandez-de-Benito also found that women's individually owned plots were smaller on average than men's (1.5 hectares for men and 0.8 hectares for women), although the difference was not statistically significant, while the average area of jointly owned plots was 1.3 hectares.

¹⁰⁰ See: Ali et al 2014 for positive impacts of land tenure formalization on women's land ownership and empowerment in Rwanda; Cherchi et al., 2018 for positive effects of price subsidies and information availability on increasing the demand for co-titling in Uganda; and Goldstein et al. 2015, for positive effects of land formalization in Benin on women's likelihood of making soil fertility investments on their land.

¹⁰¹ Ali et. al. 2014.

¹⁰² Pederson, 2015.

often needed to engender greater women's empowerment through the intervention.¹⁰³ In that respect, LTA should be lauded for its efforts to apply a strong gender focus to all its village-level activities.

Consistent with the LTA IE findings, a 2019 study of women's land rights conducted in 45 villages across 3 regions of Tanzania also found that women most commonly own land jointly with their spouses, rather than on their own. However, and perhaps consistent with the LTA IE findings on parcel decision making, they also found that women often did not have as much decision making power about bequeathing land or selling it, or on who would be named on a CCRO (this was based on women's perception over a hypothetical situation), despite their joint ownership of the parcel.¹⁰⁴

This IE ultimately was not able to provide insights on the extent to which pastoralist or youth empowerment may have changed as a result of LTA's CCRO provisioning and other village activities due to the team's inability to collect village-level endline qualitative data. This is unfortunate, as many previous studies of land formalization efforts have pointed to the exclusion of certain marginalized or more vulnerable groups beyond women, such as youth or (particularly in Tanzania) pastoralists, through the formalization process.¹⁰⁵ Obtaining data on exclusion dynamics in the context of land registration is generally more feasible through qualitative data collection approaches rather than the quantitative survey measures that this IE relied upon.

On pastoralists rights and empowerment, some scholars have called attention to the particular vulnerabilities that pastoralists may face during customary land formalization processes in Tanzania, including ending up landless and disenfranchised of their land,¹⁰⁶ or having their traditional rangelands fragmented¹⁰⁷ through the VLUP process, due to the different nature of their land use and reliance on land relative to sedentary farmers. As a result, the VLUP can also ultimately reinforce farmer-herder conflicts rather than resolve them, or introduce other physical or economic challenges for pastoralists related to changing use or designation of village lands.¹⁰⁸

Taking a systematic, village-wide approach to land registration, as LTA adopted, can be a key way to avoid the potential for internal land grabbing by village elites. Systematic registration is another potential way to reduce existing land inequalities among more vulnerable groups who had traditionally been more disenfranchised from land access and ownership, such as women and pastoralists.

Finally, village councils may also play an important role in shaping or sustaining the land rights of women and other marginalized groups in Tanzania, post-land formalization. For example, a recent study from 45 villages across 3 regions of the country demonstrated that in many cases both male and female members of village councils do not enforce equitable standards that uphold women's equal rights to land under the 1999 Village Land Act. A key takeaway from that study was the importance of education and support to village-level land governance institutions and their members,¹⁰⁹ an issue that this IE did not examine directly and lacks insights on in the absence of

¹⁰³ See Chang et al 2020. Overall, they also found greater likelihood of success for programs that include explicit gender equality components and address key gendered-specific constraints.

¹⁰⁴ Genicot, G., and M. Hernandez-de-Benito. 2019. Women's land rights and village councils in Tanzania. EDI Working Paper Series.

¹⁰⁵ Higgins et al, 2018;

¹⁰⁶ Walwa, 2017. Bluwstein, 2017.

¹⁰⁷ Goldman & Riosmena, 2013.

¹⁰⁸ Walwa 2017.

¹⁰⁹ Pederson, R. H. 2018. Tanzania's New Wave Land Reform: A Matter of Institutionalisation. *Land Justice for Sustainable Peace in Tanzania*, 249-67.

qualitative endline data collection with villagers.¹¹⁰ Future studies should focus on these important issues through a rigorous qualitative or mixed-methods data collection.

EQ5: TO WHAT EXTENT DO THE LTA INTERVENTIONS TO STRENGTHEN LAND TENURE LEAD TO INCREASED AGRICULTURAL PRODUCTIVITY, HOUSEHOLD INCOME, AND ECONOMIC WELLBEING?

Key Findings for EQ5

- **Farm earnings (past 12 months):** Inferential analysis found no evidence for an impact of LTA's CCRO provisioning on farm earnings. Farm earnings for LTA households increased for both male- and female-headed LTA households experiencing an increase in income from annual crop sales. At endline, LTA households reported an average income from sales of annual crops of 575,799 TZS, while control group households reported an average income of 393,841 TZS, but the difference was driven by a few outlier LTA households with very high reported income. There was substantial variation in reported income from annual crops depending on the gender of the household head. At endline, male-headed households reported much higher annual crop sales income across both assignment groups. Female-headed LTA households reported an average of 101,465 TZS from sales of annual crops, compared to an average of 766,963 TZS for male-headed LTA households.
- **Credit access by household (past six months):** Inferential analysis found no evidence LTA had an impact on credit access. There was a negligible change in the proportion of households that reported borrowing among both LTA and the control group, staying fairly stable at 12 and 13 percent of households by endline, respectively. Wives' borrowing also experienced little change over time, staying at 21 percent of LTA households and 22 percent of control group households for both survey rounds.
- **Amount borrowed:** Inferential analysis found no impact of LTA on the amount of credit obtained by households. The median amount borrowed increased across both LTA and control villages to 200,000 TZS for both groups at endline.
- **Food security:** There was no evidence LTA had an impact on household food security. While it is likely too soon for LTA to have influenced households' agricultural productivity or income to a level that would affect their food security, there was an overall increase in food security across both assignment groups. However, female-headed households continued to experience more food insecurity.
- **Sources of borrowing:** Neighbors or friends were the largest source of financial borrowing across each survey round and assignment group. Borrowing from village community banks (VICOBA) increased among LTA households, from around 17 percent at baseline to 26 percent of reported borrowing at endline.
- **Use of CCROs for borrowing:** Use of CCROs in the borrowing process was uncommon by endline but occurred for a few households. Five LTA households and one control group household reported using their CCRO as part of the borrowing process. Four of the five LTA households had used the CCRO as collateral, but not for loans from commercial banks (instead from microfinance institutions, nongovernmental organizations [NGOs], and informal lenders).

As discussed for EQ3, the formalization of customary land rights is expected to lead to increased agricultural investments by landholders in ways that boost their productivity. Over the longer term, households' land investments and improvements to their agricultural productivity are anticipated to

¹¹⁰ Pederson (2018) also points out the potential for village- and district-level institutional capacity to erode over time, including on issues related to maintaining and updating land registries, recording new transactions, and (particularly at the village level) adjudicating day-to-day land matters in compliance with the law, without ongoing support from donor projects. Concerns over village and district administrative capacity and resources to implement the Village Land Act and carry out sustained land administration functions have also been raised previously (see for example Sundet, 2004).

improve their economic wellbeing. While the period for this evaluation is expected to be too short for households to have begun to achieve significant improvements to their overall wellbeing at scale, the IE team focused on the following four measures that may indicate movement toward positive change on household wellbeing over the shorter term:¹¹¹

- **Farm earnings (TZH):** the sum of respondent's self-reported farm earnings over the 12 months prior to the survey from annual crops.
- **Credit access by the household:** Whether any household member borrowed money in the six months prior to the survey, followed by a descriptive examination of the sources of credit that households access and whether this has shifted from less formal (e.g., informal money lenders, NGOs, self-help groups, friends, family) to more formal sources of credit (e.g., village community banks, microfinance institutions, commercial banks). In addition, the IE team examined ways in which the CCRO may have formally or informally been used as part of the loan process.
- **Amount of credit obtained (TZH):** the total amount borrowed over the 12 months prior to survey.
- **Prevalence of food insecurity:** an indicator of food security based on the Household Hunger Scale.

In addition to these measures, the IE team examined whether and how a household's use of formal and informal sources of credit might have changed and the extent to which there was evidence of household use of CCROs in the borrowing process – whether for collateral or other uses.

¹¹¹ The IE team chose not to measure farmer's self-reported productivity or yields directly, given concerns on reliability related to farmer self-reporting. The initial baseline survey included a module to obtain household's self-reported crop productivity on a per-crop, per-parcel basis. The module was dropped from subsequent rounds due to concerns on the reliability of responses and issues of respondent fatigue.

SUMMARY OF DESCRIPTIVE FINDINGS

FARM EARNINGS

Farm earnings for LTA households increased between baseline and endline, with both male- and female-headed LTA households experiencing an increase in income from annual crop sales. The IE survey at each round asked household heads how much they earned from the sale of annual crops. During the Phase I baseline, these questions were asked on a per-crop basis, but this approach was revised for the Phase II baseline, as well as the midline and endline surveys, to only ask about overall crop income for annual crop sales.

At endline, LTA households reported an average income from sales of annual crops of 575,799 TZS, while control group households reported an average income of 393,841 TZS. However, this higher average income at endline was largely driven by 9 LTA households in the 99th income percentile that reported income from annual crops above 6 million TZS. As shown in Figure 35, the distribution of income from annual crops over the previous 12 months was similar for LTA and control group households, with slightly more LTA households reporting income above 1 million TZS (72 households to 70 control group households) at endline.

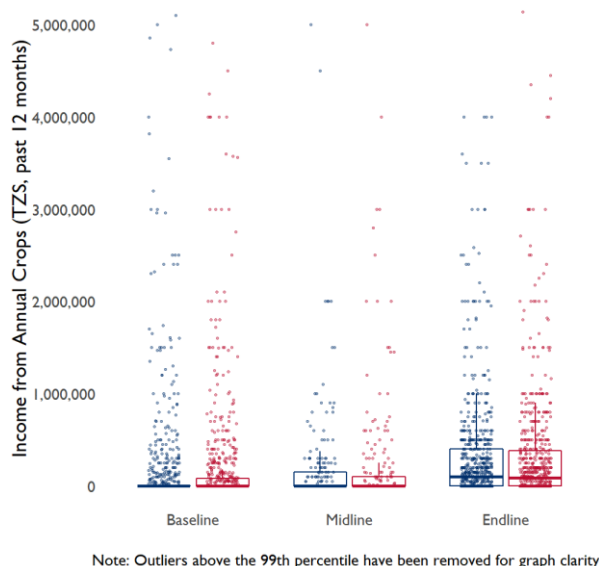
There was variation in the income reported from annual crops depending on the gender of the household head. Male-headed households reported much higher annual crop sales income across both assignment groups at endline, with female-headed LTA households reporting an average of 101,465 TZS from sales of annual crops and male-headed LTA households' reporting an average of 766,963 TZS. The average gap between male- and female-headed households in control group villages was slightly smaller due to higher reported income from annual crop sales among female household heads and lower income from male heads at 151,929 TZS to 505,340 TZS.

There was also variation across LTA and control group villages in income from annual crops depending on the rate of building density increase. The 47 LTA households at endline in areas with a high increase in building density (i.e., above the 90th percentile) reported lower income from annual crops compared to the majority of LTA households in areas that were not experiencing increased building density, 498,574 TZS to 581,808 TZS on average. Control group households in areas with greater building density reported the opposite trend: 599,611 TZS in income from annual crops compared to 363,971 TZS on average for control group households in areas with lower building density at endline. Notably, however, female-headed LTA households in areas experiencing more building had a higher income from annual crops compared to female-headed LTA households in areas with lower building extent at endline, 353,636 TZS to 85,705 TZS.

BORROWING AND CREDIT ACCESS

A key part of LTA's theory of change, which mirrors an important reason the Government of Tanzania has promoted CCROs, is that access to formal credit will be easier once households have CCROs. **There was a 1 percentage point decrease in LTA villages between baseline and endline in the proportion of households that reported borrowing in the previous 6**

FIGURE 35: INCOME FROM ANNUAL CROPS BY ROUND AND ASSIGNMENT



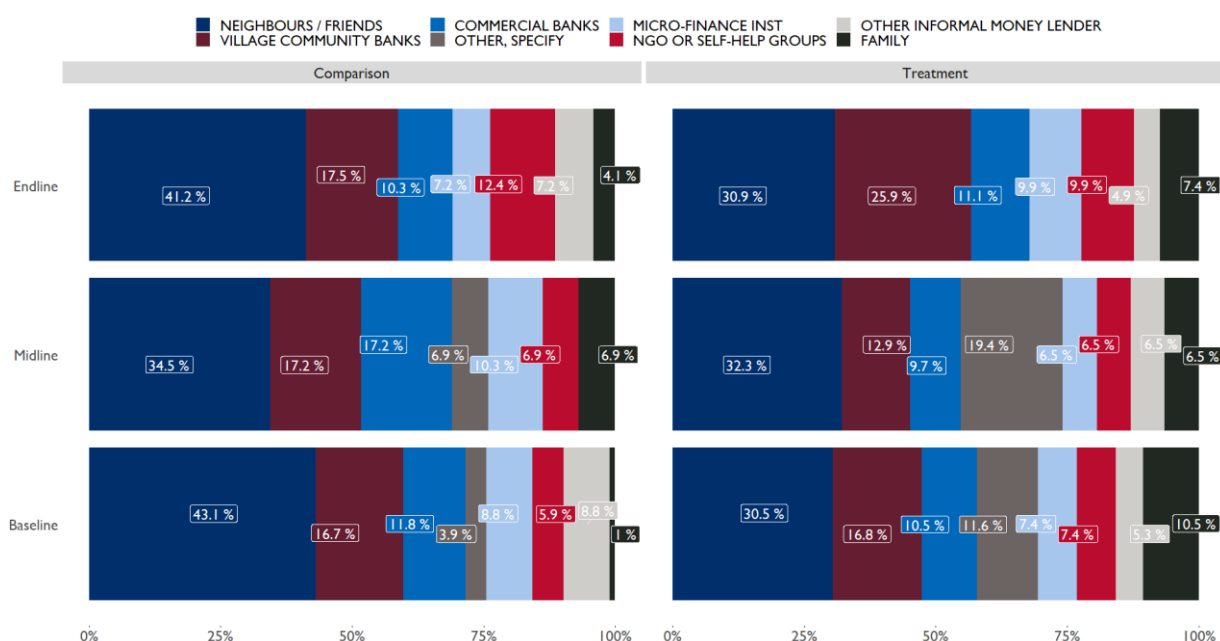
months, from 13 percent (n=95) to 12 percent (n=79). Household borrowing in control group villages was similarly stable, going from 12 percent (n=100) at baseline to 13 percent (n=90) at endline. Wives were asked separately about whether they or the household borrowed money. Their reported values differed from what household heads reported, but there was similarly no significant or meaningful change between rounds. At baseline, 19 percent of wives (n=83) in LTA villages said they had borrowed money and by endline, 21 percent of wives (n=88) said the same thing. For control group households, 23 percent of wives at baseline (n=113) and 22 percent of wives at endline (n=99) said they had borrowed money.

Neighbors and friends were the largest source of financial borrowing across each survey round and assignment group (Figure 36). Borrowing from informal VICOBAs increased in the treatment group, from 17 percent at baseline (n=16) to 26 percent at endline (n=21). Borrowing from commercial banks was the third most common credit source in both LTA and control group villages. At endline, borrowing from commercial banks comprised 11 percent of LTA borrowing households and 10 percent of control group borrowing households. Qualitative interviews at endline with district- and ward-level staff highlighted two key reasons for the generally low lending rates from formal sources of credit such as commercial banks: villagers' lack of creditworthy business activities and complicated and lengthy borrowing procedures by banks. Interviewees stressed the need for business skills development and entrepreneurship support among rural farmers in Iringa District before commercial bank lending to such farmers was likely to happen at scale.

"It is hard for them to get a loan if they do not have business that would help him/her to return back the loan." – KII with community development officer

"They do not believe in themselves and they do not know what to do with the loans they acquire. We also advise them as they start not to have the idea of taking loans but rather have the idea of engaging in a business so that they can learn about the challenges in that business." – KII with community development officer

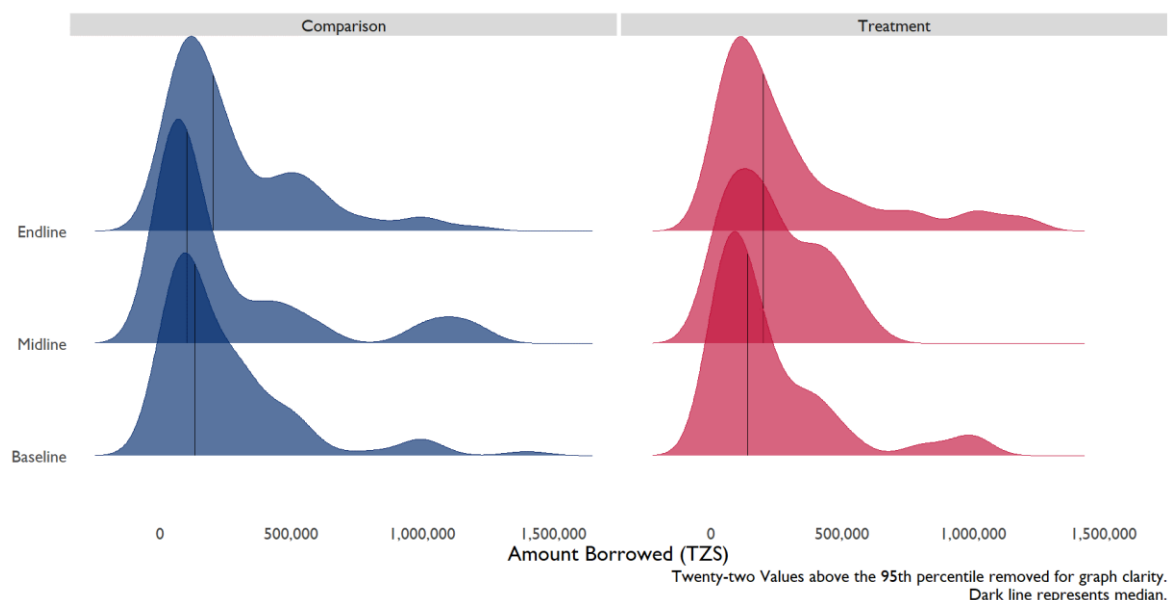
FIGURE 36: HOUSEHOLD HEAD BORROWING SOURCES BY SURVEY ROUND AND ASSIGNMENT



The median amount borrowed increased across both LTA and control group villages but was still relatively low overall. For LTA households, the median amount borrowed at baseline was 150,000 TZS, which increased to 200,000 TZS at endline. The median amount borrowed for control group

households was 190,000 TZS at baseline and 200,000 TZS at endline.¹¹² The largest amounts borrowed came from commercial banks at each round and for each assignment group. The median amount borrowed for the 9 LTA households that reported borrowing from commercial banks at endline was 800,000 TZS. Commercial banks also provided the largest amount of credit to 10 control group households, with a median 1.35 million TZS reported at endline.

FIGURE 37: AMOUNT BORROWED BY ROUND AND ASSIGNMENT



With respect to women's access to credit, the IE data show wide gender disparities in borrowing sources and in the amount of credit obtained. Among female spouses at endline, the most common source of borrowing was VICOBAs, accounting for 40 percent of wives' reported borrowing in LTA villages and 36 percent of wives' borrowing in control group villages. Borrowing from commercial banks accounted for just 5.4 percent of loans reported by wives among LTA households and 4.9 percent of loans reported by wives among control group households. On average, female household heads in LTA villages reported borrowing approximately half the amount of male household heads at endline.

Use of CCROs in the borrowing process was uncommon but there was some emerging evidence for this from a few households. Five households in LTA villages and one household in a control group village said they had to show or use their CCRO as part of the borrowing process. Of these five LTA households, four said they used their CCRO as collateral (the one control group household did not use its CCRO as collateral). None of these households used the CCRO for a loan from a formal commercial bank, however. Instead, they reported using their CCRO as some form of guarantee for borrowing from a microfinance institution (two of the five LTA households), from neighbors/friends, from an NGO, or from another type of informal lender (one each for the other three LTA households that used a CCRO for collateral).¹¹³

¹¹² There were seven outlier responses identified in the control group at baseline. When these were removed, as in Figure 36, median borrowing for control group households at baseline was 130,000 TZS and 140,000 TZS for LTA households.

¹¹³ The use of formalized customary land documentation in informal lending contexts, rather than as collateral for loans from commercial banks, is an emerging area of study. Hypothesized roles that the document could play in facilitating a loan, even if the borrower is not using their land as collateral to guarantee the loan, include helping a formal or informal lender gauge loan risk or appropriateness of the loan amount for agricultural-based activities and the individual's capacity for repayment, by providing confirmation of the applicant's landholdings. The document could also serve as a form of guarantee or indication of an individual's creditworthiness in group lending settings, whether through informal groups or more formal financial institutions.

The IE findings show that at endline, around 20-30 months¹¹⁴ after households received CCROs, used of the CCRO in the borrowing context was still uncommon. However, endline interviews with DLO, MOL, and CDO staff illuminated many of the challenges rural villagers face in seeking loans as well as using the CCRO in that process. Interviewees agreed that the CCRO helped open up credit opportunities for villages in that it clarified the legal owner of the land and provided the farmer with long-term certainty on their land ownership rights and ability to use the land in the future. However, they pointed to several other necessary types of support and challenges for rural smallholders to achieve agricultural-based economic growth.

Endline interviews with community development officers highlighted broad constraints households face in accessing loans and using CCROs for collateral, including low financial literacy and knowledge, lack of business skills and ability to utilize a loan for profitable activities, and complicated and lengthy borrowing procedures from banks. KIIs with DLOs highlighted a need for additional education on the part of farmers and financial institutions, and coordination assistance to better assist farmers with CCROs to access and navigate the financial services potentially available to them. One DLO interviewee mentioned the need for institutions on both ends (meaning farmers within villages on the demand side and banks on the supply side) to align and coordinate with each other and with the DLO to conduct education campaigns and assist villagers in navigating the loan process:

“To help this normal farmer to secure a loan, the project needs to support the entire process and not [just provide a CCRO and then] leave the farmer alone.” – KII with DLO town planner

DLO and LTA staff recognized villagers’ lack of familiarity with commercial banks’ borrowing process and sought to play a bridging role under LTA. The quote below enumerates many of the challenges that a land sector project would likely need to overcome or provide support for to help ensure that villager and government expectations are realistic and to increase the potential for CCROs to serve their envisioned role in expanding rural villagers’ access to formal sources of credit. This support includes:

- On the supply side: awareness raising and potentially regulatory change to make banks’ acceptance of CCROs more palatable or feasible.
- On the demand side: education to villagers on financial literacy and on the loan process, requirements, and risks; support for loan applications and realistic business plans given an individual’s landholdings and related business situation; and improving villagers’ physical access to banking institutions.

“One thing that I have seen was that, some banks did not recognize [a] CCRO as true collateral which is a challenge. Another challenge is that citizens have been in despair with the banking lengthy procedures. Another challenge is that other villages are far from where the banks are, like even 75 kilometers, [so] it becomes a challenge. Also, some citizens own lands that does not worth much, yet they want a lot of money from the banks. They maybe [have] only plain land, and yet they want up to a 20 million TZS loan and its just 10 hectares to 15 hectares [of land that they have]. When the banks do its evaluation, they realize that [the] bank cannot give more than 5 million and the villagers get frustrated without knowing that the banks also want to be secure in situations where they default from paying the loans.” – KII with DLO staff

With respect to banks’ supply-side issues, DLO staff also mentioned that banking institutions are still early in their process of recognizing and using CCROs in the credit process, and those processes

¹¹⁴ This reflects the average time between CCRO receipt by Phase I and Phase II LTA households and IE endline. The full range, dependent on village, was 15-36 months as there were a small number of villages in which CCROs were distributed early in 2017 or toward the end of 2018.

need to be better developed. One MOL interviewee saw banks as the major constraint and noted that some major banks in Tanzania, such as NBC, still do not accept CCROs as collateral for a loan.¹¹⁵ One disincentive that banks face is the high fee they must pay to register a CCRO, an issue that LTA sought to resolve as part of its work with the MOL.

However, other respondents expressed caution on whether rural villagers were sufficiently informed on aspects of the credit process with formal institutions and highlighted the potential risks involved for rural landholders to use CCROs as collateral, including from predatory lenders. Ward-level CDO respondents suggested that villagers needed more information and guidance on using the CCRO for collateral and the potential risks of losing their land if they cannot repay the loan.

“Now since they have a legal ownership document it can help to put it as a collateral to buy seeds, fertilizers, insecticides etc. [However], We did not suggest the community to put the land ownership document as collateral to get cash since many organizations would come to enter in partnership with the community claiming to provide loans and collecting the CCRO and at the end when the community fail to repay the loans, the land is taken. That is why we used to be accompanied with banks and government institutions that are well known.” – KII with ward-level CDO

Ultimately, nearly all of DLO, CDO and MOL interviewees agreed that villagers’ lack of profitable and creditworthy businesses or activities was a major impediment that would need to be overcome for CCROs to serve as the anticipated link to expanded access to credit for rural households in Tanzania. Absent activities that banks would find loan worthy, having a CCRO is unlikely to matter.

“A villager may have a CCROs but [is] ineligible to get loan. Banks look at how you can repay your loan! So, they assess the kind of agriculture you are doing and if they find that [your] agriculture business may repay, then they provide loan...they cannot see your plain land and give you loan. Banks have their own indicators used to assess the value of land, and not just [having a] CCRO alone.” – KII with MOL staff

“[A] CCRO is not the only guarantee to securing a loan and I think in getting loans you should have something that will convince the financial institutions to give you a loan and not just because you have a CCRO, but it’s just a collateral they would use in case of defaulters. But again, great education is needed to empower people to come up with projects that they would use to repay the loans. Also, we expect after taking the loans, farmers will use the loan to invest more on the piece of land. What the bank normally looks at is if you can return back the loan.” – KII with MOL staff

Endline interviews also suggested some emerging unintended uses of CCROs. Two DLO staff mentioned an example from one village where individuals had apparently used their CCROs to secure bail in a court proceeding. According to the interviewees, those who were able to produce a CCRO were released on bail until the court date, while those who could not had to stay in prison until the case was closed.¹¹⁶

FOOD SECURITY

Food security increased across LTA and control group households between baseline and endline, with male-headed households reporting greater food security than female-

¹¹⁵ Access Bank, CRDB Bank, National Microfinance Bank and Mkombozi Bank were all noted as willing to accept CCROs as collateral for a loan.

¹¹⁶ However, the implications of this and potential risks to the defendants who used CCROs to post bail were not clear. In general, the IE team’s inability to collect qualitative data with LTA beneficiaries limited the extent to which the team could explore the potential formal and informal uses for CCROs that landholders may be engaged in and the reasons why - and particularly for their use in informal or group lending contexts within communities.

headed households. A key aspect of the LTA theory of change is that strengthened tenure security through the issuance of CCROs will eventually lead to improved agricultural productivity and income, which in turn is expected to lead to increased food security for households. The IE team used the Household Hunger Scale, which was developed through USAID's FANTA III activity, as a measure of food insecurity within households. This experience-based scale ranges from 0 – 6 and captures the most extreme manifestations of food insecurity.^{117,118} It collapses dimensions of food security into an index, with higher numbers suggesting more severe food insecurity.¹¹⁹

Overall, the IE results suggest a small proportion of households in both assignment groups experienced severe hunger and saw little change on that over time. At baseline, the proportion of households with severe hunger was 4.3 percent for the treatment group and 6.2 percent for the control group. At endline, the proportion was 6.0 percent for the treatment group and 7.0 percent for the control group. Moderate hunger was more prevalent but declined from baseline to endline for both assignment groups. At baseline, the proportion of households that experienced moderate hunger was 26.9 percent for the treatment group and 27.5 percent for the control group. At endline, the proportion was 22.4 percent for the treatment group and 20.7 percent for the control group.

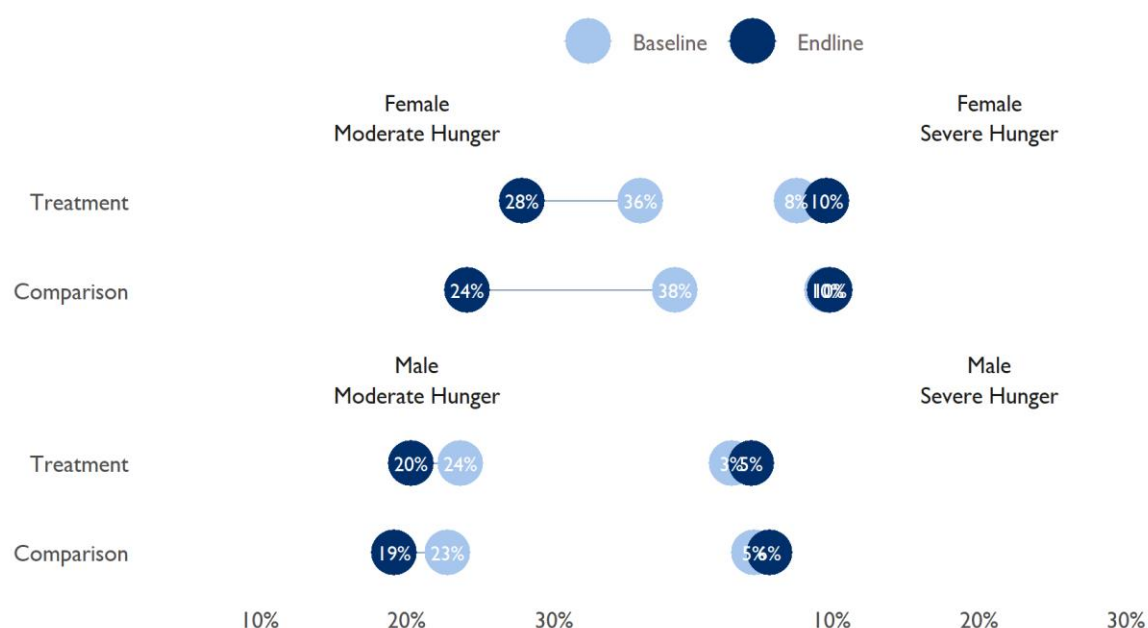
Disaggregating by gender of household head, a greater proportion of female-headed households reported moderate or severe hunger in the household at each round and across both assignment groups. The proportion of female-headed households with severe hunger was close to 10 percent and roughly double that of male-headed households in each round and across assignment groups (Figure 38). There was greater variation in the proportion of female-headed households with moderate hunger across assignment groups, although the proportion of female-headed households with moderate hunger declined for both LTA and control group female-headed households from baseline to endline (the change for male-headed households was much smaller, but also showed a small decline). For the LTA group, the proportion of female-headed households experiencing moderate hunger decreased from 35.9 percent at baseline to 27.8 at endline. For the control group, the decline was larger, from 38.2 percent of female-headed households at baseline to 24.1 percent at endline.

¹¹⁷ INDDEx Project (2018), Data4Diets: Building Blocks for Diet-related Food Security Analysis. Tufts University, Boston, MA. <https://inddex.nutrition.tufts.edu/data4diets>. Accessed on 20 October 2020.

¹¹⁸ The Household Hunger Scale score can also be converted to a categorical variable, where households are categorized as follows: "little to no hunger in the household" (0-1), "moderate hunger in the household" (2-3), or "severe hunger in the household" (4-6). (Ballard et al., 2011)

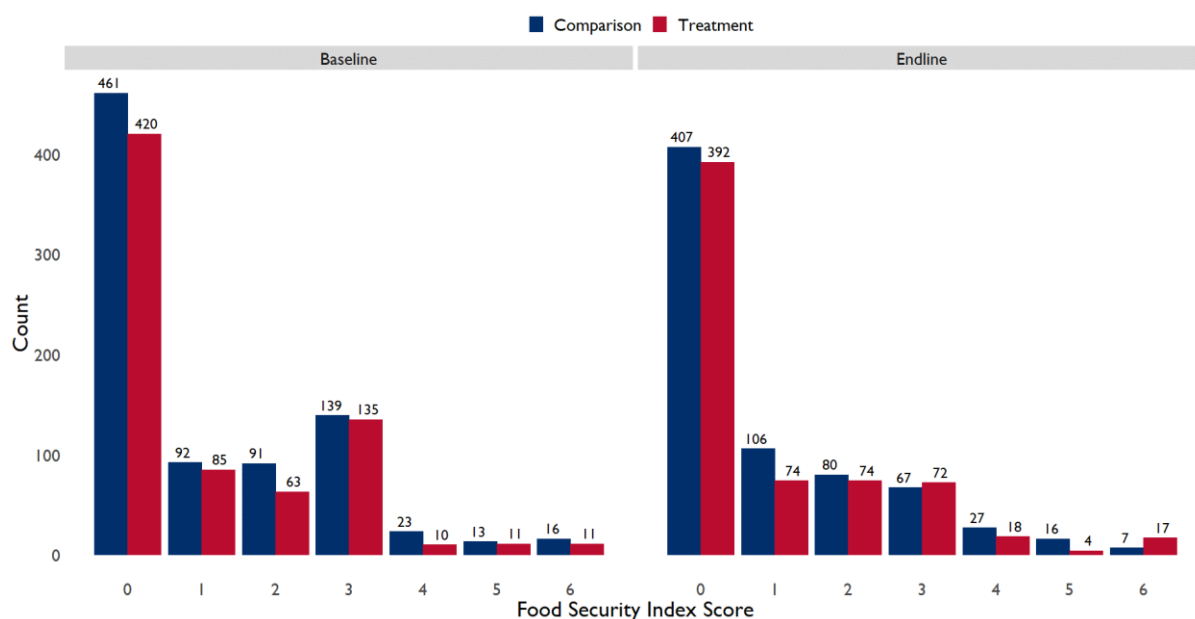
¹¹⁹ See Ballard, Terri; Coates, Jennifer; Swindale, Anne; and Deitchler, Megan. 2011. *Household Hunger Scale: Indicator Definition and Measurement Guide*. Washington, DC: Food and Nutrition Technical Assistance II Project, FHI 360.

FIGURE 38: SEVERE AND MODERATE HUNGER BY ASSIGNMENT AND ROUND



The number of households with moderate hunger (Household Hunger Scale scores of 2 or 3) fell from 198 LTA households at baseline to 146 at endline (Figure 39). Female-headed LTA households went from an average hunger score of around 1.5 at baseline to 1.34 at endline, while male-headed LTA households went from an average score of 0.91 to 0.82. Notably, the decline in the average hunger score for male-headed control group households was much smaller, from 0.93 to 0.88 between baseline and endline, while female-headed comparison households experienced a greater average improvement, going from 1.58 at baseline to 1.2 at endline ($p=0.01$).

FIGURE 39: FOOD SECURITY INDEX BY ASSIGNMENT AT BASELINE AND ENDLINE



There was slight variation in food security for households in areas with higher building density. LTA households in areas with building density above the 90th percentile had an average hunger score of 0.51 at endline, which was a decline from a baseline average of 1.06. In contrast, LTA households in areas with building density below the 90th percentile had an average score of 1.01 at endline and little change from the average of 1.06 at baseline.

Control group households reported slightly different results, with those in areas with greater building density reporting an increase in average hunger score from 0.93 at baseline to 1.18 at endline, suggesting an *increase* in food insecurity. Indeed, male-headed control group households in areas with more building went from an average hunger score of 0.64 at baseline to 1.08 at endline, while female-headed control group households improved slightly over the same period, going from an average of 1.64 to 1.4. Control group households in areas with building density below the 90th percentile went from an average hunger score of 1.16 at baseline to an average of 0.95 at endline, suggesting a small improvement, which appears to largely be driven by a 25 percent decrease in food insecurity among female-headed control group households (from 1.57 to 1.17).

IMPACT ANALYSIS RESULTS

The IE team ran two models to estimate LTA's impact on the economic outcomes of interest in this section. The team used a logistic regression model to estimate LTA's impact on binary outcomes (i.e., yes/no measures of whether respondents borrowed money). The team used a linear regression model to estimate LTA's impact on continuous outcomes such as income from annual crops. For the continuous outcomes, the team also ran ANCOVA models that controlled for baseline characteristics of the outcome variable in estimating LTA's impact on that variable at endline. In cases where auto-correlation is low (i.e., where baseline measures are not strongly correlated with endline measures) ANCOVA models can improve the statistical power of estimates.

LTA did not appear to have a statistically meaningful or significant impact on whether respondents reported borrowing from any source for both heads of household and wives/spouses, food security, income, or the amount borrowed (Figure 40).

FIGURE 40: BINARY OUTCOME IMPACT ESTIMATES

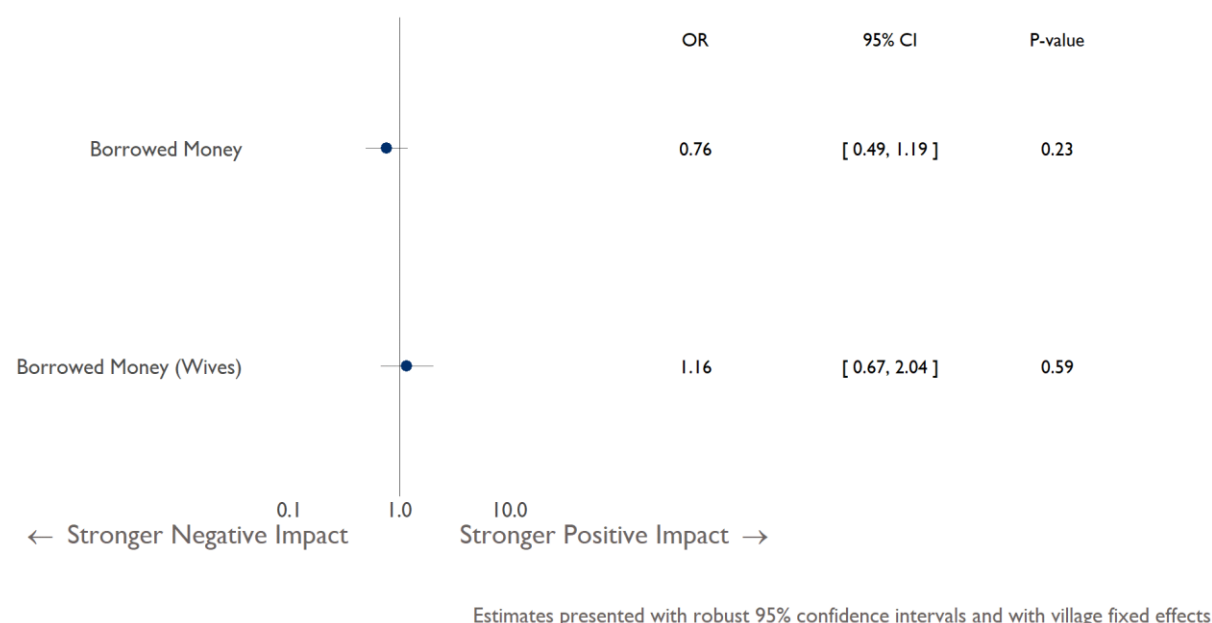
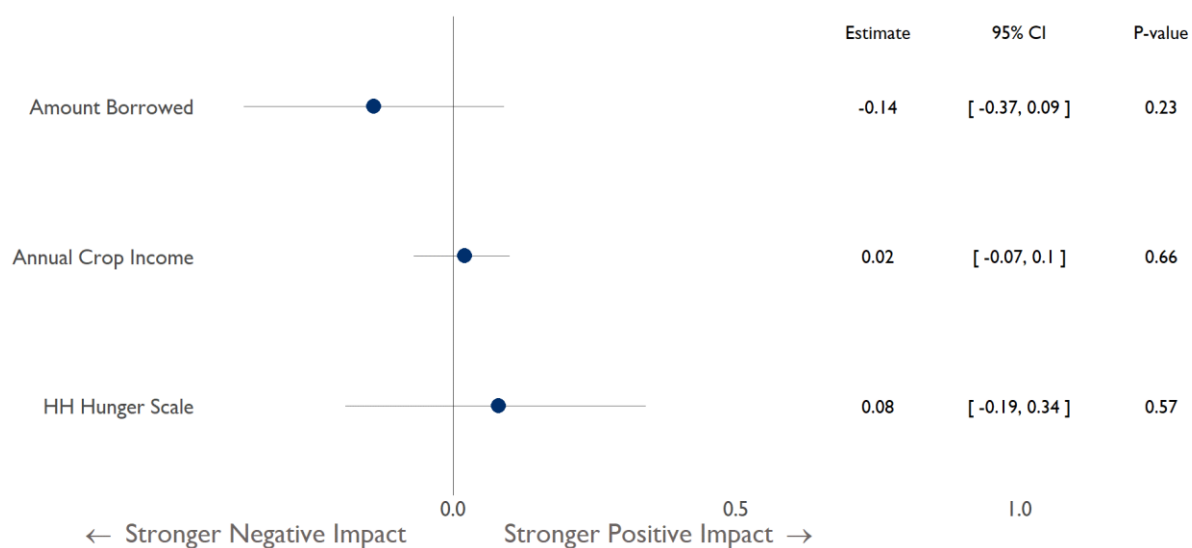


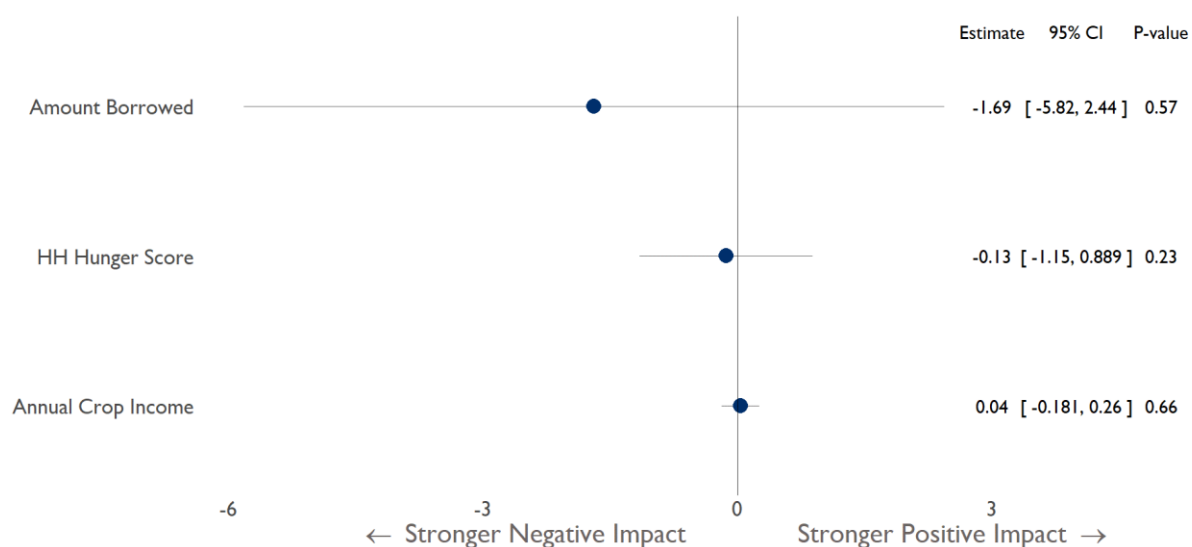
FIGURE 41: CONTINUOUS OUTCOME IMPACT ESTIMATES¹²⁰



Estimates presented with robust 95% confidence intervals and with village fixed effects

The ANCOVA results (Figure 42) largely confirmed the main model findings but serve as a potential sensitivity check for the main model estimates.

FIGURE 42: ANCOVA ESTIMATES



Estimates presented with robust 95% confidence intervals and with village fixed effects

DISCUSSION AND CONCLUSIONS

From a development perspective, one of the most crucial elements of the hypothesized causal chain for customary land formalization is that it will facilitate increased credit access and agricultural investments by landholders in ways that will boost rural smallholders' agricultural productivity, agricultural-based income, and broader economic wellbeing. In Tanzania, the CCRO provides legal documentation of the land user's customary rights to the land and clarifies the boundaries of the

¹²⁰ Impact estimates are reported as standard deviations from the mean.

parcels. This is expected to not only increase land users' tenure security but also incentivize landholders to make productivity-enhancing investments or otherwise change how they use land in ways that will improve their economic situation. As reported in EQ3, the IE did not find evidence of a substantial impact of CCRO provisioning on land investments at this stage, roughly 2-2.5 years post-receipt of CCROs.

Given the lack of evidence for a substantial change in land investments, it may not be surprising that the IE team also found little evidence in EQ5 for an effect of CCRO provisioning on farm earnings or other indicators of changes to agricultural productivity. There was, however, some descriptive evidence of differing trends on farm earnings across LTA and control group households depending on their urbanization context, with LTA households in urbanizing contexts (i.e., with above-average building density) tending to report lower farm incomes than their control group counterparts. The IE team's inability to conduct full endline qualitative data collection limited the extent to which it could explain or better contextualize such findings.

The IE findings of a lack of evidence for impact on farm earning is also consistent with much of the existing literature on customary land formalization, which also found little evidence for an effect of strengthened tenure security on household income or economic wellbeing.¹²¹ To some extent, there is growing recognition in the sector of a need to more closely examine whether the anticipated causal chain from improved tenure security to land investment, agricultural productivity, and eventually, income, is correct – or at least to better articulate the circumstances and contexts under which this pathway is more or less likely to hold. At the same time, Higgins et. al. (2018) appropriately point out that most of the rigorous studies conducted on this to date based their results on endline data collection within a few years of receipt of formalized land documentation, as has been the case for this IE as well. Two or three years post-receipt of formalized customary land documentation may be too brief for these longer-term outcomes to accrue at scale.¹²²

With respect to food security, there was also no evidence LTA's CCRO provisioning had a significant impact on household food security at this stage, although food security did increase among both LTA and control group households during LTA and the proportion of households experiencing moderate hunger declined. This was particularly so for female-headed households in both assignment groups. Similar to the results on farm earnings, there was also some descriptive evidence of differing trends across the assignment groups depending on the urbanization context. LTA households in urbanizing contexts saw a fairly substantial decline in reported food insecurity, while control group households in urbanizing contexts saw the opposite trend – an increase in food insecurity that appeared to be driven primarily by a large increase in food insecurity by male-headed households in such contexts. LTA households in non-urbanizing contexts saw little change in their food insecurity while control group households in non-urbanizing contexts saw a small improvement that appeared to be driven primarily by decreased food insecurity among female-headed households in that context.¹²³

It is difficult to contextualize the IE results on food security within the broader evidence base, as few studies have focused on linkages between land formalization and food security. Of those that have, the evidence to date has been mixed.¹²⁴

A second channel through which the CCRO is anticipated to potentially improve economic wellbeing is by enabling the landholder to access more formalized sources of credit and in larger

¹²¹ For example, see Higgins et. al. 2018 and Lawry et. al. 2017.

¹²² Per Higgins et al (2018): "longer-term studies are required that allow a long enough time for the full chain's validity to be reliably assessed."

¹²³ While one can think of plausible ways LTA's households' possession of a CCRO in such rapidly urbanizing contexts could play a role in improving their situation such that their food insecurity declined, the IE team's inability to conduct full qualitative data collection at endline limits its ability to speak to this issue.

¹²⁴ See Higgins et al. 2018.

amounts, through the use of the CCRO as collateral for a loan or potentially through other roles the document may play in the borrowing process.¹²⁵ In this vein, the CCRO has long been promoted in Tanzania as a gateway to credit and economic growth for rural households.¹²⁶

Although the IE results for EQ1 and EQ2 showed that CCRO provisioning increased household tenure security and reduced households' land disputes and concern over future land disputes, use of CCROs to access credit by endline was still uncommon. There was also no substantive change in the borrowing rate as a result of obtaining a CCRO, although a small change was observed in the sources of credit households accessed. Neighbors and friends remained the most common source of credit, but borrowing from VICOBA's showed a small increase among LTA households (however, the overall borrowing rate among households in the sample was too small for a formal test of impacts of the CCRO on this). Borrowing from commercial banks was the third most common credit source in LTA villages, comprising 13 percent of borrowing households. With respect to women's credit access, the IE data showed wide gender disparities in borrowing sources and in the amount of credit obtained.

Still, the small number of LTA households that reported using their CCROs in the borrowing context is reason for optimism on seeing more of this over time. The multiple types of borrowing contexts in which households had used the CCRO is also intriguing and lends support for the notion that the CCRO is likely to develop many potentially unintended uses within both formal and informal lending sectors – and potentially many other sectors as well (as is often the case within a continent known for rapid innovation and informal sector repurposing of products and tools for a range of tailored needs).

Formalized land rights are clearly an important step in unlocking formal sources of credit and economic opportunities for the rural poor, but the IE's qualitative findings show that substantial demand- and supply-side barriers may also need to be addressed before this can be realized at scale. Those findings also provide insights into the type of companion support that future land sector programs may want to consider. These include farmer financial literacy and knowledge about loan processes and products, business skills and ability to utilize a loan for profitable activities, and working with banks to clarify procedures and develop appropriate lending products for rural smallholder farmers.

Even if the CCRO is not used directly as collateral, it is possible the document could still help facilitate smallholder farmers' access to credit from less formal sources or in increased amounts.¹²⁷ In theory, the land document could provide potential lenders in formal or informal settings with additional information about the applicant's landholding and capacity for agricultural production or otherwise shed light on their ability to repay the loan, potentially improving lenders' ability to identify less risky or more creditworthy applicants and appropriately tailor the size of the loan.

The IE results on credit access are consistent with the few other studies known to the IE team that looked directly at the role of CCROs in unlocking smallholders' access to credit in Tanzania. A 2014 study conducted across 30 villages in 6 districts of the country also found no evidence of a link between CCRO possession and improved access to loans among the 1,500 households surveyed. In that study, 32 percent of households surveyed said they would apply for loans if they had a CCRO

¹²⁵ This is an emerging area of study. Possibilities might include helping a formal or informal lender gauge loan risk or appropriateness of a loan amount for agricultural-based activities, and the individual's capacity for repayment, by providing confirmation of the applicant's landholdings. The document could also serve as a form of guarantee or indication of an individual's creditworthiness in group lending settings, whether through informal groups or more formal financial institutions.

¹²⁶ See Stein et al. 2016.

¹²⁷ The convenience and flexibility of less formal savings and loan options may also be more attractive for many rural farming households. Most Tanzanians still derive their income primarily from farming activities and do not have consistent sources of income or reliable income streams throughout the year (FinScope 2017).

but only 1 of the 91 respondents who had a CCRO reported using it as collateral to obtain a loan from a commercial bank. Another three respondents had used the CCRO as part of the borrowing process from less formal loan sources (NGOs or savings and credit cooperatives), similar to this IE's findings for LTA. Interviews with banking-sector representatives from that study highlighted a view that poor rural farmers practicing primarily rain-fed agriculture on small land plots are simply too risky an investment for banks, particularly without state-mediated risk sharing or other guarantees.¹²⁸

Managing expectations around the role of tenure strengthening, CCRO provisioning, and expanded credit taking also requires keeping in mind the current general borrowing context in Tanzania and common reasons why households borrow. Recent financial inclusion surveys from Tanzania continue to show that while borrowing is fairly common, the overwhelming reason that households borrow money is to meet immediate cash needs for household expenses and emergencies.¹²⁹ For example, FinScope 2017 found that the most common source of borrowing was from family and friends, as was also the case for this IE, and only 19 percent of borrowing was related to productive investment such as starting or expanding a business or for farming expenses. Similar to this IE's results from Iringa District communities, commercial bank utilization nationally was just 13 percent in 2017.¹³⁰ Against that broader backdrop, land sector formalization projects may need to examine feasible targets for expanded credit access in the context of CCRO provisioning, the timeline required to achieve this, and what type of complementary support to households may be necessary in the years post-receipt of CCROs to help them achieve greater entry into formalized credit systems.

With respect to women's access to loans, studies from Tanzania have shown gender parity among those who have loans but substantial gendered differences in the source of the loan. Stein et al. (2016) found that 75 percent of formal bank loans were held by male respondents in their survey sample, while 72 percent of loans from NGOs and savings and credit cooperatives were held by women.¹³¹ Previous studies have also highlighted that women tend to participate in informal savings groups at a higher rate than men, which may also reflect NGO and donor-supported efforts to target women for the establishment of such groups. This may also help explain women's generally lower loan sizes, as informal savings groups typically have much lower maximum lending ceilings than formal banks.

Despite the often high participation in informal savings and loan groups, a 2018 study across eight districts in Tanzania also found high dissatisfaction with the extent to which informal savings group participation met respondents' personal borrowing needs. Reasons cited included conservative limits on borrowing amounts, insufficient capital within the group, and problems with members not repaying loans.¹³² Demand for loans from more formal sources was high but respondents also expressed concern about taking a loan or using their house or farm for collateral, particularly without having sufficient financial literacy, training (including on how to use a loan profitably), or help with the loan process.

The lack of evidence for an effect of CCRO provisioning on credit access from this IE and other studies from Tanzania is also consistent with the broader set of impact studies of customary land formalization from sub-Saharan Africa and elsewhere. Higgins et. al.'s 2018 synthesis found mixed results with respect to support for impacts on credit access. In that synthesis, the positive findings

¹²⁸ See Stein et. al. 2016.

¹²⁹ FinScope Tanzania 2017, Financial Services and Financial Inclusion Survey. Forty-four percent of adult Tanzanians had borrowed in the 12 months prior to survey, but 74 percent of that borrowing was to meet immediate cash needs for household expenses and emergencies.

¹³⁰ See FinScope Tanzania 2017.

¹³¹ The preponderance of loans to women from NGOs and SACCOS has been suggested to result from a greater institutional focus on women's empowerment among those types of lending programs.

¹³² Andrew, D., J. George, L. H Sekei, and P. Rippey. 2018. *Insights on the preferences and usage of financial services by savings groups in Tanzania*. Mastercard Foundation and Oxford Policy Management.

for an effect of land tenure strengthening on land investments, together with a lack of evidence for increased access to credit, raised the possibility that in many contexts, households' financial means may not be the key limiting factor with respect to their decisions on land investments.

Ali et. al.'s (2014) study of land regularization in Rwanda also did not find evidence for impacts on credit access, although broader context has parallels to the Tanzanian situation. As for this IE, credit access overall was low in their sample in Rwanda. As important, at the time of that study there were high registration fees for banks to register mortgages, no national system to register land transactions, and the process to register a mortgage was not connected to the land registry system. Under such conditions, the authors highlighted that it would be unlikely to expect a change in household credit access as a result of customary land formalization.¹³³ While the current situation in Tanzania is an improvement over this, several of these limitations still exist to some extent or in some form.

Lastly, from a gender standpoint, many of the findings for EQ5 also underscore several known challenges related to reducing gender inequities in smallholder agricultural settings in Tanzania and elsewhere. For this IE, men reported significantly higher average farm earnings than women and had a higher rate of borrowing from more formal sources of credit, while male household heads' average reported loan amount was approximately double that of female household heads. Moreover, the proportion of female-headed households that reported experiencing severe hunger was roughly double that of male-headed households in each survey round and irrespective of assignment group.

CONCLUSIONS

The IE's initial findings on tenure security and land disputes provide strong positive indications that early steps on LTA's envisioned causal pathway are underway. Within three years of household receipt of formalized customary land documentation, LTA achieved some significant positive impacts toward increasing tenure security and laying the groundwork for sustainable agricultural investment for smallholder farmers. This included a large and significant positive impact on household tenure security and documentation of land rights, a reduced likelihood of current and future land disputes, and a smaller positive impact on use of communal land. Qualitatively, the IE results also suggested some tangible and important improvements to women's empowerment, including women's increased access to land resources and tenure security. For some other short-term outcomes related to tenure security, the IE observed a similar magnitude of positive change across both LTA and control group villages that suggested general improvements to tenure security and land administration conditions across Iringa District during LTA. The IE's qualitative findings suggest that LTA's broad capacity building to the DLO could be a plausible explanation for this result.

LTA did not appear to impact the likelihood of fallowing, crop diversification, household land investments, access to credit, or other indicators of household economic wellbeing during that timeframe. The results for land investment outcomes pointed to some positive movement in the anticipated direction in terms of productivity-enhancing investments like soil conservation, use of fertilizer, expansion into more permanent crops and crop diversification. However, the IE did not find evidence at this stage that households' improved tenure security and possession of formalized land documentation through LTA spurred them to make new or different investments into their land – or at least not at a magnitude that the IE could detect.¹³⁴ The endline qualitative data highlighted that while CCRO provisioning is viewed as essential to laying the foundation for farmers' land

¹³³ They also pointed out that a link between land formalization and expanded credit access would be unlikely to occur in the absence of an accessible and affordable system to access land information (an integrated land and mortgage registry system within the financial sector). Thus, support to developing or enhancing the functionality and accessibility of such systems would likely be needed as well.

¹³⁴ The LTA IE was not powered to detect very small changes in effect sizes on any of the outcomes assessed.

investments, broader farming and market constraints will also likely need to be addressed as facilitating conditions before landholders in the LTA context can do so effectively.

From a development perspective, one of the most crucial elements of the hypothesized causal chain for customary land formalization is that it will facilitate increased credit access and agricultural investments by landholders in ways that will boost rural smallholders' agricultural productivity, agricultural-based income, and broader economic wellbeing. In the Tanzanian context, the CCRO provides legal documentation of the land user's customary rights to the land and clarifies the boundaries of the parcels. Given the lack of evidence for a substantial change in land investments, it was not surprising that the IE also found little evidence for an effect at this stage of CCRO provisioning on farm earnings or other indicators of changes to agricultural productivity.

In addition, use of CCROs to access credit by endline was still uncommon. As has been the case for many land formalization studies, the LTA IE results on access to credit, land investments, and productivity highlight a need for additional data collection beyond the few years after receipt of formalized land documentation to better understand the longer-term effects. Formalized land rights are an important step in unlocking formal sources of credit and economic opportunities for the rural poor, but the IE's qualitative findings also showed that substantial demand- and supply-side barriers may also need to be addressed as facilitating conditions before this can be realized at scale.

Economists have long argued that formalization of property rights can play an important role in facilitating access to credit for the poor, primarily through the use of the land as collateral for a loan. Together, increased credit and land-based investment may also work in tandem to improve the landholder's agricultural outputs, income, and economic wellbeing. However, there is little evidence of a clear effect of land formalization on access to credit in sub-Saharan Africa.¹³⁵ The likelihood that the CCRO will lift Tanzania's rural poor out of poverty through the envisioned causal pathway has also been questioned, in part due to concerns on administrative capacity for land administration within villages and at higher levels, but also related to many contextual and regulatory factors.¹³⁶

With respect to the use of CCROs as collateral, there has been debate as to whether sufficient safeguards are in place to ensure landholders understand the consequences of foreclosure and protect them from unfair land seizures by lending institutions. Banks, in turn, have also been reluctant to register or lend against CCROs. Some studies have pointed to banks' disinterest in lending to smallholders due to institutional biases and a perceived lack of profitability. Moreover, banks' prerequisites for obtaining loans are often extremely difficult for rural farmers to meet.¹³⁷ The typically low levels of financial literacy in rural villages mean that programs that encourage rural smallholders to use their land as collateral for loans via the CCRO must also take care not to inadvertently increase farmers' vulnerability to losing their land in cases where the risk of loan defaults may be high.

Although the IE found limited evidence of the use of CCROs in accessing credit at this stage, there were some examples in which households had used the CCRO in the borrowing context. In theory, household access to formal sources of credit is expected to be easier once households have CCROs, thus potentially bridging a long-recognized need to increase rural farmers' access to credit and enabling households to access substantial loans by using their CCROs as collateral.

The IE results in many ways align with findings from other impacts studies of customary land formalization in a range of contexts in sub-Saharan Africa. For example, a recent systematic review

¹³⁵ See Besley 1995; Place and Migot-Adholla 1998; Musembi 2007; Higgins et al. 2018; and Bizoza and Opio-Omoding 2021.

¹³⁶ See Sundet 2004; Stein et al. 2016.

¹³⁷ Prerequisites typically include having a savings account with the bank that contains a minimum specified balance, undergoing property assessments, submitting a business plan, and navigating the paperwork steps for the application (Stein et al 2016).

of the effects of increased land tenure security across 59 rigorous studies found evidence for positive impacts on productivity-enhancing agricultural investments and on female empowerment, but not on agricultural productivity, access to credit, or income.

Finally, the IE team notes that the voices of individual villagers and village-level governance institutions were less represented in the IE analysis and interpretation than initially planned and is typically desired in an endline analysis, due to COVID-19. While the team conducted KIIs with CLO and CDO staff, it was not able to hear directly from individual LTA beneficiaries and this may have limited its interpretations on certain outcomes. This is likely the case in particular for the evaluation theme focused on empowerment issues, as qualitative data collection plays a particularly important role in obtaining men's and women's perspectives on a range of complex issues that are best discussed and analyzed qualitatively and are not as well captured in quantitative survey data.

RECOMMENDATIONS

FOR USAID, LTA, AND FUTURE IMPLEMENTING PARTNERS REGARDING CUSTOMARY LAND FORMALIZATION PROGRAM DESIGN

To ensure that all Iringa District villagers benefit from systematic CCRO provisioning, extend LTA to control group villages and all remaining eligible villages in Iringa District. Also, consider possibilities for expanding LTA or the model of support to DLOs to other SAGCOT districts.¹³⁸ The IE results point to clear and positive impacts of LTA's CCRO provisioning on customary landholders' access to formalized land document, perceived tenure security, and likelihood of experiencing future land disputes. These results lay the foundation for incentivizing landholders to invest in their land and obtain envisioned positive agricultural and economic impacts further along the causal chain. Nearly all MOL, DLO, and CDO interviewees advocated for LTA to extend its work throughout Iringa District so that all villagers could benefit from systematic CCRO provisioning. By the IE endline, expansion of LTA was already planned or underway in a set of remaining eligible villages in Iringa District. Moreover, LTA's coordination with the IE team on randomized village selection for receipt of LTA interventions during the activity's initial phase means that the control group of villages is a logical population to receive a follow-on phase of LTA.

To facilitate stronger potential for CCROs to play their envisioned role in improving rural households' economic situation, consider coupling or synchronizing future CCRO provisioning programs with complementary: (1) targeted agricultural extension and market linkages support to villagers within identified value chains, and (2) financial literacy, financial services, and business development support once the CCROs are obtained. The IE results clearly showed that while important early steps were underway on the envisioned causal pathway from customary land formalization to improved and sustained economic wellbeing for rural customary landholders, anticipated impacts on land investments, productivity, and household economic wellbeing had not yet emerged. The results also highlighted key contextual barriers that suggested access to a CCRO was unlikely to be the sole or potentially even the primary limiting factor for rural households' economic growth in the Iringa rural context. In such contexts, where farmers still primarily engage in subsistence agriculture focused on a small number of annual crops, and financial literacy and entrepreneurship skills are low, land formalization projects should consider how complementary support to improve farmers' skills, help them diversify their crops and transition to more commercially-oriented agriculture, together with associated financial literacy and business development skills, can be used to strengthen rural smallholders' capacity to leverage the CCRO and use their land to achieve agricultural-based livelihoods improvement and

¹³⁸ In early 2021, after the approval of this report, LTA reported that they plan to operate as an independent NGO with the goal of scaling-up in Iringa, as well as two other SAGCOT districts.

overall economic growth. Opportunities for this type of strategic programming complementarity on these potential facilitating conditions seem particularly logical to explore in a district such as Iringa, as it is already a focal area within a major strategic agricultural development initiative (SAGCOT). Given SAGCOT's broader objectives, this type of complementary programming may also help strengthen or make more explicit the role of land formalization projects and their outcomes for smallholders within such broader sustainable development initiatives.

To facilitate stronger potential for CCROs to serve as a link to rural households' expanded access to credit, consider providing targeted support to address key demand- and supply-side constraints on lending for CCRO recipients, whether through formal or informal lenders. Formalized land rights are an important step in unlocking formal sources of credit and economic opportunities for the rural poor, but the IE findings show that substantial demand- and supply-side barriers likely will also need to be addressed before this can be realized at scale. The IE found limited evidence for household use of CCROs in the borrowing process by endline, which provides a reason for optimism that this trend may continue to expand. However, the IE results also point to substantial supply- and demand-side barriers that likely would need to be addressed for CCROs to serve their long-promoted role as a gateway to credit for rural Tanzanian households. The IE results show a low rate of household borrowing from commercial banks and a continued reliance on neighbors, friends, and other informal sources of credit to meet household borrowing needs, consistent with the general borrowing context across rural Tanzania. Findings on the small use of CCROs in the borrowing process are also consistent with existing studies in Tanzania. The IE's qualitative results highlighted a need to provide support to CCRO recipients to enable them to better understand and navigate a loan process, particularly from formal sources of credit such as commercial banks. This includes strengthening their understanding of risks associated with using land as collateral via their CCRO in both formal and informal lending contexts. Equally important, farmers need support to strengthen their ability to utilize a loan for profitable activities.

Thus, demand-side support to rural CCRO recipients may need to particularly consider aspects of farmer financial literacy and knowledge about loan processes and products, risks of using land as collateral for a loan, business skills development, and ability to utilize a loan for profitable activities. On the supply side, land formalization projects may need to consider undertaking more explicit work with banks to clarify loan procedures and develop appropriate lending products for rural smallholder farmers, and how the project might be able to serve as link to connect formal lenders to rural CCRO holders that have developed viable activities or business plans. Finally, the IE results demonstrated clear disparities in loan sources and amounts for women borrowers relative to men, which is consistent with existing literature. Given these differences, support to CCRO holders on credit access and the borrowing process should target men and women landholders differently and work to understand and provide support that explicitly addresses women's credit needs, economic goals, and gendered borrowing constraints.

To sustain DLO's service delivery on customary land formalization after LTA, consider targeted trainings for the DLO to enhance its capacity for sustained post-formalization service delivery to communities that received CCROs and to conduct systematic village-wide registration in communities that have not yet received them. The IE found strong support for LTA's capacity building to the DLO, with substantial perceived improvements to the office's ability to undertake CCRO provisioning and related aspects of customary land formalization. However, concerns such as high staff turnover and the general resource context suggest that additional support to sustain high-quality service delivery following LTA may be warranted. In particular, DLO interviewees pointed to several additional training needs or requests to enhance the office's capacity for sustained service delivery, including:

- Develop a targeted standalone training package on all aspects of VLUP and CCRO provisioning for DLO staff, as a long or short course, to improve their knowledge and

enable further growth of the department across multiple staff. This could be developed to serve multiple DLOs beyond Iringa District.

- Provide additional training and support to modalities for land transactions.
- Given peri-urbanizing trends in Iringa District, provide training to the DLO on detailed land-use planning that would enable support to villages to better plan for transitions from a village to a more urban area, including roads planning and other aspects that might help to more strategically anticipate planning for eventual growth and transformation into more peri-urban areas.

To strengthen broad-based knowledge on land laws and land rights among vulnerable groups within villages, consider adapting targeted trainings and information dissemination to ensure coverage across all key subgroups including female household heads. LTA households reported an improvement in their knowledge of land laws and land rights during the activity. However, reported familiarity on this was lowest among female-headed households in LTA villages, where only 16 percent of female household heads said they were familiar with land laws. Among control group households without CCROs, reported familiarity with land laws was also lowest for female-headed households. LTA is commended for its targeted approach to conducting sensitization efforts and trainings on this for women in villages where it operated. However, the results for female household heads suggest a need to adapt this approach (for example, in terms of timing or frequency of meetings, how information is disseminated more broadly beyond direct attendees, or other factors that may inadvertently hinder participation by female household heads) to ensure that female household heads or members of their households are not inadvertently less able to benefit from the process.

To help identify and ensure that some households are not inadvertently disadvantaged through systematic village-wide CCRO provisioning, land formalization projects should consider having a clear grievance system in place for villagers and developing a system to track and potentially assist households that may experience de facto land dispossession through the land formalization process. LTA is commended for achieving widespread provisioning of CCROs in the villages in which it worked. Still, the IE results indicate that a small proportion of LTA households were not able to obtain a CCRO for some or all of the parcels they customarily held prior to the intervention, and such households appeared to have higher tenure insecurity at endline and in strong contrast to their village peers that received CCROs. While LTA's tracking system was not designed to identify this and the IE team could not independently confirm if any households were completely dispossessed of their land through LTA, district- and ward-level interviewees suggested that a few households may have lost land under this process, albeit land that they technically were ineligible to register and title in their name. No compensation was provided in such cases. Even when households were eligible for compensation, the interviewees suggested that it was not paid in a timely manner and households viewed the amounts as insufficient. From a development perspective, it may be good for future projects to develop systems to track and assist such households, if possible, in exploring alternative solutions or helping to negotiate the compensation process to mitigate the livelihood impacts of such land loss on these households.

The nature of LTA's support to the DLO meant that for any parcel a household claimed that was determined ineligible for registration, LTA's mandate of engagement at the household level ended when a claim denial was issued. Any follow up with the household was solely the DLO's responsibility. This makes practical sense, but given the history of uncompensated land dispossession and power inequities between district authorities and villagers in Tanzania, more safeguards should be worked into a future process to ensure project support to soften the landing for such households, as the impacts to their livelihoods are likely to be consequential.

In addition, the project structure and delineation of responsibility across LTA and the DLO seems to have meant that some households could have been wholly disenfranchised of their land but this may not have been visible to LTA since it were not strongly involved in the process once the claim was

passed to the DLO for a decision (other than to track whether the claim was rejected and the reason). LTA stated that its role was primarily to account for the decision that had been made. To avoid potential inadvertent disenfranchisement or perpetuating existing inequities in land rights, it is also recommended that future systematic land formalization programs consider establishing a clear grievance mechanism for households, or at least ensure the ability to identify with confidence whether any households are falling into such a state, and have a mandate to explore alternatives that may help remedy the situation.

It may also be worth considering how similar USAID-supported activities in the future may be empowered to work with DLOs or similar government counterparts to ensure follow up on issues of compensation related to land dispossession (if households are entitled to it under the law), or otherwise work with village councils and authorities to seek alternative solutions that mitigate negative impacts to households that may have been dispossessed of substantial portions of their land, even if this was legally supported.

FOR USAID, ON LEARNING FROM CUSTOMARY LAND FORMALIZATION EVALUATIONS

Revisit the role of key facilitating conditions in the customary land formalization theory of change and update expectations regarding the time that is likely to be needed to achieve downstream impacts after improved land access and tenure security have been achieved. Despite strong gains to tenure security, the IE findings suggest that in the Iringa rural context, 2-2.5 years after receipt of the formalized land document may not be enough time for smallholder customary landowners to be able to make substantial changes to their land investments, obtain productivity gains, or see a change to their economic situation as a result of land formalization alone. Particularly in the absence of supporting or embedded companion activities to strengthen smallholders' knowledge of and access to resources or other key facilitating conditions that are likely also required for them to move out of subsistence agriculture, seeing impacts to land investments, or other downstream effects from the CCRO may require a longer period to be realized at scale. Along with the above recommendations, USAID may want to consider how explicit support to improving these facilitating conditions can be embedded or coordinated with customary land formalization programs.

To enhance learning on how facilitating conditions might help customary landholders better leverage their CCRO for sustainable agricultural and economic gains, conduct targeted studies on how specific facilitating conditions and key linking issues across the land formalization and tenure strengthening theory of change affect landholders' outcomes. The IE results highlight several less-understood linkages across the envisioned theory of change from formalized land document and tenure strengthening to sustained improvement to household economic wellbeing. In addition, the IE results suggest that several facilitating conditions, such as access to credit markets, financial and business skills, and knowledge about using land as collateral, may be more necessary in some rural smallholder contexts than has previously been elaborated. To inform future program design, USAID should consider conducting targeted studies that expand on the knowledge base this IE provides. Potential focal areas include: how providing embedded agricultural extension services within targeted value chains to smallholder customary land formalization beneficiaries might affect their agricultural and economic outcomes; CCROs' role as collateral or for other purposes in informal borrowing contexts and related linkages between improved smallholder financial literacy, access to credit, and land investment; use of CCROs in communal land settings and the specific impacts of CCRO provisioning on pastoralists; and linkages between customary land formalization, women's access to credit, and economic empowerment.

Consider expanding the scope of future IEs to address questions related to village-level land use planning and governance processes, in addition to household-level effects from CCRO provisioning. This IE focused on CCRO facilitation and effects to households and did not explicitly look at the VLUP process or other aspects of land governance within villages, other than its role in enabling CCRO facilitation at the household level to move forward. While IEs must strike

a balance between breadth and depth of issues covered, and a primary focus on household-level impacts is appropriate, it is recommended that future IEs also at least somewhat examine the supporting village-level governance and land-use planning processes within which CCRO provisioning is embedded. Doing so would also enable IE teams to better examine issues of exclusion dynamics and sustainability of village-level land governance beyond receipt of CCROs, which will inevitably influence the longer-term impacts of CCRO provisioning.

To strengthen the overall knowledge base on how customary land formalization may improve livelihoods for the rural poor, under what conditions, and in what timeframes, continue to prioritize RCT approaches to evidence-based learning on customary land formalization projects. RCT approaches to evidence-based learning on land formalization continue to be rare, in part because of the additional coordination efforts required with government and implementers and (often) the need to overcome concerns and logistical feasibility associated with randomized village selection. However, the IE results also point to the enhanced learning value from such approaches, whereby even with a village sample of just 30 treatment units, which is typically too few to conduct a rigorous and sufficiently powered IE through quasi-experimental approaches, it was still possible to rigorously measure many short-term outcomes with confidence and generate strong evidence-based learning. The successful implementation of this IE in coordination with LTA and the Government of Tanzania demonstrates that it is possible to conduct cluster-based RCTs of land formalization and generate important learning benefits. To strengthen the learning value of such approaches, USAID should also work with implementers and government partners to ensure that future RCTs of systematic village-wide land formalization avoid changes to program implementation that diverge substantially from the IE design. For this IE, LTA's decision to move up its implementation schedule after the initial implementation phase was understandable from a program efficiency point of view but it introduced potential biases into the IE results because it necessitated part of the baseline data to be collected offseason. To ensure highest value for both investments in future, USAID can help facilitate strong communication and integration of program and IE planning across all stages of IE implementation.

ANNEX A: EVALUATION STATEMENT OF WORK

Impact Evaluation of the Feed the Future Tanzania Land Tenure Assistance Activity

This Statement of Work is for an impact evaluation commissioned by the United States Agency for International Development (USAID) that will examine the Feed the Future Tanzania Land Tenure Assistance (LTA) Activity.

I. Project Information

LTA is a four-year activity awarded by USAID/Tanzania to DAI in 2015 and is a part of the Feed the Future (FTF) initiative. The LTA activity seeks to clarify and document land ownership, support land use planning efforts, and increase local understanding of land use and land rights in Tanzania. It is envisioned that the interventions carried out under LTA will reduce land tenure-related risks and lay the groundwork for sustainable agricultural investment for both smallholder farmers and commercial investors throughout the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) and in the value chains of focus for Tanzania's FTF program.

The LTA activity was designed in line with the Government of Tanzania's (GOT) land tenure objectives to safeguard USAID's ongoing agricultural and economic growth investments and to protect the interests of the private sector and local communities. The activity seeks to achieve these goals by:

1. Assisting villages in completing the land use planning process and delivering Certificates of Customary Right of Occupancy (CCROs) through the use of open source mobile technology developed under USAID's Mobile Application to Secure Tenure (MAST) pilot activity;
2. Developing the capacity of village and district land governance institutions, and individual villagers, to complete the land use planning and CCRO process, effectively manage land resources, respect women's land rights, and build agriculture-related business skills through education and awareness-raising activities; and
3. Raising awareness of the MAST technology within the GOT, civil society, academia, and the private sector, with the goal of increasing uptake of the technology on a national level.

LTA is comprised of two larger activities (1 and 2) and two smaller activities (3 and 4), described below. Local sustainability is a critical component of the overall LTA activity. The goal of LTA is to empower district and village land institutions in targeted districts to carry forward the capacity development and land administration process independently (and with little or no outside financial support) once the activity concludes.

- Activity 1: Assist villages and district administrations in completing the land use planning process and delivering CCROs in select villages within two districts (Iringa and Mbeya).
- Activity 2: Educate and develop the capacity of village land governance institutions and individual villagers to complete the land use planning and CCRO process, effectively manage land resources, respect the land rights of women, youth, and pastoralists, and build agriculture-related business skills.
- Activity 3: Educate and develop the capacity of district-level land governance institutions in the Mbeya District to complete the land use planning and CCRO process; effectively manage land resources; respect the land rights of women, youth, and pastoralists; and build agriculture-related business skills.

- Activity 4: Develop capacity to use the MAST application throughout the SAGCOT and nationally.

DAI plans to implement LTA in five to six test villages over the summer of 2016. These initial villages are likely to be in Iringa District, due to Ministry preferences, but may be in Mbeya District as part of the LTA's capacity development activities. Full rollout of LTA is expected to occur in early 2017 in Iringa District, with at least 30 villages selected to receive the interventions.

2. Development Hypothesis

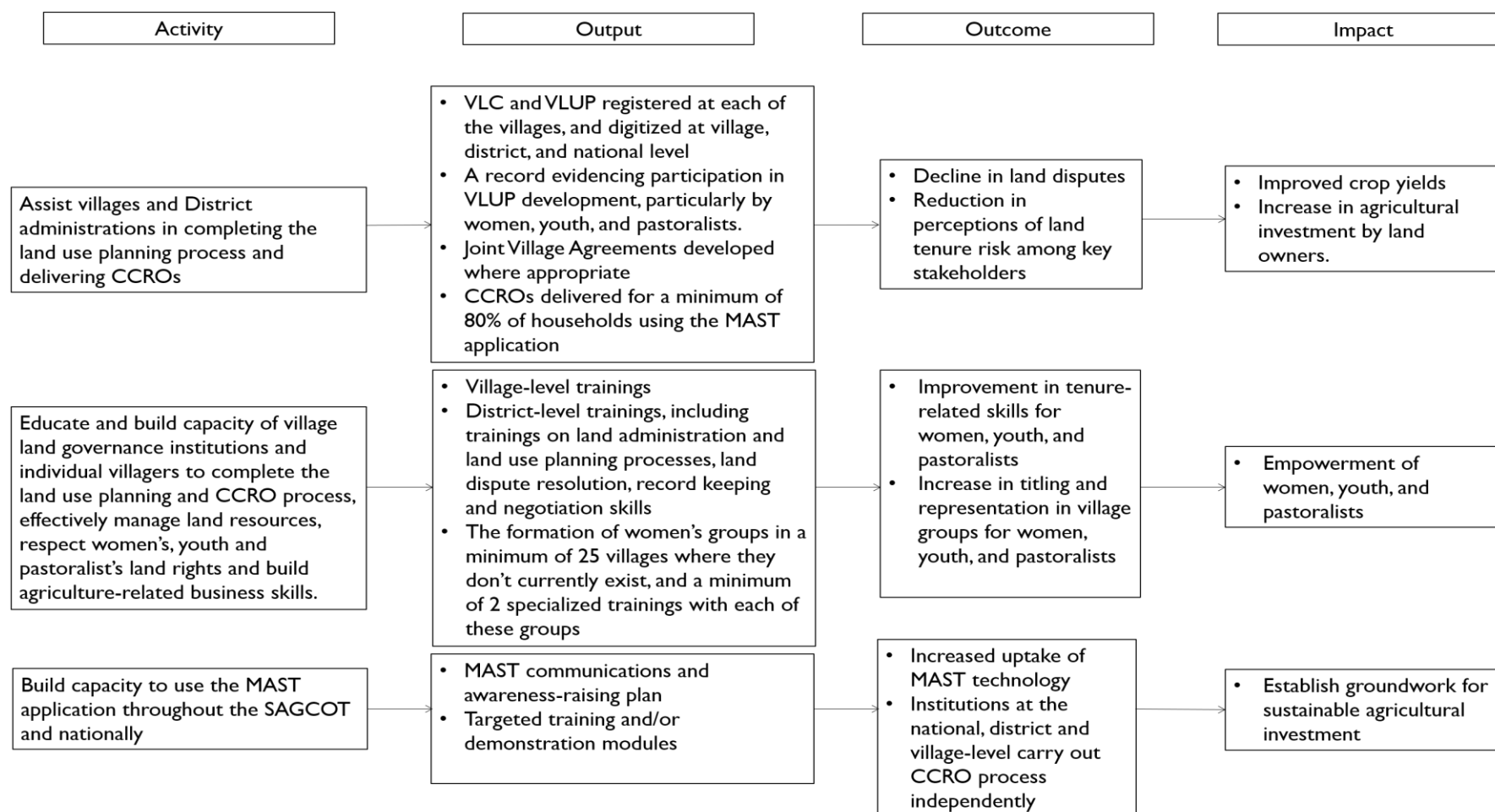
USAID envisions that if the LTA activity clarifies and documents land ownership, supports land use planning efforts, and increases local understanding of land use and land rights, then this will lead to increased agricultural investment, reduced land tenure risk, and more empowered people and local institutions. The LTA activity components work in tandem to promote inclusive agricultural development, food security and investment, and institutional capacity.

This section provides a preliminary version of the development hypotheses and causal linkages that the evaluation will consider, which will be refined and further elaborated in the Evaluation Design Proposal. Figure 1 illustrates the causal linkages that USAID envisions for translating results under each of the activities¹³⁹ into the LTA activity's intended intermediate and final outcomes and that this evaluation will be expected to examine. In this Theory of Change diagram, the proliferation of CCROs leads to increased investment and reduced disputes through improved perception of tenure security. As illustrated in the diagram, the possible hypotheses for examination within the LTA activity could include:

1. If villages and district administrations receive assistance for completing the land use planning process and delivering CCROs to formalize land rights, then disputes over land tenure will decline and crop yields will improve.
2. If village land governance institutions and individual villages are educated and trained on the land use planning and CCRO process, including on respecting the land rights of women, youth, and pastoralists, then women, youth, and pastoralists will experience an increase in titling, improvement in skills, and have better representation in their villages.
3. If the LTA activity develops capacity to use the MAST application throughout the SAGCOT and nationally, then communities and institutions at all levels will be able to sustainably certify land tenure, which will promote agricultural commercial activity and investment.

¹³⁹ Only three activities are shown in the Theory of Change diagram, since Activity 3 is specific to Mbeya District, and this evaluation will largely focus on Iringa District.

FIGURE 1: THEORY OF CHANGE FOR THE LTA ACTIVITY



3. Existing Performance Information Sources

The LTA activity is currently in its start-up phase and is developing an inception report that will outline its approach to implementation. There have been similar, albeit smaller scale, land rights interventions in Tanzania that utilize mobile technology,¹⁴⁰ but these have not been rigorously evaluated. The evaluation team has received limited documentation on the LTA activity's implementation plans to date, but USAID and DAI have committed to share all implementation reports, results frameworks, and survey materials as they become available.

USAID has already provided the evaluation team with the following documents and data related to the LTA activity:

- Scope of Work for the LTA Request for Task Order Proposals (RFTOP)
- USAID/Tanzania letter to the Ministry of Lands, Housing, and Human Settlement Development
- Iringa Village Data
- Iringa District Map with potential selection sites

The following additional documents have not yet been provided to the evaluation team but will be shared as the evaluation progresses:

- DAI proposal for LTA RFTOP
- Results framework from DAI for LTA
- All future quarterly and annual project management and progress reports prepared by DAI for LTA
- Copies or detailed descriptions of content of land tenure campaigns
- Documents pertaining to the certification, selection, and implementation of tenure projects
- Annual USAID/Tanzania LTRM Survey materials, including M&E data, sampling plans, and survey instruments

In addition to information provided by USAID and DAI, the evaluation team may need to access other types of secondary data, including administrative information on the relevant Tanzanian municipalities from a variety of sources, including Government of Tanzania (GOT) statistical agencies. The evaluation team will work with USAID and DAI as needed to obtain relevant introductions and permissions to access any such data that are needed.

4. Evaluation Purpose, Audience, and Intended Use

Purpose

The purpose of this impact evaluation is to provide USAID with an evidence base on the impacts of its investment in the LTA activity and also to build the evidence base on the impacts of land mapping, registration, and formalization in rural customary land tenure settings in Tanzania. The results of this evaluation will be made widely available to encourage replication within or beyond Tanzania, as applicable. As such, this evaluation will apply USAID's *Evaluation Policy* guidance with respect to using the most rigorous evaluation design and methods possible to demonstrate accountability for achieving results. The evaluation is also designed to capture practical lessons from USAID's experience with regard to increasing sustainable agricultural investment by securing land tenure through first-time registration.

¹⁴⁰ Mobile technology refers to MAST, which uses open source code and readily available mobile technologies (e.g., GPS/GNSS-enabled smart phones and tablets) coupled with broadly participatory crowd-sourced data collection methods.

Audience

The evaluation is aimed at several audiences. First, the findings are expected to be of value from an accountability and learning standpoint to USAID. Secondly, findings and lessons learned from this evaluation will also be of interest to the GOT, which aims to scale CCRO delivery rapidly across the country, and to DAI and other practitioners in the land tenure sector working to document customary land rights. Finally, the evaluation will be of interest to donors, implementers, and scholars more generally by making an important contribution to the evidence base on land tenure interventions.

Intended Use

This evaluation will be used to inform the design of future donor and government activities that aim to improve tenure security and generate economic benefits by strengthening land rights. One such activity is the upcoming Land Tenure Support Program, a large-scale effort jointly funded by DfID, SIDA, and DANIDA.

5. Evaluation Questions

The evaluation will address a specific set of evaluation questions that will be developed and finalized in close collaboration between USAID/E3/Land, USAID/Tanzania, the evaluation team, DAI, and other stakeholders as appropriate. This SOW will be updated following final agreement on the evaluation questions.

In general, the evaluation questions are expected to focus on the impact of the LTA activity on four types of outcomes:

1. Investment: by improving tenure security and reducing disputes, LTA is also anticipated to stimulate small-scale agricultural investment. Stronger land rights increase landholders' confidence that they will be able to reap the benefits of investments in their land that pay off over time. Such investments may include small-scale irrigation technology, soil conservation measures, or switching to perennial crops such as coffee, cashews, or fruit trees. The existing evidence on the relationship between land rights and these kinds of investments shows considerable variation in the levels and types of impacts that are observed; a summary and meta-analysis of the evidence from West Africa is provided by Fenske (2011).
2. Perceived tenure security: an important outcome associated with LTA is the extent to which beneficiaries perceive the activity as having strengthened their land rights. In practice, this means that LTA should reduce beneficiaries' concerns that their land could be expropriated, or that they could face costly disputes related to their land. Measuring the activity's impact on these kinds of perceptions requires careful attention to the context, so that survey questions can be structured around the particular issues and concerns that beneficiaries face. A number of previous impact evaluations commissioned by USAID/E3/Land have considered these issues, and the impact evaluation of LTA will draw on these experiences in developing its approach to measuring tenure security.
3. Incidence of land-related disputes or disputes: in addition to changing perceptions, another outcome that the evaluation may consider is the actual incidence of disputes and disputes over land. As above, careful attention to context is needed in designing the approach to measuring these outcomes. While reducing land dispute is an important outcome, a potential challenge with measuring impacts on dispute is that interventions such as those under LTA can actually increase the incidence of land disputes in the short run. For example, disputes may arise in the course of establishing boundaries, or latent disagreements about land rights may rise to the surface in the course of establishing formal claims. Such disputes were observed for the first MAST pilot site, with several reported cases of border disputes, intra-

family disputes over ramifications for inheritance, as well as former residents returning to try to reassert old claims when they learned that land registration was occurring. In course of finalizing the evaluation questions, the evaluation team should assess the potential for the evaluation to accurately measure these kinds of outcomes within the anticipated timeframe for the evaluation.

4. **Empowerment:** the evaluation will also consider outcomes related to empowerment. Empowerment is often considered from the standpoint of potentially vulnerable sub-groups such as women, youth, or the poor, and can also be conceptualized more generally. A World Bank study by Alsop and Heinsohn (2005) defines empowerment broadly as “as a person’s capacity to make effective choices; that is, as the capacity to transform choices into desired actions and outcomes,” and presents a framework for measuring different dimensions of empowerment. In the context of LTA, strengthening land rights is expected to act on empowerment by improving security of assets that are critical to people’s lives in the household, community, and economy.

For the impact evaluation of LTA, empowerment outcomes are of particular interest in the context of gender. A recent paper by Allendorf (2007), for example, found that land rights are closely linked to women’s empowerment in Nepal. In addition, USAID has funded the development of the Women’s Empowerment in Agriculture Index, which is widely used to measure women’s empowerment in FTF activities. The Index includes a battery of survey questions and methods to measure various dimensions of empowerment, and could be incorporated directly into the household surveys for the LTA impact evaluation.

The types of outcomes described above reflect changes in behaviors and attitudes that are expected to be measurable over a relatively short timeframe (approximately one to two years following the conclusion of implementation). LTA is also anticipated to potentially impact a broader set of economic outcomes in the longer term, as the benefits of these changes in behaviors and attitudes are realized over time. These include frequency of land transactions, access to credit, agricultural productivity, and ultimately improvements to household income, consumption, and food security. In light of the limited evidence base on the impact of land tenure interventions - particularly in a randomized controlled trial (RCT) setting – the evaluation may also examine these longer-term outcomes. One approach would be for the evaluation to include an initial round of follow-up data collection and analysis focused on the four intermediate outcomes above, with a second follow-up at a later date to measure longer term impacts. This would allow the evaluation to generate useful findings within one to two years of implementation, while still taking full advantage of the learning potential of a RCT to investigate broader economic outcomes.

6. Gender Considerations

In line with USAID’s Gender Equality and Female Empowerment Policy and Automated Directives System 203.3.1.5, the evaluation will consider gender-specific and differential effects of LTA. The evaluation team will disaggregate access and participation data by gender at multiple points along the Theory of Change diagram to analyze the potential influence these effects have on activities and outcomes. Data collected through surveys conducted under this evaluation will be gender-disaggregated to identify gender differences with respect to benefits and outcomes, as well as lessons learned from female title holders and farmers. The evaluation team will conduct further inquiry on gender themes as they emerge during data analysis.

7. Evaluation Methods

Impact Evaluation Design

Impact evaluations identify activity impact by comparing outcomes between activity beneficiaries to those of a control or comparison group of non-beneficiaries. The control or comparison group is intended to represent the counterfactual, or what would have happened in the absence of the LTA intervention. As per the USAID Evaluation Policy, impact evaluations using experimental designs – whereby units are randomly assigned to treatment and control groups – provide the most rigorous evidence of activity impact, and this will be the preferred approach for the LTA impact evaluation. Where randomized assignment is not feasible, quasi-experimental impact evaluation designs can be employed as an alternative.

The evaluation team responding to this SOW will work with USAID/E3/Land, USAID/Tanzania, and DAI staff to develop a design that suits the objectives, timing, and constraints of the LTA evaluation. The evaluation team will produce an Evaluation Design Proposal to be approved by USAID/E3/Land prior to site selection or randomization taking place. It is expected that the evaluation questions will be answered using an experimental or, if necessary, quasi-experimental design, and that a mixed-method approach may be suitable to answer the evaluation questions.

Data Collection Methods

A range of methodologies can be used in impact evaluations, and the most appropriate approach in any particular case depends on a variety of factors including the goals of the evaluation, the outcomes to be measured, the nature of the activity being examined and its implementation approach, and the resources and timeframe available for the evaluation.

USAID anticipates that data collection for this evaluation will involve the use of household-level surveys that cover all of the villages targeted for LTA. This is likely to include a baseline survey that would be conducted before major LTA interventions commence. The survey would collect information on basic demographics, household and individual characteristics, and the outcomes of interest that the evaluation will measure. The evaluation team responding to this SOW shall provide further details on data collection methods and the specific survey methodology in the Evaluation Design Proposal, including proposing specific data collection methods on a question-by-question basis.

Pending further discussion with USAID and DAI, data collection for this evaluation may also include collecting village-level information about potential activity sites that can be used to determine which villages may be eligible to participate in the activity.

8. Data Analysis Methods

In its Evaluation Design Proposal, the evaluation team responding to this SOW should propose specific data analysis methods on a question-by-question basis, including the appropriate mix of methods necessary to estimate the impact LTA has on the primary outcomes of interest. Potential data analysis methods include difference-in-difference and multivariate regressions. The Evaluation Design Proposal should also explain what statistical tests will be conducted on data collected to address all evaluation questions, how qualitative data will be analyzed, and whether that analysis will allow the evaluation team to transform some data obtained from qualitative into quantitative form.

The Evaluation Design Proposal should also indicate and justify the evaluation team's proposed sequencing of quantitative and qualitative data collection. For example, if key informant qualitative interviews are conducted during the endline data collection process, these lines of data may be collected and analyzed in parallel and only synthesized once data from all other sources are available.

9. Strengths and Limitations

The strengths and limitations of the LTA impact evaluation will depend on the final design proposed by the evaluation team in consultation with USAID and DAI. The final design should reflect a

rigorous approach to answering the evaluation questions and contribute to the global knowledge on land tenure. One key contribution of this evaluation is that it is expected to specifically test the impact of LTA on women, youth, and pastoralists, which is a great contribution to the evidence base on land tenure and investment.

Sample size, activity reach, and implementation fidelity could all create internal validity limitations for this evaluation. Ensuring that the sample size achieves sufficient statistical power will be critical for identifying impact and answering the evaluation questions. In addition, ensuring that randomization is done properly and random assignment, if applied, is systematic will improve the internal validity of the evaluation but must be done in a transparent manner. Indirect contamination across treatment arms and control groups is always a possibility, which is why it is important for the evaluation team and the implementation team to coordinate from the outset.

10. Evaluation Deliverables

It is anticipated that the evaluation team responding to this SOW will be responsible for the deliverables listed in Table 1. A final list of proposed deliverables and due dates will be included in the Evaluation Design Proposal for USAID's approval.

TABLE 1: EVALUATION DELIVERABLES

Deliverable	Estimated Due Date
1. Concept Paper, describing design and methodological options to answer the evaluation questions	TBD in consultation with USAID
2. Draft Evaluation Design Proposal	TBD in consultation with USAID
3. Final Evaluation Design Proposal, including data collection and analysis methods, evaluation instruments, team composition, and proposed timeline	TBD in consultation with USAID
4. Baseline Report	o/a 60 days following completion of baseline data collection
5. Fully cleaned, redacted, and documented baseline data submitted to Development Data Library	o/a 90 days following completion of baseline data collection
6. Draft Evaluation Report	o/a 60 days following completion of endline data collection
7. Final Evaluation Report	o/a 21 days following receipt of USAID comments on Draft Evaluation Report
8. Fully cleaned, redacted, and documented endline data submitted to Development Data Library	o/a 90 days following completion of endline data collection

All documents and reports will be provided electronically to USAID no later than the dates indicated in the approved Evaluation Design Proposal. The format of the evaluation report should follow USAID guidelines set forth in the USAID Evaluation Report Template.

11. Team Composition

The Evaluation Design Proposal should describe the specific composition and qualifications of the team members who will be carrying out this evaluation, including CVs for core team members. General qualifications and roles anticipated for the primary positions on the core evaluation team are listed below. Local survey research firm(s) with experience in the conduct of household surveys

at the village level and/or qualitative data collection may also support the evaluation team, as necessary.

Principal Investigator

The Principal Investigator for this impact evaluation will hold a Ph.D. in a relevant economic development field. S/he will have previous experience with land tenure programs and will have previously served as a team leader for one or more impact evaluation(s). Familiarity with a range of impact evaluation designs and with USAID evaluation guidance will be sought for this position. Experience in publishing evaluation research in peer-reviewed journals is desirable, as is experience working in East Africa. A demonstrated ability to gather and integrate both quantitative and qualitative findings to answer evaluation questions is expected. Demonstrated experience managing multinational teams and producing highly readable reports for USAID and its developing country partner audiences on a timely basis is expected. This individual will be primarily responsible for the quality of the evaluation design and its execution, particularly with respect to the evidence obtained on questions involving causality and the attribution of outcomes to USAID's intervention. This is not anticipated to be a full-time position.

Evaluation Specialist

The Evaluation Specialist should have a graduate degree in a relevant social science field and may be a Tanzanian national. The individual will have sufficient previous experience with evaluations and other types of studies involving sample surveys to be actively engaged in efforts to oversee and ensure the quality of multiple rounds of household surveys, that data codebooks are clearly written, and that all study data prepared by local survey research firms can be properly transferred to USAID. Gender analysis experience is also desirable. This is not anticipated to be a full-time position.

12. USAID Participation

The desirability of USAID participation in evaluation activities such as field reconnaissance will be considered in consultation with USAID and the evaluation team, and any specific roles and responsibilities of USAID staff will be described in the Evaluation Design Proposal.

13. Scheduling and Logistics

Figure 2 provides a preliminary timeframe for impact evaluation activities, which will be updated and refined by the evaluation team in its Evaluation Design Proposal. It is anticipated that implementation of LTA will occur at the start of FY17.

Figure 2: Preliminary Timeline for LTA Impact Evaluation

Tasks	FY 16		Implementation Period for LTA Project												FY 20				FY 21			
			FY 17				FY 18				FY 19											
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Concept Paper																						
Scoping Trip																						
Evaluation Design Proposal																						
Survey Pre-Test																						
Enumerator Training																						
Baseline Data Collection																						
Baseline Data Analysis and Report																						
Oral Presentation of Baseline Findings																						
LTA Program Implementation (100%)																						
Endline Data Collection and Analysis																						
Endline Report																						
Draft Final Report																						
Oral Presentation(s)																						
Final Report																						

The evaluation team will be responsible for procuring all logistical needs such as work space, transportation, printing, translation, and any other forms of communication. USAID will offer some assistance in providing introductions to partners and key stakeholders as needed, and will ensure the provision of data and supporting documents as possible.

14. Reporting Requirements

The format of the evaluation report should follow USAID guidelines set forth in the USAID Evaluation Report Template (<http://usaidlearninglab.org/library/evaluation-report-template>) and the How-To Note on Preparing Evaluation Reports (<http://usaidlearninglab.org/library/evaluation-report-template>).

The final version of the evaluation report will be submitted to USAID and it is anticipated that it will not exceed 30 pages, excluding references and annexes.

All members of the evaluation team will be provided with USAID's mandatory statement of the evaluation standards they are expected to meet, shown in the following text box, along with USAID's dispute of interest statement that they should sign before field work starts.

USAID EVALUATION POLICY, APPENDIX I

CRITERIA TO ENSURE THE QUALITY OF THE EVALUATION REPORT

- The evaluation report should represent a thoughtful, well-researched and well organized effort to objectively evaluate what worked in the project, what did not and why.
- Evaluation reports shall address all evaluation questions included in the scope of work.
- The evaluation report should include the scope of work as an annex. All modifications to the scope of work, whether in technical requirements, evaluation questions, evaluation team composition, methodology or timeline need to be agreed upon in writing by the technical officer.
- Evaluation methodology shall be explained in detail and all tools used in conducting the evaluation such as questionnaires, checklists, and discussion guides will be included in an Annex in the final report.
- Evaluation findings will assess outcomes and impact on males and females.
- Limitations to the evaluation shall be disclosed in the report, with particular attention to the limitations associated with the evaluation methodology (selection bias, recall bias, unobservable differences between comparator groups, etc.).
- Evaluation findings should be presented as analyzed facts, evidence and data and not based on anecdotes, hearsay or the compilation of people's opinions. Findings should be specific, concise and supported by strong quantitative or qualitative evidence.
- Sources of information need to be properly identified and listed in an annex.
- Recommendations need to be supported by a specific set of findings.
- Recommendations should be action-oriented, practical, and specific, with defined responsibility for the action.

15. Budget

The evaluation team responding to this SOW will propose a notional budget for this evaluation, including cost implications of the methodological options proposed. A full detailed budget will then be prepared for USAID's approval.

ANNEX B: PHASE II BASELINE SURVEY INSTRUMENT

A. Consent

Greetings! My name is _____. I am from Research Solutions Africa (RSA) and is currently undertaking a survey on behalf of MSI/NORC, a contractor with the United States Agency for International Development, in conjunction with the Iringa District Land Office to learn more about villagers in this district.

We are currently visiting villages in Iringa to gain a better understanding of village land use, administration, and the local community. The answers from this questionnaire will be used to learn more about land-use and life in the village.

I will not tell anyone about your answers to these questions. Only the research team will view your responses. Although we will ask for information about this village and your experience here, we will never use personal information in our documentation and will not report sensitive village information to anyone. This survey does not mean that a project or NGO will come to this village, and your answers will not affect whether any future projects come to this village. The entire survey will take about 2 hours.

If you have any questions in the future, you can contact MSI via phone at [redacted].

Are you willing to proceed with the interview?

1. Yes >>> **(Tick category of hhd respondent and proceed as appropriate)**
2. No >>> **(Tick respondent category and Terminate interview)**

Category of household respondent

1. Male household head >>> **Section B {Should answer the full survey, including Section M (sketch map), EXCEPT the wives section (Section L) and time use (Section LA)}**
2. Female household head >>> **Section B (should answer the full survey AND section LA AND section M, skip wives survey (section L))**
3. Head of household (for households with only one household head: widows/widowers/single parents/single-member households, etc.) >>> **Section B (should answer the full survey including section M (sketch). Section LA should also be included if respondent is female. Do not include Wives survey)**
4. **Wives** (should be given to the primary spouse of Male HH heads and implemented simultaneously to the male HH head survey) >>> **Section L and LA**

ADMINISTRATIVE INFORMATION

Household number			
Date of interview:	DD	MM	YY
Time of interview: (24 hour clock)	Start	HH	Stop
	MM		HH MM
Name of interviewer:			
Code of interviewer			
Place of interview:			
Ward			
Village			
Point of interview	1. Respondent's residence 2. In one of the household's parcel of land 3. Away from respondent's place of residence and/or parcel of land		
GPS Coordinates			
Number of visits (max. of 3)			
Reason for call back	Number of visits		
	1	2	3
Refused to be interviewed		1	1
Target respondent not at home		2	2
Target respondent requested for a call back			
No one in the household		3	3
Respondent not able to be interviewed due to medical reasons (very sick, dumb, etc.)		4	4
No adult member in the household		5	5
Language barrier		6	6
Not applicable		99	99
Outcome of final visit	Successful	Incomplete	Replaced

Field quality control checks <i>(sign as appropriate)</i>		
Activity	Activity undertaken by	
	Interviewer	Supervisor
Reviewed		
Accompanied		
Back checked		
Called back		

B. Household Roster and Information

I would like to start this interview with a few questions about each of your household members.

	Name	Question	Response options/units	Notes/instructions
		Thank you for agreeing to take this survey. To start, I would like to ask you a few questions about your household and your role as the head of the household.		
BI	Hou_role	Are you the household head?	1 Yes 2 No	
BI.1	Hou_gender	What is the respondent's gender?	1 Male 2 Female	<ul style="list-style-type: none"> If hou_role = 1 & hou_gender = 1 continue to hou_num_n and end survey at If hou_role = 1 & hou_gender = 2 continue through end of survey (all modules) If hou_role = 2 & hou_gender = 2 go to Module L (Wives Survey) If hou_role = 2 & hou_gender = 1, ask for household head, if the household head is not available

				continue to hou_num_n.
B1.2	hou_num_n	How many members constitute this household?	Enter number of household members based on hou_nme.	
B1.3	hou_nme	Can you tell me the name of all the members of this household?		RECORD THE HOUSEHOLD MEMBERS BEGINNING WITH THE HOUSEHOLD HEAD, FOLLOWED BY THE SPOUSE AND THEN THE CHILDREN STARTING WITH OLDEST FIRST AND CONCLUDING WITH THE YOUNGEST.
B2	hou_tride_n	What tribe or tribes is each member of this household from? MARK ALL THAT APPLY (Single response)	1. Hehe 2. Bena 3. Kinga 4. Pangwa 5. Maasai 990. Other(specify)	Repeat questions indexed _n for each of n household members
B3	hou_gender_n	What is [NAME]'s gender?	1= Male, 0= Female	
B4	hou_rel_n	How is [NAME] related to the head of the household/respondent?	1. HEAD 2. SPOUSE 3. SON/DAUGHTER 4. STEP SON / DAUGHTER 5. SISTER/BROTHER 6. GRANDCHILD 7. FATHER/MOTHER 8. OTHER RELATIVE (SPECIFY) 9. LIVE-IN SERVANT 990. OTHER NON-RELATIVES (SPECIFY)	
B5	hou_age_n	How old is [NAME] in completed years?		Enter age. Enter 996 for Don't Know.
B6	hou_edu_n	What is the highest grade level that [NAME] has completed?	PRIMARY	Skip if younger than 15

			P1.....11 P2.....12 P3.....13 P4.....14 P5.....15 P6.....16 P7.....17 FORM F1.....21 F2.....22 F3.....23 F4.....24 'O'+COURSE.25 F5.....31 F6.....32 'A'+COURSE.33 DIPLOMA...34 U1.....41 U2.....42 U3.....43 U4.....44 U5&+.....45	
B7	hou_rdwr_n	Can [NAME] read and write a simple sentence.	1. KISWAHILI 2. ENGLISH 3. KISWAHILI & ENGLISH 4. ANY OTHER LANGUAGE 5. NO 999.N/A (Younger than 15 years)	Skip to Hou_look_n if younger than 15 If 999 >>> Next household member OR >>> Next Section
B8		What is the marital status of [NAME]?	1. Married 2. Co-habitation 3. Divorced 4. Separated 5. Widow/er 6. Never married 990. Other (specify)	
B9	Hou_look_n	During the past 4 weeks, did [NAME] actively look for work?	1. Yes	

			2. No 996. Don't know	
B10	Hou_take_n	Was [NAME] available to start a job if he/she found one?	1. Yes 2. No 996. Don't know	If Hou_look_n = 1
B11	hou_fwrkwet_n	Did [NAME] work on the household farm, including fields and kitchen garden, during the past short and long rainy season?	1. Yes 2. No 996. Don't know	
B12	Hou_fwrkdry_n	Did [NAME] work on the household farm, including fields and kitchen garden, during the past dry season?	1. Yes 2. No 996. Don't know	
B13	Hou_status_n	Which of the following best describes the present situation of [NAME]? READ OPTIONS OUT LOUD	1. Housework / housewife 2. Student 3. Retired 4. Ill, disabled 5. Not working and not looking for work 990. Other (specify _____)	
B14	Hou_emptytype_n	In what type of economic activity did [NAME] spend most of his/her time in the last 12 months:	1. ON OWN/FAMILY FARM OR SHAMBA 2. UNPAID FAMILY HELPER (AGRIC) 3. UNPAID FAMILY HELPER (NON-AGRIC) 4. A PAID EMPLOYEE 5. SELF EMPLOYED	

C. Agricultural Organizations, Services and Training

	Name	Question	Response options/units	Notes/instructions
C1	org_proforg	Are you a member of a farmer association or cooperative?	1. Yes 2. No 3. Don't know	
C2	org_coop	Are you a member of any other kind of cooperative not related to agriculture?	1. Yes 2. No 3. Don't know	If 2 >>> C3
C2.1	org_coop_prd	What kind of cooperative? SELECT ALL THAT APPLY	1. Political party 2. Village group (non-agric) 3. Education group 4. Religious group 990. Other (specify: _____)	If org_coop = yes
C3	org_srv	Did you or anyone in your household receive any agricultural extension services in the past 12 months?	1. Yes 2. No 996. Don't know	If 2 >>> C5
C3.1	org_prd	What kind of services were provided? SELECT ALL THAT APPLY	1. Access to improved seed 2. Fertilizer, pesticides and other chemical inputs 3. Tractor services 4. Marketing services 5. Transport services 6. The opportunity to participate in a value chain scheme 7. Help to form or strengthen farmer groups 8. Contract farming 9. Post-harvest processing of ANY of crops (including drying, sorting, packaging, and/or storing) 10. Purchasing of ANY of the crops 11. Training on agricultural production and/or processing 12. Training on business practices 990. Other, SPECIFY _____	If org_srv = yes
C3.2	org_used_srv	How often has anyone in your household made use of extension services in the past 12 months?	1 3 times or more 2 Once or twice	

			3 Never	
C4	org_trnd	In the past 12 months, have you or anyone in your household received any kind of community or organizational assistance related to agriculture, such as assistance from an NGO or community group?	1. Yes 2. No 996. Don't know	If org_trnd != 1 skip to next module If 2 OR 996 >>> Next Section
C4.1	org_what	What kind of services were provided?	1. Free food/maize distribution 2. Food-for-work programme or cash-for-work programme 3. Inputs-for work programme 4. Attended a training or workshop 5. Had an agent visit my/our parcel(s) 6. Read a pamphlet 7. Other assistance (not listed above)	
C4.2	org_frequ	For how many days in the past 12 months did you or anyone in your household receive these services?	Enter days	
C5	org_name	Are you aware of these organizations working in your village? MARK ALL THAT APPLY	1. One Acre Fund 2. Briten 3. Unicef 4. Eadd 5. Cuamm 6. Clinton Foundation 7. Tahea 8. Camfed 9. Cefa 10. Wopata 11. Jica 12. TIB 13. Concern 14. Tunajali 15. SNV 16. TNRF 17. TCD 18. IMO 19. Cheet 20. Restless Development 21. LEAT 22. Caltas 23. TASAF	Select all that apply

D. Land Holdings and Characteristics

	Name	Question	Response options/units		Notes/instructions
Thank you for the earlier responses. I would now like to ask you a few questions about your land holdings and the parcels you farm.					
D1	Lan_num	How many different parcels does the household own, rent, or use?	Enter number		
D2	Lan_name	Please give each parcel a name so we can keep track during the interview			If lan_num > 1. From here down, ask for each parcel.
D3	Lan_boun	Is [PARCEL ID] inside the village boundary?	1= Yes 2 = No		
D4	Lan_cent	Is [PARCEL ID] near the village center	1= Yes 2 = No		
D5	Lan_home	Is [PARCEL ID] near your homestead your homestead?	1= Yes 2 = No		
D6	Lan_size_i	What is the size of [PARCEL ID]?	Quantity	Unit	Record local units/quantity.
D7	Lan_dist_i	How long does it take to get from your house to [PARCEL ID] on foot?			Record in minutes.
D8	Land_diffcom_i	Is [PARCEL ID] in a different village from the one you live in?	1. Yes 2. No 3. Don't know		
D9	Land_diffcomvi_i	What is the name of the village where [PARCEL ID] is?	Enter village name		If Land_diffcom_i = 1
D10	Lan_right_i	What is the ownership status of [PARCEL ID]?	1. Owned by the household 2. Used by the household free of charge 3. Rented by the household 4. Rented by the household together with other people 5. Owned by the household together with other people		If 3 OR 4 >>> D13
D11	Lan_othrent_i	Does someone else rent [PARCEL ID] from you?	1. Yes 2. No		
D12	Lan_use_i	During last year's agricultural seasons, did your household farm [PARCEL ID], leave it fallow, or use it for pasture or some other non-agricultural use?	1 Farmed this parcel 2 Left this parcel fallow 3 Used this parcel as pasture/other non-agricultural use		
D13	Lan_mth_i	What was the method by which [PARCEL ID] was	1) Bought it		Context

		acquired/claimed by your household?	2) Inherited 3) Started renting/sharecropping 4) Cleared it 5) Distributed by village 6) Received as gift 7) Occupied	
D14	Lan_yr_i	What year did your household acquire [PARCEL ID]?		Enter 996 if don't know
D15	Lan_dcd_i	Who primarily decides how to use [PARCEL ID]?	1=Self 2=Spouse 3=Both self and spouse together 4=Other male household member 5=Other female household member 990=Other, specify	
D16	Lan_svy_i	Has [PARCEL ID] ever been mapped by surveyor?	1 Yes 2 No 996 Don't know	If 2 OR 996 >>> D21
D17	Lan_yrsvy_i	What year was [PARCEL ID] mapped by surveyor?	Year	If lan_svy_i = yes 99 if unsure/don't know. Skip to next section unless land_use_i = 1 Enter 996 if don't know
D18	Lan_mnsvy_i	What month was [PARCEL ID] mapped by surveyor?	Month	Enter 996 if don't know
D19	Lan_top_i	What is the topography of [PARCEL ID]?	1 Plain 2 Valley 3 Mountain top 4 Mountain side 5 Hill 6 Other	
D20	Lan_soiltp_i	What is the primary soil type of [PARCEL ID]?	(1)Clay (2)Sandy (3)Loam (4)Other (996)Don't know	
D21	Lan_slp_i	Overall, what is the slope of [PARCEL ID]?	(1) Flat bottom (2) Flat top (3) Slightly sloped (4) Very Steep	

D22	Lan_irr_i	Is [PARCEL ID] irrigated?	1 Yes 2 No 996 Don't know	
D23	Lan_restyn_i	Have you ever left [PARCEL ID] fallow?	1 Yes 2 No	If 2, skip to lan_imp_i
D23.1	Lan_rest_i	What was the most recent year in which [PARCEL ID] was left fallow?		Enter 996 if don't know;
D23.2	Lan_restperct_i	What portion of [PARCEL ID] was left fallow?	Enter percentage	Answer only if lan_restyn_i = 1
D24	Lan_imp_i	For each of the following items I am going to ask about, I want to know if you have made any of the following improvements to this parcel, either in the past year or before that?		
D24.1	Lan_imp_well_i	<ul style="list-style-type: none"> Digging wells or pump irrigation 	1 In the past year 2 Before the past year 3 Both in the past year and before 4 No	
D24.2	Lan_imp_building_i	<ul style="list-style-type: none"> Erecting buildings 	1 In the past year 2 Before the past year 3 Both in the past year and before 4 No	
D24.3	Lan_imp_fence_i	Erecting fencing	1 In the past year 2 Before the past year 3 Both in the past year and before 4 No	
D24.4	Lan_imp_terr_i	<ul style="list-style-type: none"> Terracing 	1 In the past year 2 Before the past year 3 Both in the past year and before 4 No	
D24.5	Lan_imp_soil_i	<ul style="list-style-type: none"> Soil conservation 	1 In the past year 2 Before the past year 3 Both in the past year and before 4 No	
D25	Lan_doc_i	Do you or your household have any kind of documentation of your rights to any of your parcels?	1. Yes 2. No 996. Don't know	If Lan_doc_i != 2 OR 996 skip to Lan_use_i (D13)
D25.1	Lan_docparcel_i	Which parcels?	Record Parcel IDs	
D25.2	Lan_typedoc_i	What kind of documentation? SELECT ALL THAT APPLY.	1. GRANTED RIGHT OF OCCUPANCY 2. CERTIFICATE OF CUSTOMARY RIGHT OF OCCUPANCY (CCRO) 3. INHERITANCE LETTER	

			4. OTHER GOVERNMENT DOCUMENT 5. OTHER DOCUMENT OR LETTER (NON-GOVERNMENT/UNOFFICIAL)	
D25.3	Lan_docobtain_i	What year did you obtain the documentation for [PARCEL ID]?	Year	If land_doc_i=yes next question. 996 if unsure/don't know.
D25.4	Lan_docobtainmon_i	What month did you obtain the documentation for [PARCEL ID]?	Month	Enter 996 if unsure/don't know
D25.5	Lan_docnum_i	How many people in household have their names listed on the documentation you have for [PARCEL ID]?		Enter number; If don't know, enter 996
D25.6	Lan_docwho_i	Who in the household is listed as the primary land user on the documentation for [PARCEL ID]?	1. Self 2. Spouse 3. Jointly listed (self/spouse) 4. Other (Specify) 996. Don't know	Refer to HH roster
D25.7	Lan_docphys_i	Do you have a personal copy of the document?	1 Yes 2 No	If lan_typedoc_i == 2 (ccro) If 2 >>> D12.9
D25.8	Lan_docloc_i	Where do you store a copy of the document?	1. In homestead 2. With a nearby family member 3. At the village center 4. At the DLO/With the government	If lan_typedoc_i == 2 (ccro)
D25.9	Lan_docuse_i	Have you ever had to reference the document?	1 Yes 2 No	If lan_typedoc_i == 2 (ccro) If 2 >>> D13
D25.10	Lan_docusetype_i	Why did you reference the document?	1. To resolve a dispute 2. To obtain a loan 3. To plan inheritance 4. To prove ownership (not dispute related) 5. As part of a rental agreement 990. Other	Lan_docuse_i == yes
D26	Lan_inherp_i	Do you have an inheritance plan for your parcels?	1 Yes 2 No	If no skip to lan_svy_i

D26.1	Lan_inhe_who_i	Have you discussed this plan with anyone?	1 Yes 2 No	If not skip to lan_svy_i
D26.2	Lan_inhe_name	Who have you discussed this with?	1 Wife/Spouse 2 Children 3 Other Family 4 Village leaders 5 Other	

E. Agricultural Production

E.1 Annual Crops

	Name	Question	Response options/units	Notes/instructions
<i>Now, I am going to ask about some of the annual crops that you grow here.</i>				
E1	Ann_wet_i	Which parcels did anyone in your household cultivate during the past rainy season?	[SELECT FROM LIST OF PARCELS COLLECTED ABOVE SECTION]	996 for OTHER and specify 000 for none
E1.1	Ann_dry_i	Which parcels did anyone in your household cultivate during the past dry season?	[SELECT FROM LIST OF PARCELS COLLECTED FROM ABOVE SECTION]	996 for OTHER (specify) 000 for none
E1.2	Ann_difcrop_i	How many different crops did you grow on [PLOT ID]?	Enter number	
E1.3	Ann_croprain_i	What crops were grown on [PLOT ID] during the past rainy season?		See crop codes at the end of this document.
E1.4	Ann_cropdry_i	What crops were grown on [PLOT ID] during last year's dry season?		See crop codes
E1.5	Ann_perc_i	What percentage of [PLOT ID] is used to grow [CROP]?		
E1.6	Ann_soil_i	What did you use to till the soil on [PLOT ID]? (Select all that apply)	1 Hand hoe 2 Animal-drawn plows 3 Tractors or other machinery 990 OTHER, specify	
E1.7	Ann_seed_i	What was the name of the main seed variety for this [CROP] on [PLOT ID]?		Enter name
E1.8	Ann_varseed_i	How many varieties of seed for this [CROP] were planted on [PLOT ID]?		Enter number
E1.9	Ann_seed_quant_i	What was the total amount of seeds used on [PLOT ID]?	Enter number	
E1.9.1	Ann_seedamo_i	What units were used for ann_seed_qaunt_i ?	1. KG 2. 1 LITER CUP 3. 10 LITER BUCKET 4. 20 LITER BUCKET 5. SMALL CUP (handful) 6. OTHER, SPECIFY	
E1.10	Ann_seedcert_i	Did you receive a voucher/certificate for any of this [SEED]?		
E1.11	Ann_numseed_i	What was the total amount paid for seeds (Tsh)?		
E1.12	Ann_intype_i	What type of input did you utilize during [season] on [PLOT ID] SELECT MULTIPLE	1. Fertilizer 2. Pesticide 3. Herbicide 4. Fungicide	

	Name	Question	Response options/units		Notes/instructions
			5. Other 6. None		
EI.13	Ann_fert_i	What type of fertilizer did you use on [PLOT ID]?	1. Di-ammoium Phosphate (DAP) 2. UREA 3. Triple Super Phosphate (TSP) 4. Calcium Ammonium Nitrate (CAN) 5. Sulphate of Ammonium (SA) 6. Nitrogen Phosphate Potassium (NPK) 7. Minjingu Rock Phosphate (MRP) 8. Organic Fertilizer 9. Other 10. 999 N/A		Answer if EI.122 ==1 This should only show up if ann_intype_i includes Fertilizer
EI.14	Ann_inputkg_i	In total, what quantity of [INPUT] was used for your crops during [season] on all parcels?	Quantity	Units: 1. KG 2. 1 LITER CUP 3. 10 LITER BUCKET 4. 20 LITER BUCKET 5. SMALL CUP (handful) 6. OTHER, SPECIFY	For overall plots.
EI.15	Ann_inputcost_i	In total, how much did you pay for the [INPUT] during [season]?	TZ shillings		
EI.16	Ann_rent_i	In the [season] did you rent farm equipment (tractors, combine, plough, bullock etc)?	1 Yes 2 No		If 2 >>> EI.18
EI.17	Ann_rentpay_i	In total, how much did you pay for the rented farm equipment during [season]?	TZ shillings		
EI.18	Ann_irr_i	In [season], did your household spend money on irrigation (including electricity, diesel, pumpset rental, maintenance, repair of irrigation channels etc.) for all/any crops?	1 Yes 2 No		If 2 >>> EI.20

	Name	Question	Response options/units	Notes/instructions
EI.19	Ann_irrcost_i	In total, how much did you spend on irrigation during [season]?	TZ shillings	
EI.20	Ann_labyn_i	Did you use hired labor during [season]?	1 Yes 2 No	
EI.20.1	Ann_labor_i	In total, how much did you spend on hired farm labor during [season]?	TZ shillings	
EI.21	Ann_laborday_i	Beyond the household labor and other hired labor already discussed, approximately how many days of shared/cooperative/community labor were used in total for all crops during [season]?		Days would be full working days, i.e. during day light hours.
EI.22	Ann_harv_i	During [season] how much [CROP] did your household harvest in total across all plots of land?	Record _quantity :	
EI.22.1	Ann_harv_i	What units were used to record harvest for ann_harv_i?	1. KG 2. Large Bag (100 KG) 3. Small Bag (50 KG) 4. 20 Liter Bucket 5. 10 Liter Bucket 6. Crate 7. Other (Specify)	if KG used, skip to Ann_cons_i
EI.23	Ann_consquant_i	What quantity of the [CROP] harvested during [season] has been consumed by members of your household?	Enter quantity	
EI.23.1	Ann_consunit_i	What units were used to record ann_conskg_i	1. KG 2. Large Bag (100 KG) 3. Small Bag (50 KG) 4. 20 Liter Bucket 5. 10 Liter Bucket 6. Crate 7. Other (Specify)	
EI.24	Ann_soldquant_i	What quantity of [CROP] harvested during [season] was sold at the marketplace (to any outlet)?	Enter quantity	
EI.24.1	Ann_sold_i	What units were used to record ann_soldquant_i?	1. KG 2. Large Bag (100 KG) 3. Small Bag (50 KG) 4. 20 Liter Bucket 5. 10 Liter Bucket 6. Crate 7. Cart 8. Other (Specify)	
EI.25	Ann_earn_i	How much did you receive in total for [CROP] sold at the	TZ Shillings	

	Name	Question	Response options/units	Notes/instructions
		marketplace (to an agribusiness center or any other outlet)?		
E1.26	Ann_earn_all	How much did you receive in total from annual crop farm earnings in the last 12 months?	TZ shillings	

E.2 Perennial Crops

	Name	Question	Response options/units	Notes/instructions
		Thank you. Now, I want to ask you about perennial crops that you grow.		
E2.1	Pere_crop_num	How many fruit trees and permanent crops do you grow on [PLOT ID]?	Enter number	
E2.1.1	Pere_crops	Please tell me all of the fruit trees and permanent crops that you grow on [PLOT ID]		Ask respondent to select from list of fruit and perennial crops. These questions are asked for each fruit and permanent crop.
E2.1.2	Pere_cropcount	How many of these plants/trees are on [PLOT ID]?		Type=Fruit or Permanent Crop
E2.1.3	Pere_yearplant	When were most of these [CROP] planted on [PLOT ID]?	Month/Year	
E2.1.4	Pere_plants	How many trees/plants were planted on [PLOT ID] during the last 12 months?	#	
E2.5	Pere_trees	In the past 12 months, how many non-fruit trees did you plant on any of your plots?	#	
E2.5.1	Pere_treeuse	What do you plan to use these trees for?	1. Wood 2. Timber/Lumber 3. Erosion control 4. Border demarcation 990.Other	If Pere_trees is not 0, if Other record response
E2.6	Pere_intercrop	Was cultivation intercropped during the past long rainy season?	1 Yes 2 No	Skip to pere_prod_i if No
E2.6.1	Pere_interseason	What was the reason for intercropping?	1 More fertile for the soil 2 Substitute if either crop fails 3 To get the most out of my land 4 Other	
E2.7	Pere_prod_i	What was the last harvest for the [CROP]?	Month/year	
E2.8	Pere_dec_i	Who in the household made the decisions concerning the use of [CROP] harvested in the past 12 months?	Select from list	
E2.9	Pere_amount_i	What was the total amount of [CROP] harvested in the past 12 months?	Enter quantity	
E2.9.1	Pere_amountunit_i	What units were used to record the amount in pere_amount_i?	1. KG	

	Name	Question	Response options/units	Notes/instructions
			2. Large Bag (100 KG) 3. Small Bag (50 KG) 4. 20 Liter Bucket 5. 10 Liter Bucket 6. Crate 7. Other (Specify)	
E2.10	Pere_sell_i	Did you sell any of the [CROP] collected?	1 Yes 2 No	If 2 >>> Next Section.
E2.10.1	Pere_quant_i	What was the total quantity sold?	Enter quantity	
E2.10.12	Pere_quantunit_i	What units were used to record the amount in pere_quant_i	1. KG 2. Large Bag (100 KG) 3. Small Bag (50 KG) 4. 20 Liter Bucket 5. 10 Liter Bucket 6. Crate 990. Other (Specify)	
E2.10.2	Pere_value_i	What was the total value of [CROP] sold?	TZ Shillings	
E2.10.3	Pere_nego_i	Who in your household was responsible for negotiating the sale of the [CROP]?	Answer type/code	
E2.10.4	Pere_earnuse_i	Who in your household decided what to do with these earnings?	Answer type/code	
E2.10.5	Pere_locsell_i	Where did you sell most of the [CROP]?	Select all that apply: 1 purchased wholesale by a middleman 2 purchased wholesale by a processor 3 sold in the market directly 4 sold to a neighbor 5 Other	
E2.10.6	Pere_inc_i	How much did you receive in total from perennial and fruit crop farm earnings in the last 12 months?	TZ shillings	

Crops Codes

Cereals/tubers/roots: Maize.....11 Paddy.....12 Sorghum.....13 Bulrush Millet...14 Finger Millet...15 Wheat.....16 Barley.....17 Cassava.....21 Sweet Potatoes...22 Irish potatoes...23 Yams.....24 Cocoyams.....25 Onions.....26 Ginger.....27 Legumes, Oil & fruit: Beans.....31 Cowpeas.....32 Green gram.....33 Chick peas.....35 Bambara nuts.....36 Field peas.....37 Sunflower.....41 Sesame.....42 Groundnut.....43 Soyabeans.....47 Caster seed.....48	Fruits: Passion Fruit....70 Banana.....71 Avocado.....72 Mango.....73 Papaw.....74 Orange.....76 Grapefruit.....77 Grapes.....78 Mandarin.....79 Guava.....80 Plums.....81 Apples.....82 Pears.....83 Peaches.....84 Lime.....851 Lemon.....852 Pomelo.....68 Jack fruit.....69 Durian.....97 Bilimbi.....98 Rambutan.....99 Bread fruit.....67 Malay apple.....38 Star fruit.....39 Custard Apple....200 God Fruit.....201 Mitobo.....202 Plum.....203 Peaches.....204 Pomegranate.....205 Date.....210 Tungamaa.....211 Vanilla.....212	Vegetables: Cabbage.....86 Tomatoes.....87 Spinach.....88 Carrot.....89 Chilies.....90 Amaranths.....91 Pumpkins.....92 Cucumber.....93 Egg Plant.....94 Water Mellon.....95 Cauliflower.....96 Okra.....100 Fiwi.....101	Cash Crops: Cotton.....50 Tobacco.....51 Pyrethrum.....52 Jute.....62 Seaweed.....19	Permanent Cash crops: Sisal.....53 Coffee.....54 Tea.....55 Cocoa.....56 Rubber.....57 Wattle.....58 Kapok.....59 sugar Cane.....60 Cardamom61 Tamarind.....63 Cinnamon.....64 Nutmeg.....65 Clove.....66 Black Pepper....18 Pigeon pea.....34 Cassava.....21 Pineapple.....75 Palm Oil.....44 Coconut.....45 Cashew nut.....46 Green Tomato.....300 Monkeybread.....301 Bamboo.....302 Firewood/fodder..303 Timber.....304 Medicinal plant..305 "Fence tree".....306 other.....990
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F. Perceptions of land rights

	Name	Question	Response options/units	Notes/instructions
		Ok. I would like to ask you about some issues around land in this village. I only want to talk about parcels here (in this village), not things you may have heard in nearby villages (or plots you may have elsewhere).		Leave out mention of parcels in other villages if it is not relevant.
F1	Per_takepos	In the next five years, do you think it's possible that someone could try to take one of your parcels from you without your permission?	1 Yes 2 No 996 Don't know	If 2 OR 996 >>> F6
F2	Per_expro	How likely do think it is that someone would try to take one of your parcels from you in the next 5 years?	1 Possible but unlikely 2 Somewhat likely 3 Very likely/it is happening now	If per_takepos = yes
F3	Per_parcel_i	Which parcels do you feel are at risk?	Run through list of parcels	If per_expro != 1
F4	Per_source_i	Who do you think would try to take your parcels?	1. Government 2. Foreign investor 3. Tanzanian investor (from outside the village) 4. Someone inside the village 5. Absentee owner/land claimants 6. Extended family 7. Other	If per_expro != 1
F5	Per_reason	Which if any of the following are reasons why you think this could happen? Please rank from the most important reason to the least important reason 1. Ongoing or past disputes or expropriation 2. Lack of documents 3. Length of agreement (if lease agreement for example) 4. Problems experienced by others in the community	Enter rank order. If one or more options are not relevant, ask for top rank and then determine which seem the least irrelevant of the irrelevant options and work from there.	If per_takepos = yes
F6	Per_changepos	Compared to one year ago, do you think the possibility that someone could try to take one of your parcels has increased, decreased, or stayed the same?	1 Increased 2 Decreased 3 Stayed the same	
F7	Per_comworry	In general, how many people in your community are worried that someone might try to take their land against their will?	1 None or very few 2 Some are worried but most are not 3 Most are worried but not all 4 All or nearly all are worried	
F8	Per_borpos	Do you think it's possible that you could have a dispute over the	1 Yes	If 2 >>> F10

		borders of one of your parcels with a neighbor in the next 5 years?	2 No	
F9	Per_disputeprob	How likely do think it is that you could have a dispute over the borders of one of your parcels with a neighbor in the next 5 years?	1 Possible, but unlikely 2 Somewhat likely 3 Very likely/it is happening now	If per_borpos = yes
F10	Per_reasonwhy	Which if any of the following are reasons why you don't think this is possible? <ul style="list-style-type: none"> • My family has owned/used the parcel for a long time • Lack of problems in the past • Land has been surveyed • HH has documentation of rights • Village Council/Elders/Leaders can easily address potential disputes 	Select all that apply.	If per_takepos = no
F11	Per_dispute_change	Compared to one year ago, do you think the possibility that you could have a boundary dispute with your neighbors has increased, decreased, or stayed the same?	1 Increased 2 Decreased 3 Stayed the same	
F12	Per_dispute_type_i	Over the past 5 years, how big of a problem have each of the following types of disputes about land been in your community? <ul style="list-style-type: none"> • Family disputes • Disputes with investors • Disputes with others (non-family) claiming land • Boundary disputes between neighbors • Disputes about land rentals/sharecropping agreements • Disputes over grazing 	1 Not a problem at all 2 A small problem 3 A big problem	Ask for each kind of dispute
F13	Per_prob_change	Over the past year, would you say problems with land disputes have improved, stayed the same, or gotten worse?	1 Improved 2 Stayed the same 3 Gotten worse	
F14	Per_future	In the next 12 months, do you expect problems with land disputes will improve, stay the same, or get worse?	1 Improved 2 Stayed the same 3 Gotten worse	
F15	Per_coma	Do you use communal pasture land?	1 Yes 2 No	If 2 >>> F17
F16	Per_coml	Do you think it is possible that you will lose your existing rights on communal pasture land in the next 12 months?	1 Yes 2 No 996 Don't know	Answer if per_coma=Yes If 2 OR 996 >>> F17
F16.1	Per_coml_why	How likely do you think it is that you would lose your existing rights on communal pasture land in the next 12 months	1 Highly likely 2 Somewhat likely 3 Possible but unlikely	If per_coml = Yes
F16.2	Per_comr	Why do you think you will lose your existing rights on communal pasture land in the future?	1= Local farmers encroaching onto communal land or access routes. 2= Village will decide to	Answer if per_coml=Yes

			allocate the land for other uses. 3= The government will allocate the communal land to an investor 990= Other (please specify)	
F17	Per_fallow	How much of a risk is there that someone will take over one of your plots if you leave it fallow?	1 Very high risk 2 Somewhat risky 3 No risk 4 Unsure	
F18	Per_inheritforce	In general, do you feel that your plans for land inheritance will be enforced?	1 Yes 2 No 996 Don't know/unsure	
F19	Per_landlaw	How well do you understand the official land laws?	1 Very well 2 Familiar but don't know the details 3 Familiar with some rules but don't know if they are official law 4 Unsure	
F20	Per_CCRO	Have you heard of CCROs?	1 Yes 2 No	If 2 >>>Per_LTA. DO NOT PROMPT IF RESPONDENT HAS NOT HEARD OF CCROs.
F20.1	Per_payCCRO	In general, how much (if anything) would you be willing to pay to have one of your parcels surveyed and to receive a CCRO?		
F21	Per_LTA	Have you heard of LTA?	1 Yes 2 No	If 2 >>> Next section. DO NOT PROMPT IF RESPONDENT HAS NOT HEAR OF LTA!
F21.1	Per_LTAvisit	Did LTA visit your parcel in the past 2 years?	1 Yes 2 No	If 2 >>> Next section
F21.2	Per_LTArec	Which of the following did you receive through LTA? MARK ALL THAT APPLY	<ul style="list-style-type: none"> Land was surveyed/ mapped CCRO Notarized title None of the above 	If Per_LTAvisit= yes
F21.3	Per_LTAinfo	Before the LTA process began, did you receive any information about what was going to happen?	1 Yes 2 No	If Per_LTAvisit = yes
F21.4	Per_LTAinfotype	What kind of information? Select all that apply	<ul style="list-style-type: none"> community meetings with VEO community meetings with LTA 	Based on Per_LTArec

			<ul style="list-style-type: none"> • individually consulted by VEO • Individually consulted by LTA • Other 	
F21.5	Per_LTAuff	Did you feel this information was sufficient for you to understand what was happening and how you could obtain your CCRO?	1 Yes 2 No	
F21.6	Per_LTAmap	Were you present when your parcels were being mapped?	1 Yes 2 No	If per_LTAvisit = yes If 2 >>> F21.8
F21.7	Per_LTAmappres	Would you have like to have been present when your parcels were being mapped?	1 Yes 1. 2 No	If Per_LTAprob = yes
F21.8	Per_LTAverify	During the verification process, did you feel you were adequately informed about who was claiming rights to what parcel?	1 Yes 2 No	If per_LTArec = CCRO
F21.9	Per_LTAverifypeople	During the verification process, do you think there were there other people in the village who felt that they were not adequately informed about who was claiming what parcel?	1 Yes 2 No	If Per_LTA = yes
F21.10	Per_LTAtime	When did LTA visit your parcel?	Month/Year	
F21.11	Per_LTAmap	When did [Per_LTArec response] take place?	<ul style="list-style-type: none"> • Month/Year 	If per_docyben = yes

G. Land disputes

	Name	Question	Response options/units	Notes/instructions
<i>This next line of questioning addresses disputes around land in the village. As a reminder, we are not going to share your responses with anyone else in the village or to anyone in the government. Your responses will not affect whether this village receives services or not. We just want to learn more about disputes here.</i>				
G1	Dis_dis	In the past year, has anyone in your household been involved in any dispute or argument about land- for example, about who owns or has rights to a parcel, boundaries of parcels, or inheritance of land?	1 Yes 2 No	If 2 >>> Next section
G1.1	Dis_disnum	How many disputes?	#	
G1.2	Dis_mem_j	Which household member had [DISPUTE ID]? SELECT ALL RELEVANT HH MEMBERS.	All hh members > 15, include “the whole household” as an option	Repeat questions indexed _j for each of j disputes
G1.3	Dis_own_j	Does the household currently use the parcel over which [DISPUTE ID] occurred?	1 Yes 2 No	
G1.4	Dis_nme_j	What is the name of the parcel on which [DISPUTE ID] occurred? SELECT ALL THAT APPLY.	Parcel names from section D	If yes to previous
G1.5	Dis_type_j	What was [DISPUTE ID] related to? Select all that apply.	1 Land that the household owned or was using 2 The household trying to acquire new land 3 Land rented from the household 4 Land rented by the household 5 Inheritance 6 Grazing 7 Other	If 1 >>> G1.6 2 >>> G1.7 3 >>> G1.8 4 >>> G1.9 5 >>> G1.10 6 >>> G1.11
G1.6	Dis_desc1_j	Which of the following best describes [DISPUTE ID]?	1 Someone who lives in the area tried to take the household's land 2 Someone from outside the area tried to take the household's land 3 Boundary dispute with neighbor 4 Government tried to take the land or stop the household from using it	If dis_type_j = 1
G1.7	Dis_desc2_j	Which of the following best describes [DISPUTE ID]?	1 The household bought/claimed/requested some new land, but someone else claimed to be the owner 2 The household did not buy the land but wanted land that someone else was using	If dis_type_j = 2

			3 None of the above	
G1.8	Dis_desc3_j	Which of the following best describes [DISPUTE ID]?	1 Payment of rent/crops 2 Length of rental agreement 3 Renter tried to claim ownership 4 Other	If dis_type_j = 3
G1.9	Dis_desc4_j	Which of the following best describes [DISPUTE ID]?	1 Payment of rent/crops 2 Length of rental agreement 3 Disagreement over ownership 4 Other	If dis_type_j = 4
G1.10	Dis_desc5_j	Which of the following best describes [DISPUTE ID]?	1 Disagreement with brothers/sisters over parents' land 2 Widow/widower whose land is being claimed by spouse's relatives 3 Other	If dis_type_j = 5 Need to tailor this one
G1.11	Dis_desc6_j	Which of the following best describes [DISPUTE ID]?	1 Disagreement with pastoralists over grazing on land 2 Disagreement with non-pastoralists from the village over grazing on land 3 Disagreement with non-pastoralists from outside the village over grazing on land 3 Other	If dis_type_i=6
G2	Dis_desc7_i	Describe [DISPUTE ID]	Write response	If dis_type_i = 7
G3	Dis_yr_j	In what year did [DISPUTE ID] begin?		
G4		How long did [DISPUTE ID] last?	Months	
G5	Dis_serious_j	Overall, how serious was [DISPUTE ID]?	1 Very serious 2 Somewhat serious 3 Not serious	Guidance: "serious" here means that it disrupted or altered normal life activities.
G6	Dis_mny_j	Did you lose money because of [DISPUTE ID]?	1 Yes, a little (less than TZS 10,000) 2 Yes, a lot (more than TZS 10,000) 3 No	
G7	Dis_safe_j	Did [DISPUTE ID] make you worried about your safety?	1 Yes, a lot 2 Yes, a little 3 No	
G8	Dis_resolved_j	Was [DISPUTE ID] resolved?	1 Yes 2 No	If 2 >>> G9
G8.1	Dis_who_resolved_j	Who resolved [DISPUTE ID]?	1 We resolved it amongst ourselves 2 Others in the	If yes to dis_resolved_j Need

			community 3 The Village Council 4 District Courts 6 District Officials 7 Village land use committee 8 Ward land use committee 9 Other	to tailor
G8.2	Dis_satis_j	How satisfied were you with how [DISPUTE ID] was resolved?	1 Very satisfied 2 Somewhat satisfied 3 Not satisfied	If yes to dis_resolved_j
G9		How likely is it that you will have another dispute like [DISPUTE ID]?	1 Very likely 2 Somewhat likely 3 Not likely 4 Unsure	

H. Non-Agricultural Income, Consumption, and Assets

	Name	Question	Response options/units	Notes/instructions
H1	Inc_own	Does your household currently own any of the following items in good working condition: [READ EACH OPTION OUT LOUD AND MARK IF ANSWER "YES" or ' NO'		
H1.1	Inc_own_radio	<ul style="list-style-type: none"> Radio or Radio Cassette 	1 Yes 2 No	
H1.2	Inc_own_mobile	<ul style="list-style-type: none"> Telephone(mobile) 	1 Yes 2 No	
H1.3	Inc_own_sewm	<ul style="list-style-type: none"> Sewing Machine 	1 Yes 2 No	
H1.4	Inc_own_tv	<ul style="list-style-type: none"> Television 	1 Yes 2 No	
H1.5	Inc_own_dvd	<ul style="list-style-type: none"> Video / DVD 	1 Yes 2 No	
H1.6	Inc_own_lanterns	<ul style="list-style-type: none"> Lanterns 	1 Yes 2 No	
H1.7	Inc_own_otherstove	<ul style="list-style-type: none"> Stove 	1 Yes 2 No	
H1.8	Inc_own_bicycle	<ul style="list-style-type: none"> Bicycle 	1 Yes 2 No	
H1.9	Inc_own_watches	<ul style="list-style-type: none"> Watches 	1 Yes 2 No	
H1.10	Inc_own_mnets	<ul style="list-style-type: none"> Mosquito net 	1 Yes 2 No	
H1.11	Inc_own_iron	<ul style="list-style-type: none"> Iron (Charcoal or electric) 	1 Yes 2 No	
H1.12	Inc_own_fanair	<ul style="list-style-type: none"> Fan/Air conditioner 	1 Yes	

			2 No	
H1.13	Inc_own_fields	<ul style="list-style-type: none"> Fields/Land 	1 Yes 2 No	
H1.14	Inc_own_solar	<ul style="list-style-type: none"> Solar panel 	1 Yes 2 No	
H1.15	Inc_own_house	<ul style="list-style-type: none"> Houses/housing addition 	1 Yes 2 No	
H1.16	Inc_own_poultry	<ul style="list-style-type: none"> Poultry 	1 Yes 2 No	
H1.17	Inc_own_livestock	<ul style="list-style-type: none"> Livestock 	1 Yes 2 No	
H1.18	Inc_own_other	<ul style="list-style-type: none"> Other 	1 Yes 2 No	
H1.11	Inc_own_radio_num	<ul style="list-style-type: none"> Radio or Radio Cassette 	Quantity	If Inc_own_radio = yes
H1.21	Inc_own_mobile_num	<ul style="list-style-type: none"> Telephone(mobile) 	Quantity	If inc_own_mobile = yes
H1.31	Inc_own_sewm_num	<ul style="list-style-type: none"> Sewing Machine 	Quantity	If own_sewm_num = yes
H1.41	Inc_own_tv_num	<ul style="list-style-type: none"> Television 	Quantity	If inc_own_tv = yes
H1.51	Inc_own_dvd_num	<ul style="list-style-type: none"> Video / DVD 	Quantity	If inc_own_dvd = yes
H1.61	Inc_own_lanterns_num	<ul style="list-style-type: none"> Lanterns 	Quantity	If inc_own_lanterns=yes
H1.71	Inc_own_stove_num	<ul style="list-style-type: none"> Stove 	Quantity	If inc_own_stove = yes
H1.81	Inc_own_bicycle_num	<ul style="list-style-type: none"> Bicycle 	Quantity	If inc_own_bicycle = yes
H1.91	Inc_own_watches_num	<ul style="list-style-type: none"> Watches 	Quantity	If inc_own_watches = yes
H1.101	Inc_own_mnets_num	<ul style="list-style-type: none"> Mosquito net 	Quantity	If inc_own_mnets = yes
H1.111	Inc_own_iron_num	<ul style="list-style-type: none"> Iron (Charcoal or electric) 	Quantity	If inc_own_iron = yes
H1.121	Inc_own_fanair_num	<ul style="list-style-type: none"> Fan/Air conditioner 	Quantity	If inc_own_fanair = yes
H1.131	Inc_own_fields_num	<ul style="list-style-type: none"> Fields/Land 	Quantity	If inc_own_fields = yes
H1.141	Inc_own_solar_num	<ul style="list-style-type: none"> Solar panel 	Quantity	If inc_own_solar = yes
H1.151	Inc_own_house_num	<ul style="list-style-type: none"> Houses/housing addition 	Quantity	If inc_own_house =

				yes
H1.161	Inc_own_poultry_num	<ul style="list-style-type: none"> Poultry 	Quantity	If inc_own_poultry = yes
H1.171	Inc_own_livestock_num	<ul style="list-style-type: none"> Livestock 	Quantity	If inc_own_livestock = yes
H1.181		<ul style="list-style-type: none"> Solar lamp 	Quantity	If inc_own_solar lamp = yes
H1.191	Inc_own_other_num	<ul style="list-style-type: none"> Other 	Quantity by specified item	If inc_own_other = yes
H2	Inc_own_ani	Which of the following animals are owned by the household?	1. Cows, oxens and bulls 2. Horses, donkeys and mules 3. Pigs 4. Goats 5. Sheep 6. Poultry 7. Other 8. None	
H3	Inc_hwalls	What is the major construction material of the walls of the main dwelling?	1. POLES (INCLUDING BAMBOO), BRANCHES, GRASS) 2. POLES AND MUD/MUD AND STONES 3. MUD ONLY 4. MUD BRICKS 5. BAKED/BURNT BRICKS 6. CONCRETE, CEMENT, STONES 990. OTHER, SPECIFY	Enumerator should directly observe to confirm response.
H4	Inc_hroof	What is the major construction material of the main roof?	1. GRASS, LEAVES, BAMBOO 2. MUD AND GRASS 3. CONCRETE, CEMENT 4. METAL SHEETS (GCI) 5. ASBESTOS SHEETS 6. TILES 7. OTHER, SPECIFY	
H5	Inc_act_n	Other than working on the household plots, did [NAME] do anything else to earn money including work for pay, work in business for (him/herself),	1 Yes 2 No	Ask for each hh member older than 15

		work in a family business, making things to sell, casual labor, odd jobs, or any other activity to earn money, during the last 12 months?		If 2 >>> H6
H5.1	Inc_jobtype_n	In this work, was [NAME] working for:	1. Work for non-household member/ firm/ company 2. "non-farm on own account/ household enterprise" 3. Farm owned or rented by household member	If Inc_act_n== Yes
H5.2	Inc_occtype_n	What activity did [NAME] do?	1. FISHING 2. MINING 3. TOURISM 4. GOVERNMENT OFFICE 5. PARASTATAL 6. PRIVATE SECTOR 7. NGO / RELIGIOUS 8. SELF-EMPLOYED (NOT AGRICULTURE): WITH EMPLOYEES 9. SELF-EMPLOYED (NOT AGRICULTURE): W/OUT EMPLOYEES 10. UNPAID HOUSEHOLD LABOUR	
H5.3	Inc_months	During the last 12 months, for how many months did [NAME] work in their job?	Enter months	
H5.4	Inc_hours	During the last 12 months, how many hours did [NAME] usually work in this job each day?	Enter hours	
H5.5	Inc_paid	Was [NAME] being paid in this job?	1 Yes 2 No	
H5.5.1	Inc_period_n	How much was [NAME] being paid?	<div>Amount (TZS)</div> <div>Period of payment</div> <div>1 Month 2 Fortnight 3 Week 4 Day 5 Other</div>	

H6	Inc_inc	For each of the following, can you tell me if anyone in your household earned income from this source in the past 12 months? READ EACH OPTION OUT LOUD AND MARK IF ANSWER IS “YES”	1 Yes 2 No	
H6.1	Inc_inc_wage	<ul style="list-style-type: none"> Wage and/or self-employment income 	1 Yes 2 No	
H6.2	Inc_inc_rent	<ul style="list-style-type: none"> Rental of land / property 	1 Yes 2 No	
H6.3	Inc_inc equip	<ul style="list-style-type: none"> Rental of farm equipment / animals 	1 Yes 2 No	
H6.4	Inc_inc_saleanim	<ul style="list-style-type: none"> Sale of livestock 	1 Yes 2 No	
H6.5	Inc_inc_animprod	<ul style="list-style-type: none"> Revenue from livestock products 	1 Yes 2 No	
H6.6	Inc_inc_asset	<ul style="list-style-type: none"> Sale of household assets 	1 Yes 2 No	
H6.7	Inc_inc_remit	<ul style="list-style-type: none"> Remittances from family outside the household, friends or others 	1 Yes 2 No	
H6.8	Inc_inc_ssnit	<ul style="list-style-type: none"> Social Security National Insurance Trust, or SSNIT 	1 Yes 2 No	
H6.9	Inc_inc_pension	<ul style="list-style-type: none"> Private pensions or other retirement payments 	1 Yes 2 No	
H6.10	Inc_inc_govt	<ul style="list-style-type: none"> Social assistance payments from the government (i.e., scholarships, disability payments, etc.) 	1 Yes 2 No	
H6.11	Inc_inc_ngo	<ul style="list-style-type: none"> Social assistance from aid programs, churches, NGOs, or other organizations 	1 Yes 2 No	
H7	Inc_earn	For each of the following YES responses in H6, can you tell me how much anyone in your household earned from this source?	Amount in TZS	
H7.1	Inc_earn_wage	<ul style="list-style-type: none"> Wage and/or self-employment income 		If H6.1 == 1
H7.2	Inc_earn_rent	<ul style="list-style-type: none"> Rental of land / property 		If H6.2 == 1
H7.3	Inc_earn equip	<ul style="list-style-type: none"> Rental of farm equipment / animals 		If H6.3 == 1
H7.4	Inc_earn_saleanim	<ul style="list-style-type: none"> Sale of livestock 		If H6.4 == 1
H7.5	Inc_earn_animprod	<ul style="list-style-type: none"> Revenue from livestock products 		If H6.5 == 1
H7.6	Inc_earn_asset	<ul style="list-style-type: none"> Sale of household assets 		If H6.6 == 1

H7.7	Inc_earn_remit	<ul style="list-style-type: none"> Remittances from family outside the household, friends or others 		If H6.7 == 1
H7.8	Inc_earn_ssnt	<ul style="list-style-type: none"> Social Security National Insurance Trust, or SSNIT 		If H6.8 == 1
H7.9	Inc_earn_pension	<ul style="list-style-type: none"> Private pensions or other retirement payments 		If H6.9 == 1
H7.10	Inc_earn_govt	<ul style="list-style-type: none"> Social assistance payments from the government (i.e., scholarships, disability payments, etc.) 		If H6.10 == 1
H7.11	Inc_earn_ngo	<ul style="list-style-type: none"> Social assistance from aid programs, churches, NGOs, or other organizations 		If H6.11 == 1

I. Household Savings, Borrowing, and Shocks

	Name	Question	Response options/units	Notes/instructions
<i>Thank you. I would like to ask a few questions now about how your household manages expenses.</i>				
I1	Fin_credsource	In the past six months, has anyone in your household borrowed money?	1 Yes 2 No	If 2 >>> I3
I1.1	Fin_credfrom	Who did they borrow from?	1. COMMERCIAL BANKS 2. MICRO-FINANCE INST 3. VILLAGE COMMUNITY BANK (VICOBA) 4. NEIGHBOURS / FRIENDS 5. FAMILY 6. NGO OR SELF-HELP GROUPS 7. OTHER INFORMAL MONEY LENDER 8. OTHER, SPECIFY	If fin_credsource = yes
I2	Fin_amtbrw	In total, approximately how much has your household borrowed in the past 1.5 years?	TZ shillings	If yes to “has your household borrowed”
I3	Fin_wntloan	If you wanted to get a loan of to cover your expenses or buy farm inputs, do you think you or anyone in your household would be able to do that?	1 Yes 2 No 996 Don't know	
I4	Fin_bankacct	Do you or anyone else in your household have a bank account, either with a commercial bank, a credit union, or other similar institution?	1 Yes 2 No 996 Don't know	If yes or maybe to previous If 2 OR 996 >>> I6
I5	Fin_bankname	Please list up to 3 institutions with whom you or a member of your household has a savings account.	Enter name 998 Can't recall / remember	If Fin_bankacct = yes If 998 >>> I6
I5.1	Fin_bankyear	What year did you open the account?	Enter year 998 if can't recall	If Fin_bankacct=yes
I5.2	Fin_bankmonth	What month did you open the account?	Enter month 998 Can't recall / remember	If Fin_bankacct = yes
I6	Fin_shock	Did your household experience any unusual problems during the past year that affected your HH's ability to eat or changed what your household owned?	1 Yes 2 No 996 Don't know	If 2 OR 996, skip to next section.
I7	Fin_typshock	Please select the first and second events that had the biggest impact on	1 DROUGHT/BAD	If yes to previous

		your household in the past 12 months.	RAINFALL 2 FLOODS 3 LANDSLIDES & MUDSLIDES 4 CROP PESTS & DISEASE 5 LIVESTOCK DISEASES 6 HIGH COST OF SEED, FERTILIZER 7 JOB LOSS FOR A HH MEMBER 8 SERIOUS ILLNESS, ACCIDENT, OR DEATH OF HH MEMBER 9 INSECURITY/VIOLENCE 990 OTHER, SPECIFY	Select top two.
--	--	---------------------------------------	--	-----------------

J. Food Security

	Name	Question	Response options/units	Notes/instructions
<i>In this next set of questions, I want to ask about your food situation. Thank you.</i>				
J1	Fd_season	In the last 12 months, have you been faced with a situation when you did not have enough food to feed the household?	1 Yes 2 No	If 2 >>> J2
J1.1	Fd_seasonday	For how long did you face this situation?	Enter days.	
J2	Fd_worry	During the past 12 months, did you worry that your household would not have enough food?	0 No (it did not happen) 1 Rarely (once or twice) 2 Sometimes (three to ten times) 3 Often (more than 10 times)	
J3	Fd_kinds	During the past 12 months, did it happen that you or someone in your household were not able to eat the <u>kinds of foods you would have preferred</u> to eat because of lack of resources?	0 No (it did not happen) 1 Rarely (once or twice) 2 Sometimes (three to ten times) 3 Often (more than 10 times)	(Note emphasis on KINDS of foods)
J4	Fd_fewml	During the past 12 months, did it happen that you or any other household member had to eat <u>fewer meals in a day</u> because there was not enough food?	0 No (it did not happen) 1 Rarely (once or twice) 2 Sometimes (three to ten times) 3 Often (more than 10 times)	
J5	Fd_nofood	During the past 12 months, did it happen that there was <u>no food to eat of any kind</u> in your house, because of lack of resources to get food?	0 No (it did not happen) 1 Rarely (once or twice) 2 Sometimes (three to ten times) 3 Often (more than 10 times)	
	Fd_bed	During the past 12 months, did it happen that you or any household member <u>went to sleep at night hungry</u> because there was not enough food?	0 No (it did not happen) 1 Rarely (once or twice) 2 Sometimes (three to ten times) 3 Often (more than 10 times)	

K. Self Efficacy

	Name	Question	Response options/units	Notes/instructions
<i>Thank you. Now I am going to read out some statements to you; please tell me how true each of the statements is about you.</i>				
K1	Eff_solve	I can always manage to solve my problems if I try hard enough	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K2	Eff_opp	If someone opposes me, I can find the means and ways to get what I want	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K3	Eff_acco	I am certain I can accomplish my goals	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K4	Eff_shocks	I am confident that I could deal effectively with unexpected events	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K5	Ef_resour	Thanks to my resourcefulness, I can handle unforeseen situations	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K6	Eff_effort	I can solve most problems if I invest the necessary effort	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K7	Eff_calm	I can remain calm when facing difficulties because I can rely on my strength to cope	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K8	Eff_alter	When I am confronted with a problem, I always look for an alternative solution	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K9	Eff_troub	If I am in trouble, I can think of a good solution	I not at all true;2 hardly true;3 moderately true;4 exactly true	
K10	Eff_hnd	I can handle whatever comes my way	I not at all true;2 hardly true;3 moderately true;4 exactly true	

*Skip to section M after this Module for male head of households.
Skip to section L.A Time Allocation after this Module for female head of households.*

L. Wives/Partners Survey

	Name	Question	Response options/units	Notes/instructions
<i>Thank you for agreeing to answer a few of our questions. We are going to start with some questions to record your basic information.</i>				
L1	wives_consent	Did the respondent consent?	1 Yes 2 No	If 2 >>> End Interview
L2	wives_wmarried	What is your marital status	1=Monogamously married 2=Polygamously married	
L3	wives_wage)	What is your age?	years	
L4	wives_wreligion	What is your religion, if any?	1. Christian (Protestant) 2. Christian (Catholic) 3. Muslim 4. None 5. Other	
L5	wives_wed	What is the highest level of education you have attained?	PRIMARY P1.....11 P2.....12 P3.....13 P4.....14 P5.....15 P6.....16 P7.....17 FORM F1.....21 F2.....22 F3.....23 F4.....24 'O'+COURSE.25 F5.....31 F6.....32 'A'+COURSE.33 DIPLOMA...34 U1.....41 U2.....42 U3.....43 U4.....44 U5&+.....45	
L6	wives_wborn	Were you born in this village?	1 Yes 2 No	If 1 >>> L9
L7	wives_wborndist	Where is the village where you were born?		
L8	wives_wyrslive	How many years have you lived in this village?		

L9	Wives_looshus	In the next 5 years, how worried would you be about losing your land if your husband died?	1 Very Worried 2 Somewhat Worried 3 Not worried at all 996 DK 997 Refused to answer	
L10	wives_takeextfam	In the next 5 years, how likely is it that someone from within your extended family will take over the use of this field without your HH's permission/agreement?	1=Very Likely 2=Likely 3=Neutral 4=Somewhat unlikely 5=Very unlikely 996=Don't know 997=Prefer not to reply	
Now I'd like to ask you some questions about your participation in certain types of work activities and on making decisions on various aspects of household life				
L11	wives_part	Did you yourself participate in [ACTIVITY] in the past 12 months (that is, during the last [one/two] cropping seasons), from [PRESENT MONTH] last year to [PRESENT MONTH] this year? A) Food crop farming B) Cash crop farming C) Livestock raising D) Non-farm economic activities. E) Wage and Salary employment F) Fishing or fishpond culture G) Major hh expenditures H) Minor hh expenditures	1 Yes 2 No	If emp_part==No -> skip to next activity. Activity:
L12	wives_decision	When decisions are made regarding [ACTIVITY], who is it that normally takes the decision?	1. Self 2. Spouse 3. Both spouse and self (joint decision making) 4. Other HH member 5. Other Non-HH member 999. N/A	If emp_decision==1, skip to next activity. No response needed if activity==G or H.
L13	Wives_decisionfreq	When decisions are made regarding [ACTIVITY], how often does the decision maker inform you about the decision?	1 Always 2 Sometimes 3 Rarely 4 Never 5 Unsure	If emp_decision != 1 answer this
L14	wives_input	How much input did you have in making decisions	1. No input or input in few	If emp_input==98, skip

		about [ACTIVITY] in the past 12 months?	decisions, 2. Input into some decisions, 3. Input into most or all decisions, 98. No decision made/Not sure	to next activity
L15	emp_extent	To what extent do you feel you can make your own personal decisions regarding [ACTIVITY] if you want(ed) to?	1. Not at all, 2. Small extent, 3. Medium Extent, 4. To a high extent.	
L16	emp_use_inc	How much input did you have in decisions on the use of income generated from [ACTIVITY]	1. No input or input in few decisions, 2. Input into some decisions, 3. Input into most or all decisions, 98. No decision made/Not Sure	No response needed if activity==G or H.
L18	Wives_hearing	How confident are you that you would receive a fair hearing if you had a land dispute?	1 Very confident 2 Somewhat confident 3 Unsure 4 Not confident 5 Very unconfident	
L19	Wives_takepos	Do you think it's possible that someone could try to take one of your parcels from you without your permission, say in the next 5 years?	1 Yes 2 No	Enumerator should specify only the parcels in targeted commune if the respondent has parcels in other communes If 2 >>> L22
L20	Wives_expro	How likely do think it is that someone would try to take one of your parcels from you in the next 5 years?	1 Unlikely 2 Somewhat likely 3 Very likely/it is happening now	If wives_takepos = yes
L21	Wives_reason	Which if any of the following are reasons why you think this could happen? <ul style="list-style-type: none"> • Ongoing or past disputes or expropriation • Lack of documents • Length of agreement (if lease agreement for example) • Problems experienced by others in the community 	1 More important reason 2 Less important reason 3 Not a reason	If per_takepos = yes
L22	Wives_meet	How many group/village meetings have you attended in the past six months?	Enter number	
L22.1	Wive_meet_n	What kind of meetings have you attended?	1. Kitongoji Meetings 2. Village Meetings 3. Farmers' cooperative meetings	If wives_meet !=0

			4. SACCOS or self-help group meeting 5. School meetings (SMC or parents) 6. Other	
L22.2	Wives_meetfreq_n	How many times did you attend [MEETING]?	Enter number	
L22.3	Wives_speak	How many of those meetings have you spoken to the group?	Enter number	
L22.4	Wives_speakfreq	How many times did you speak at [MEETING]?	Enter number	If wives_speak != 0
L23	Wives_comfort	Do you feel comfortable speaking at village meetings or in group settings?	1 Yes 2 No	
L24	Wives_wgroup	Are there women's groups in the village or surrounding area?	1 Yes 2 No	If yes, continue If 2 >>> L26
L25	Wives_wattend	How many women's group meetings have you attended?	Enter number	If >0, continue
L25.1	Wive_totattend	How many women would you estimate were at the meeting?	Enter number	If many meetings (>10) were attended, this should refer to average.
L26	Wives_Lan_dcd_i	Who primarily decides how to use this household's parcel(s)?	1=Self 2=Spouse 3=Both self and spouse together 4=Other male household member 5=Other female household member 990=Other, specify	
L27	Wives_Lan_inco_i	Who decides how to use any income generated from the use of this household's parcel(s)?	1=Self 2=Spouse 3=Both self and spouse together 4=Other male household member 5=Other female household member 990=Other, specify	
Next I'd like to ask about your household's experience with borrowing money or other items in the past 12 months.				
L28	Wives_loan	Over the past 12 months, did you or anyone else in this household borrow from someone outside the household or from an institution receiving either cash, goods, or services?	1 Yes 2 No	If 2 >>> L29
L28.1	Wive_loan_source	What was the source of the loan(s)?	1 COMMERCIAL BANKS 2 MICRO-FINANCE INST 3 VILLAGE COMMUNITY BANK (VICOBA)	Select all that apply

			4 NEIGHBOURS / FRIENDS 5 FAMILY 6 NGO OR SELF-HELP GROUPS 7 OTHER INFORMAL MONEY LENDER 990 OTHER, SPECIFY	
L28.2	Wives_loan_dec	Who made the decision to borrow from [SOURCE] most of the time?	1 SELF 2 SPOUSE 3 Both spouse and self (joint decision making) 4 OTHER HH MEMBER 5 OTHER NON-HH MEMBER 999 NOT APPLICABLE	Select all that apply
L28.3	Wives_loan_decuse	Who makes the decision about what to do with the money/ item borrowed from [SOURCE] most of the time?	1 SELF 2 SPOUSE 3 Both spouse and self 4 OTHER HH MEMBER OTHER NON-HH MEMBER 999 NOT APPLICABLE	Select all that apply
L28.4	Wives_loan_use	What did you use this loan/credit for?	1 SUBSISTENCE NEEDS 2 MEDICAL COST 3 SCHOOL FEES 4 CEREMONY/WEDDING 5 PURCHASE LAND 6 PURCHASE AGRIC. INPUTS 7 OTHER BUSINESS INPUTS 8 PURCHASE AGRIC. MACHINERY 9 BUY/BUILD DWELLING 990 OTHER(SPECIFY)	
L29	Wives_Lan_doc_i	Do you or your household have any kind of documentation of your rights to your HH's parcels?	1 Yes 2 No	If 2 >>> L31
L29.1	Wives_Lan_typedoc_i	What kind of documentation? SELECT ALL THAT APPLY	1. GRANTED RIGHT OF OCCUPANCY 2. CERTIFICATE OF CUSTOMARY RIGHT OF OCCUPANCY 3. INHERITANCE LETTER 4. OTHER GOVERNMENT DOCUMENT	If land_doc_i=yes next question

			5. OTHER DOCUMENT OR LETTER (NON-GOVERNMENT/UNOFFICIAL)	
L29.2	Wives_Lan_docobtain_i	When did you obtain the documentation?	Year/Month	If wives_land_doc_i=yes next question
L29.3	Wives_Lan_docobtain_i	How many people have ownership rights under this documentation?		Enter number
Now I am going to read out some statements to you; please tell me how true each of the statements is about you.				
L30	Wives_Eff_solve	I can always manage to solve my problems if I try hard enough	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L31	Wives_Eff_opp	If someone opposes me, I can find the means and ways to get what I want	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L32	Wives_Eff_accu	I am certain I can accomplish my goals	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L33	Wives_Eff_shocks	I am confident that I could deal effectively with unexpected events	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L34	Wives_Ef_resour	Thanks to my resourcefulness, I can handle unforeseen situations	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L35	Wives_Eff_effort	I can solve most problems if I invest the necessary effort	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L36	Wives_Eff_calm	I can remain calm when facing difficulties because I can rely on my strength to cope	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L37	Wives_Eff_alter	When I am confronted with a problem, I always look for an alternative solution	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L38	Wives_Eff_troub	If I am in trouble, I can think of a good solution	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L39	Wives_Eff_hnd	I can handle whatever comes my way	1 not at all true;2 hardly true;3 moderately true;4 exactly true	
L40	Per_landlaw	How well do you understand the official land laws?	1 Very well 2 Familiar but don't know the details 3 Familiar with some rules but don't know if they are official law 4 Unsure	
L41	Wives_CCRO	Have you heard of CCROs?	1 Yes 2 No	If 2 >>>Wives_LTA
L41.1	Wives_payCCRO	In general, how much (if anything) would you be willing to pay to have one of your parcels surveyed and to receive a CCRO?		Enter amount in TShs.
L42	Wives_LTA	Have you heard of [LTA]?	1 Yes 2 No	If 2 >>> Next section. DO NOT PROMPT IF

				RESPONDENT HAS NOT HEARD OF LTA.
L42.1	Wives_LTArec	Which of the following did you receive through LTA?	<ul style="list-style-type: none"> • Land was surveyed • CCRO • Notarized title • None of the above 	If Wives_LTA= yes
L42.2	Wives_LTAimpr	What was your impression of LTA?	1 Very positive 2 Somewhat positive 3 Neutral 4 Somewhat negative 5 Very negative	If Wives_LTA = yes
L42.3	Wives_docyben	Do you believe that having documentation of your land rights through LTA benefits your household?	1 Yes 2 No	
L42.4	Wives_LTAcom	<p>Do you think LTA has benefited your community in any of the following ways:</p> <ul style="list-style-type: none"> • Protects against losing land • Protects against disputes with neighbors • Makes it easier to rent out • Makes it easier to sell • Will make inheritance easier • Other <p>SELECT ALL THAT APPLY</p>	<p>1. YES</p> <p>2. NO</p>	If Wives_docyben = yes

L.A Time Allocation

Now I'd like to ask you about how you spent your time during the past 24 hours. We'll begin from yesterday morning, and continue through to this morning. This will be a detailed accounting. I'm interested in everything you do (i.e. resting, eating, personal care, work inside and outside the home, caring for children, cooking, shopping, socializing, etc.), even if it doesn't take you much time.

PLEASE RECORD A LOG OF THE ACTIVITIES FOR THE INDIVIDUAL IN THE LAST COMPLETE 24 HOURS (STARTING YESTERDAY MORNING AT 4 AM, FINISHING 3:59 AM OF THE CURRENT DAY). THE TIME INTERVALS ARE MARKED IN 15 MIN INTERVALS AND ONE ACTIVITY CAN BE MARKED FOR EACH TIME PERIOD BY DRAWING AN X THROUGH THAT ACTIVITY.

Activity		Night			Morning					Day					Day		
		4	5	6	7	8	9	10	11	12	13	14	14	15	16	17	
A	Sleeping and resting																
B	Eating and drinking																
C	Personal care																
D	School (also homework)																
E	Work as employed																
F	Own business work																
G	Farming/livestock/fishing																
H	Shopping/getting service (incl health services)																
I	Weaving, sewing, textile care																
J	Cooking																
K	Domestic work (incl fetching wood and water)																
L	Care for children/adults/elderly																
M	Travelling and communiting																
N	Watching TV/listening to radio/reading																
O	Exercising																
P	Social activities and hobbies																
Q	Religious activities																
R	Other, specify...																

Activity		Evening			Night							
		17	18	19	20	21	22	23	24	1	2	3
A	Sleeping and resting											
B	Eating and drinking											
C	Personal care											
D	School (also homework)											
E	Work as employed											
F	Own business work											
G	Farming/livestock/fishing											
H	Shopping/getting service (incl health services)											
I	Weaving, sewing, textile care											
J	Cooking											
K	Domestic work (incl fetching wood and water)											
L	Care for children/adults/elderly											
M	Travelling and communiting											
N	Watching TV/listening to radio/reading											
O	Exercising											
P	Social activities and hobbies											
Q	Religious activities											
R	Other, specify...											

Capture GPS at this point

FOR FEMALE HEAD OF HOUSEHOLDS CONTINUE TO SECTION M AFTER FILLING OUT THE TIME USE SURVEY.

M. Sketch map instructions

The purpose of the sketch map exercise is to improve the accuracy with which parcels can be re-identified in follow-up rounds of the survey. The sketch map exercise should be carried out just prior to the Land Holdings and Characteristics section of the questionnaire. The enumerator should draw the sketch map, with instructions from the respondent and any other household members present. The parcel on which the interview is being conducted should be located in the center of the map. Each of the household's other parcels should be indicated on the map according to the distance and direction and the respondent indicates. On the sketch map, the enumerator should record the following for each of the parcels:

- Time it takes to reach that parcel by foot from the home
- Name of the parcel
- Size of the parcel
- How long ago did the household acquire (or begin renting) the parcel?
- Type of terrain
- Land use in the past season (agriculture, left fallow, non-agricultural use)
- If agriculture, the main crop that is grown on the parcel

The map should also show geographic features such as rivers, roads, mountains, and the village center that will help to show where the parcel is.

[TAKE PHOTO OF SKETCH]

GPS STAMP.

ANNEX C: MIDLINE SURVEY INSTRUMENT

ADMINISTRATIVE INFORMATION

L. Admin info

Household number	<input type="text"/>		
Date of interview:	DD <input type="text"/>	MM <input type="text"/>	YY <input type="text"/>
Time of interview: (24 hour clock)	Start MM	HH	Stop HH MM
Name of interviewer:	<input type="text"/>		
Code of interviewer	<input type="text"/>		
Place of interview:	<input type="text"/>		
Ward	<input type="text"/>		
Village	<input type="text"/>		
Point of interview	1. Respondent's residence 2. In one of the household's parcel of land 3. Away from respondent's place of residence and/or parcel of land		
GPS Coordinates	<input type="text"/>		
Number of visits (max. of 3)			
Reason for call back	Number of visits		
	1	2	3
Refused to be interviewed		1	1
Target respondent not at home		2	2
Target respondent requested for a call back			
No one in the household		3	3
Respondent not able to be interviewed due to medical reasons (very sick, dumb, etc.)		4	4
No adult member in the household		5	5
Language barrier		6	6
Not applicable		99	99
Outcome of final visit	Successful	Incomplete	Replaced

Field quality control checks (sign as appropriate)		
Activity	Activity undertaken by	
	Interviewer	Supervisor
Reviewed	<input type="text"/>	<input type="text"/>
Accompanied	<input type="text"/>	<input type="text"/>
Back checked	<input type="text"/>	<input type="text"/>
Called back	<input type="text"/>	<input type="text"/>

M. HH Roster info

B1.2	hou_num_n	How many members constitute this household?	Enter number of household members based on hou_nme.	
B1.3	hou_nme	Can you tell me the name of all the members of this household?		RECORD THE HOUSEHOLD MEMBERS BEGINNING WITH THE HOUSEHOLD HEAD, FOLLOWED BY THE SPOUSE AND THEN THE CHILDREN STARTING WITH OLDEST FIRST AND CONCLUDING WITH THE YOUNGEST.
B5	hou_age_n	How old is [NAME] in completed years?		Enter age. Enter 996 for Don't Know.

N. Agricultural Organizations, Services and Training

	Name	Question	Response options/units	Notes/instructions
C3	org_srv	Did you or anyone in your household receive any agricultural extension services in the past 12 months?	3. Yes 4. No 997. Don't know	If 2 >>> C5
C3.1	org_prd	What kind of services were provided?	13. Access to improved seed 14. Fertilizer, pesticides and other chemical inputs 15. Tractor services 16. Marketing services 17. Transport services 18. The opportunity to participate in a value chain scheme 19. Help to form or strengthen farmer groups 20. Contract farming 21. Post-harvest processing of ANY of crops (including drying, sorting, packaging, and/or storing) 22. Purchasing of ANY of the crops 23. Training on agricultural production and/or processing 24. Training on business practices 991. Other, SPECIFY _____	If org_srv = yes
C3.2	org_used_srv	How often has anyone in your household made use of extension services in the past 12 months?	6 3 times or more 7 Once or twice 8 Never	
C4	org_trnd	In the past 12 months, have you or anyone in your household received any kind of community or organizational assistance related to agriculture, such as assistance from an NGO or community group?	3. Yes 4. No 997. Don't know	If org_trnd != 1 skip to next module If 2 OR 996 >>> Next Section
C4.1	org_what	What kind of services were provided?	8. Free food/maize distribution 9. Food-for-work programme or cash-for-work	

			programme 10. Inputs-for work programme 11. Attended a training or workshop 12. Had an agent visit my/our parcel(s) 13. Read a pamphlet 14. Other assistance (not listed above)	
C4.2	org_frequ	For how many days in the past 12 months did you or anyone in your household receive these services?	Enter days	
C5	org_name	Are you aware of these organizations working in your village? MARK ALL THAT APPLY	24. One Acre Fund 25. Briten 26. Unicef 27. Eadd 28. Cuamm 29. Clinton Foundation 30. Tahea 31. Camfed 32. Cefa 33. Wopata 34. Jica 35. TIB 36. Concern 37. Tunajali 38. SNV 39. TNRF 40. TCD 41. IMO 42. Cheet 43. Restless Development 44. LEAT 45. Caltas	Select all that apply

O. Landholdings and Characteristics

	Name	Question	Response options/units	Notes/instructions
<i>Thank you for the earlier responses. I would now like to ask you a few questions about your landholdings and the parcels you farm.</i>				
D1	Lan_num	How many different parcels does the household own, rent, or use?	Enter number	
D2	Lan_name	Please give each parcel a name so we can keep track during the interview		If lan_num > 1. From here down, ask for each parcel.
D6	Lan_size_i	What is the size of [PARCEL ID]?	Quantity	Unit
D12	Lan_doc_i	Do you or your household have any kind of documentation of your rights to any of your parcels?	3. Yes 4. No 997. Don't know	If Lan_doc_i != 2 OR 996 skip to Lan_use_i (D13)
D12.1	Lan_docparcel_i	Which parcels?	Record Parcel IDs	
D12.2	Lan_typedoc_i	What kind of documentation? SELECT ALL THAT APPLY.	6. GRANTED RIGHT OF OCCUPANCY 7. CERTIFICATE OF CUSTOMARY RIGHT OF OCCUPANCY (CCRO) 8. INHERITANCE LETTER 9. OTHER GOVERNMENT DOCUMENT 10. OTHER DOCUMENT OR LETTER (NON-GOVERNMENT/UNOFFICIAL)	
D12.3	Lan_docobtain_i	What year did you obtain the documentation for [PARCEL ID]?	Year	If land_doc_i=yes next question. 996 if unsure/don't know.
D12.4	Lan_docobtainmon_i	What month did you obtain the documentation for [PARCEL ID]?	Month	Enter 996 if unsure/ don't know
D12.5	Lan_docnum_i	How many people in household have their names listed on the documentation you have for [PARCEL ID]?		Enter number; If don't know, enter 996
D12.6	Lan_docwho_i	Who in the household is listed as the primary land user on the documentation for [PARCEL ID]?	5. Self/Husband 6. Wife/Spouse 7. Jointly listed (husband/wife) 8. Other 997. Don't know	
D12.7	Lan_docphys_i	Do you have a personal copy of the document?	1 Yes 2 No	If lan_typedoc_i == 2 (ccro) If 2 >>> D12.9

D12.8	Lan_docloc_i	Where do you store a copy of the document?	5. In homestead 6. With a nearby family member 7. At the village center 8. At the DLO/With the government	If lan_typedoc_i == 2 (ccro)
D12.9	Lan_docuse_i	Have you ever had to reference the document?	1 Yes 2 No	If lan_typedoc_i == 2 (ccro) If 2 >>> D13
D12.10	Lan_docusetype_i	Why did you reference the document?	6. To resolve a dispute 7. To obtain a loan 8. To plan inheritance 9. To prove ownership (not dispute related) 10. As part of a rental agreement 991. Other	Lan_docuse_i == yes
D13	Lan_use_i	During last year's agricultural seasons, did your household farm [PARCEL ID], leave it fallow, or use it for pasture or some other non-agricultural use?	1 Farmed this parcel 2 Left this parcel fallow 3 Used this parcel as pasture/other non-agricultural use	
D17	Lan_inherp_i	Do you have an inheritance plan for your parcels?	1 Yes 2 No	If no skip to lan_svy_i
D17.1	Lan_inhe_who_i	Have you discussed this plan with anyone?	1 Yes 2 No	If not skip to lan_svy_i
D17.2	Lan_inhe_name	Who have you discussed this with?	1 Wife/Spouse 5 Children 3 Other Family 9 Village leaders 10 Other	
D18	Lan_svy_i	Have your parcels ever been mapped by surveyor?	1 Yes 2 No 996 Don't know	If 2 OR 996 >>> D24
D24	Lan_irr_i	Are your parcels irrigated?	1 Yes 2 No	
D25	Lan_restyn_i	Have you ever left any of your parcels fallow?	1 Yes 2 No	If 2, skip to lan_imp_i
D25.1	Lan_rest_i	What was the most recent year in which you left any of your parcels fallow?		Enter 996 if don't know;

D25.2	Lan_restperct_i	What portion of your parcels were left fallow?	Enter percentage	Answer only if lan_restyn_i = 1
D26	Lan_imp_i	For each of the following items I am going to ask about, I want to know if you have made any of the following improvements to this parcel in the past six months		
D26.1	Lan_imp_well_i	<ul style="list-style-type: none"> Digging wells or pump irrigation 	1 Yes 2 No	
D26.2	Lan_imp_building_i	<ul style="list-style-type: none"> Erecting buildings 	1 Yes 2 No	
D26.3	Lan_imp_fence_i	Erecting fencing	1 Yes 2 No	
D26.4	Lan_imp_terr_i	<ul style="list-style-type: none"> Terracing 	1 Yes 2 No	
D26.5	Lan_imp_soil_i	<ul style="list-style-type: none"> Soil conservation 	1 Yes 2 No	

P. Perceptions of land rights

	Name	Question	Response options/units	Notes/instructions
		Ok. I would like to ask you about some issues around land in this village. I only want to talk about parcels here (in this village), not things you may have heard in nearby villages (or plots you may have elsewhere).		Leave out mention of parcels in other villages if it is not relevant.
F1	Per_takepos	In the next five years, do you think it's possible that someone could try to take one of your parcels from you without your permission?	1 Yes 2 No 996 Don't know	If 2 OR 996 >>> F6
F2	Per_expro	How likely do think it is that someone would try to take one of your parcels from you in the next 5 years?	1 Possible but unlikely 2 Somewhat likely 3 Very likely/it is happening now	If per_takepos = yes
F4	Per_source_i	Who do you think would try to take your parcels?	8. Government 9. Foreign investor 10. Tanzanian investor (from outside the village) 11. Someone inside the village 12. Absentee owner/land claimants 13. Extended family 14. Other	If per_expro != 1
F5	Per_reason	Which if any of the following are reasons why you think this could happen? Please rank from the most important reason to the least important reason	Enter rank order. If one or more options are not relevant, ask for top rank and then determine which seem the least irrelevant of	If per_takepos = yes

		5. Ongoing or past disputes or expropriation 6. Lack of documents 7. Length of agreement (if lease agreement for example) 8. Problems experienced by others in the community	the irrelevant options and work from there.	
F7	Per_comworry	In general, how many people in your community are worried that someone might try to take their land against their will?	1 None or very few 2 Some are worried but most are not 3 Most are worried but not all 4 All or nearly all are worried	
F8	Per_borpos	Do you think it's possible that you could have a dispute over the borders of one of your parcels with a neighbor in the next 5 years?	1 Yes 2 No	If 2 >>> F10
F9	Per_disputeprob	How likely do think it is that you could have a dispute over the borders of one of your parcels with a neighbor in the next 5 years?	1 Possible, but unlikely 2 Somewhat likely 3 Very likely/it is happening now	If per_borpos = yes
F10	Per_reasonwhy	Which if any of the following are reasons why you don't think this is possible? <ul style="list-style-type: none"> • My family has owned/used the parcel for a long time • Lack of problems in the past • Land has been surveyed • HH has documentation of rights • Village Council/Elders/Leaders can easily address potential disputes 	Select all that apply.	If per_takepos = no
F14	Per_future	In the next 12 months, do you expect problems with land disputes will improve, stay the same, or get worse?	1 Improved 2 Stayed the same 3 Gotten worse	
F15	Per_coma	Do you use communal pasture land?	1 Yes 2 No	If 2 >>> F17
F16	Per_coml	Do you think it is possible that you will lose your existing rights on communal pasture land in the next 12 months?	1 Yes 2 No 996 Don't know	Answer if per_coma=Yes If 2 OR 996 >>> F17
F16.1	Per_coml_why	How likely do you think it is that you would lose your existing rights on communal pasture land in the next 12 months	1 Highly likely 2 Somewhat likely 3 Possible but unlikely	If per_coml = Yes
F16.2	Per_comr	Why do you think you will lose your existing rights on communal pasture land in the future?	1= Local farmers encroaching onto communal land or access routes. 2= Village will decide to allocate the land for other uses. 3= The government will allocate the communal land to an investor	Answer if per_coml=Yes

			990= Other (please specify)	
F17	Per_fallow	How much of a risk is there that someone will take over one of your plots if you leave it fallow?	1 Very high risk 2 Somewhat risky 3 No risk 4 Unsure	
F18	Per_inheritforce	In general, do you feel that your plans for land inheritance will be enforced?	1 Yes 2 No 996 Don't know/unsure	
F19	Per_landlaw	How well do you understand the official land laws?	1 Very well 2 Familiar but don't know the details 3 Familiar with some rules but don't know if they are official law 4 Unsure	
F20	Per_CCRO	Have you heard of CCROs?	1 Yes 2 No	If 2 >>>Per_LTA. DO NOT PROMPT IF RESPONDENT HAS NOT HEARD OF CCROs.
F20.1	Per_payCCRO	In general, how much (if anything) would you be willing to pay to have one of your parcels surveyed and to receive a CCRO?		
F21	Per_LTA	Have you heard of LTA?	1 Yes 2 No	If 2 >>> Next section. DO NOT PROMPT IF RESPONDENT HAS NOT HEARD OF LTA!
F21.1	Per_LTAvisit	Did LTA visit your parcel in the past 2 years?	1 Yes 2 No	If 2 >>> Next section
F21.2	Per_LTArec	Which of the following did you receive through LTA? MARK ALL THAT APPLY	<ul style="list-style-type: none"> • Land was surveyed/ mapped • CCRO • Notarized title • None of the above 	If Per_LTAvisit= yes
F21.3	Per_LTAinfo	Before the LTA process began, did you receive any information about what was going to happen?	1 Yes 2 No	If no >>> Per_LTAtime
F21.4	Per_LTAinfo type	What kind of information? Select all that apply	<ul style="list-style-type: none"> • community meetings with VEO • community meetings with LTA • individually consulted by VEO • Individually consulted by LTA • Other 	
F21.5	Per_LTAsuff	Did you feel this information was sufficient for you to understand what was happening and how you could obtain your CCRO?	1 Yes 2 No	

F21.6	Per_LTAmap	Were you present when your parcels were being mapped?	1 Yes 2 No	Only answer if “Land was surveyed/mapped” as part of Per_LTArec
F21.7	Per_LTAmappres	Would you have like to have been present when your parcels were being mapped?	1 Yes 2 No	If Per_LTAmap = no
F21.8	Per_LTAverify	During the verification process, did you feel you were adequately informed about who was claiming rights to what parcel?	1 Yes 2 No	
F21.9	Per_LTAverifypeople	During the verification process, do you think there were there other people in the village who felt that they were not adequately informed about who was claiming what parcel?	1 Yes 2 No	
F21.10	Per_LTAtime	When did LTA visit your parcel?	Month/Year	If Per_LTAvisit = yes
F21.11	Per_LTAmap	When did [Per_LTArec response] take place?	Month/Year	Based on Per_LTArec
F21.12	Per_LTAprocess	How long did the LTA process take?	Enter days	
F21.13	Per_LTAprob	Did you encounter any issues during the LTA process	1 Yes 2 No	If per_LTAvisit = yes If 2 >>> F21.8
F21.14	Per_LTAprobtype	What kind of issues did you encounter?	2. Issue related to existing land dispute 3. Issue related to new dispute caused by mapping 4. Missed deadline 5. Other	If Per_LTAprob = yes
F21.15	Per_CCRO	How much time passed between mapping and receipt of your CCRO?	Enter months	If per_LTArec = CCRO
F21.16	Per_LTAimpr	What was your impression of LTA?	1 Very positive 2 Somewhat positive 3 Neutral 4 Somewhat negative 5 Very negative	If Per_LTA = yes
F21.17	Per_docyben	Do you believe that having documentation of your land rights through LTA benefits your household?	1 Yes 2 No 996 Don't know	
F21.18	Per_LTAcom	What are the benefits to LTA in your village? ALL THAT APPLY	<ul style="list-style-type: none"> Protects against losing land Protects against disputes with neighbors Makes it easier to rent out Makes it easier to sell Will make inheritance easier Other 	If per_docyben = yes

Q. Land disputes

	Name	Question	Response options/units	Notes/instructions
<i>This next line of questioning addresses disputes around land in the village. As a reminder, we are not going to share your responses with anyone else in the village or to anyone in the government. Your responses will not affect whether this village receives services or not. We just want to learn more about disputes here.</i>				
G1	Dis_dis	In the past six months, has anyone in your household been involved in any dispute or argument about land- for example, about who owns or has rights to a parcel, boundaries of parcels, or inheritance of land?	1 Yes 2 No	If 2 >>> Next section
G1.1	Dis_disnum	How many disputes?	#	
G1.3	Dis_own_j	Does the household currently use the parcel over which the dispute occurred?	1 Yes 2 No	
G1.5	Dis_type_j	What was the dispute related to? Select all that apply.	1 Land that the household owned or was using 2 The household trying to acquire new land 3 Land rented from the household 4 Land rented by the household 5 Inheritance 6 Grazing 7 Other	If 8 >>> G1.6 9 >>> G1.7 10 >>> G1.8 11 >>> G1.9 12 >>> G1.10 13 >>> G1.11
G1.6	Dis_desc1_j	Which of the following best describes the dispute?	1 Someone who lives in the area tried to take the household's land 2 Someone from outside the area tried to take the household's land 3 Boundary dispute with neighbor 4 Government tried to take the land or stop the household from using it	If dis_type_j = 1
G1.7	Dis_desc2_j	Which of the following best describes the dispute?	1 The household bought/claimed/requested some new land, but someone else claimed to be the owner 2 The household did not buy the land but wanted land that someone else was using 3 None of the above	If dis_type_j = 2
G1.8	Dis_desc3_j	Which of the following best describes the dispute?	1 Payment of rent/crops 2 Length of rental agreement 3 Renter tried to claim ownership	If dis_type_j = 3

			4 Other	
G1.9	Dis_desc4_j	Which of the following best describes the dispute?	1 Payment of rent/crops 2 Length of rental agreement 3 Disagreement over ownership 4 Other	If dis_type_j = 4
G1.10	Dis_desc5_j	Which of the following best describes the dispute?	1 Disagreement with brothers/sisters over parents' land 2 Widow/widower whose land is being claimed by spouse's relatives 3 Other	If dis_type_j = 5 Need to tailor this one
G1.11	Dis_desc6_j	Which of the following best describes dispute?	1 Disagreement with pastoralists over grazing on land 2 Disagreement with non-pastoralists from the village over grazing on land 3 Disagreement with non-pastoralists from outside the village over grazing on land 3 Other	If dis_type_i=6
G2	Dis_desc7_i	Describe the dispute	Write response	If dis_type_i= 7
G3	Dis_yr_j	In what year did the dispute begin?		
G4		How long did the dispute last?	Months	
G5	Dis_serious_j	Overall, how serious was the dispute?	1 Very serious 2 Somewhat serious 3 Not serious	Guidance: "serious" here means that it disrupted or altered normal life activities.
G6	Dis_mny_j	Did you lose money because of the dispute?	1 Yes, a little (less than TZS 10,000) 2 Yes, a lot (more than TZS 10,000) 3 No	
G7	Dis_safe_j	Did the dispute make you worried about your safety?	1 Yes, a lot 2 Yes, a little 3 No	
G8	Dis_resolved_j	Was the dispute resolved?	1 Yes 2 No	If 2 >>> G9
G8.1	Dis_who_resolved_j	Who resolved the dispute?	1 We resolved it amongst ourselves 2 Others in the community 3 The Village Council 4 District Courts 6 District Officials 14 Village land use committee	If yes to dis_resolved_j Need to tailor

			8 Ward land use committee 10 Other	
G8.2	Dis_satis_j	How satisfied were you with how the dispute was resolved?	1 Very satisfied 2 Somewhat satisfied 3 Not satisfied	If yes to dis_resolved_j
G9		How likely is it that you will have another dispute like your dispute?	1 Very likely 2 Somewhat likely 3 Not likely 4 Unsure	

R. Non-Agricultural Income, Consumption, and Assets

	Name	Question	Response options/units	Notes/instructions
H1	Inc_own	Does your household currently own any of the following items in good working condition: [READ EACH OPTION OUT LOUD AND MARK IF ANSWER "YES" or ' NO'		
H1.1	Inc_own_radio	<ul style="list-style-type: none"> Radio or Radio Cassette 	1 Yes 2 No	
H1.2	Inc_own_mobile	<ul style="list-style-type: none"> Telephone(mobile) 	1 Yes 2 No	
H1.3	Inc_own_sewm	<ul style="list-style-type: none"> Sewing Machine 	1 Yes 2 No	
H1.4	Inc_own_tv	<ul style="list-style-type: none"> Television 	1 Yes 2 No	
H1.5	Inc_own_dvd	<ul style="list-style-type: none"> Video / DVD 	1 Yes 2 No	
H1.6	Inc_own_lanterns	<ul style="list-style-type: none"> Lanterns 	1 Yes 2 No	
H1.7	Inc_own_otherstove	<ul style="list-style-type: none"> Stove 	1 Yes 2 No	
H1.8	Inc_own_bicycle	<ul style="list-style-type: none"> Bicycle 	1 Yes 2 No	
H1.9	Inc_own_watches	<ul style="list-style-type: none"> Watches 	1 Yes 2 No	
H1.10	Inc_own_mnets	<ul style="list-style-type: none"> Mosquito net 	1 Yes 2 No	
H1.11	Inc_own_iron	<ul style="list-style-type: none"> Iron (Charcoal or electric) 	1 Yes 2 No	
H1.12	Inc_own_fanair	<ul style="list-style-type: none"> Fan/Air conditioner 	1 Yes 2 No	
H1.13	Inc_own_fields	<ul style="list-style-type: none"> Fields/Land 	1 Yes 2 No	

H1.14	Inc_own_solar	• Solar panel	1 Yes 2 No	
H1.15	Inc_own_house	• Houses/housing addition	1 Yes 2 No	
H1.16	Inc_own_poultry	• Poultry	1 Yes 2 No	
H1.17	Inc_own_livestock	• Livestock	1 Yes 2 No	
H1.18	Inc_own_other	• Other	1 Yes 2 No	
H1.11	Inc_own_radio_num	• Radio or Radio Cassette	Quantity	If inc_own_radio = yes
H1.21	Inc_own_mobile_num	• Telephone(mobile)	Quantity	If inc_own_mobile = yes
H1.31	Inc_own_sewm_num	• Sewing Machine	Quantity	If own_sewm_num = yes
H1.41	Inc_own_tv_num	• Television	Quantity	If inc_own_tv = yes
H1.51	Inc_own_dvd_num	• Video / DVD	Quantity	If inc_own_dvd = yes
H1.61	Inc_own_lanterns_num	• Lanterns	Quantity	If inc_own_lanterns=yes
H1.71	Inc_own_stove_num	• Stove	Quantity	If inc_own_stove = yes
H1.81	Inc_own_bicycle_num	• Bicycle	Quantity	If inc_own_bicycle = yes
H1.91	Inc_own_watches_num	• Watches	Quantity	If inc_own_watches = yes
H1.101	Inc_own_mnets_num	• Mosquito net	Quantity	If inc_own_mnets = yes
H1.111	Inc_own_iron_num	• Iron (Charcoal or electric)	Quantity	If inc_own_iron = yes
H1.121	Inc_own_fanair_num	• Fan/Air conditioner	Quantity	If inc_own_fanair = yes
H1.131	Inc_own_fields_num	• Fields/Land	Quantity	If inc_own_fields = yes
H1.141	Inc_own_solar_num	• Solar panel	Quantity	If inc_own_solar = yes
H1.151	Inc_own_house_num	• Houses/housing addition	Quantity	If inc_own_house = yes
H1.161	Inc_own_poultry_num	• Poultry	Quantity	If inc_own_poultry = yes
H1.171	Inc_own_livestock_num	• Livestock	Quantity	If inc_own_livestock= yes
H1.181	Inc_own_other_num	• Other	Quantity by specified item	If inc_own_other = yes
H2	Inc_own_an	Which of the following animals are owned by the household?	9. Cows, oxens and bulls 10. Horses, donkeys and mules 11. Pigs 12. Goats	

			13. Sheep 14. Poultry 15. Other 16. None	
H3	Inc_hwalls	What is the major construction material of the walls of the main dwelling?	7. POLES (INCLUDING BAMBOO), BRANCHES, GRASS) 8. POLES AND MUD/MUD AND STONES 9. MUD ONLY 10. MUD BRICKS 11. BAKED/BURNT BRICKS 12. CONCRETE, CEMENT, STONES 991. OTHER, SPECIFY	Enumerator should directly observe to confirm response.
H4	Inc_hroof	What is the major construction material of the main roof?	8. GRASS, LEAVES, BAMBOO 9. MUD AND GRASS 10. CONCRETE, CEMENT 11. METAL SHEETS (GCI) 12. ASBESTOS SHEETS 13. TILES 14. OTHER, SPECIFY	

A. Agricultural Production

E.1 Annual Crops

E1.2	Ann_difcrop_i	How many different crops did you grow on your plots?	Enter number	
E1.3	Ann_croprain_i	What crops were grown on during the past rainy season?		Select crops from list.
E1.6	Ann_soil_i	What did you use to till the soil on [PLOT ID]? (Select all that apply)	1 Hand hoe 2 Animal-drawn plows 3 Tractors or other machinery 990 OTHER, specify	
E1.12	Ann_intype_i	What type of input did you utilize during [season] on your plots? SELECT MULTIPLE	7. Fertilizer 8. Pesticide 9. Herbicide	

			10. Fungicide 11. Other 12. None	
E1.29	Ann_earn_all	How much did you receive in total from annual crop farm earnings in the last 12 months?	TZ shillings	

E.2 Perennial Crops

E2.1	Pere_crop_num	How many fruit trees and permanent crops do you grow on plots?	Enter number	
E2.1.1	Pere_crops	Please tell me all of the fruit trees and permanent crops that you grow on your plots?		Ask respondent to select from list of fruit and perennial crops. These questions are asked for each fruit and permanent crop.
E2.6	Pere_trees	In the past 12 months, how many non-fruit trees did you plant on any of your plots?	#	
E2.6.1	Pere_treeuse	What do you plan to use these trees for?	5. Wood 6. Timber/Lumber 7. Erosion control 8. Border demarcation 991. Other	If Pere_trees is not 0, if Other record response
E2.11.6	Pere_inc_i	How much did you receive in total from perennial and fruit crop farm earnings in the last 12 months?	TZ shillings	

Crops Codes

Cereals/tubers/roots: Maize.....11 Paddy.....12 Sorghum.....13 Bulrush Millet...14 Finger Millet....15 Wheat.....16 Barley.....17 Cassava.....21 Sweet Potatoes...22 Irish potatoes...23 Yams.....24 Cocoyams.....25 Onions.....26 Ginger.....27 Legumes, Oil & fruit: Beans.....31 Cowpeas.....32 Green gram.....33 Chick peas.....35 Bambara nuts....36 Field peas.....37 Sunflower.....41 Sesame.....42 Groundnut.....43 Soyabeans.....47 Caster seed.....48	Fruits: Passion Fruit....70 Banana.....71 Avocado.....72 Mango.....73 Papaw.....74 Orange.....76 Grapefruit.....77 Grapes.....78 Mandarin.....79 Guava.....80 Plums.....81 Apples.....82 Pears.....83 Peaches.....84 Lime.....851 Lemon.....852 Pomelo.....68 Jack fruit.....69 Durian.....97 Bilimbi.....98 Rambutan.....99 Bread fruit.....67 Malay apple.....38 Star fruit.....39 Custard Apple...200 God Fruit.....201 Mitobo.....202 Plum.....203 Peaches.....204 Pomegranate.....205 Date.....210 Tungamaa.....211 Vanilla.....212	Vegetables: Cabbage.....86 Tomatoes.....87 Spinach.....88 Carrot.....89 Chilies.....90 Amaranth.....91 Pumpkins.....92 Cucumber.....93 Egg Plant.....94 Water Mellon....95 Cauliflower.....96 Okra.....100 Fiwi.....101	Cash Crops: Cotton.....50 Tobacco.....51 Pyrethrum.....52 Jute.....62 Seaweed.....19	Permanent Cash crops: Sisal.....53 Coffee.....54 Tea.....55 Cocoa.....56 Rubber.....57 Wattle.....58 Kapok.....59 sugar Cane.....60 Cardamom61 Tamarind.....63 Cinnamon.....64 Nutmeg.....65 Clove.....66 Black Pepper....18 Pigeon pea.....34 Cassava.....21 Pineapple.....75 Palm Oil.....44 Coconut.....45 Cashew nut.....46 Green Tomato....300 Monkeybread....301 Bamboo.....302 Firewood/fodder..303 Timber.....304 Medicinal plant..305 "Fence tree".....306 other.....990
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S. Household Savings, Borrowing, and Shocks

	Name	Question	Response options/units	Notes/instructions
<i>Thank you. I would like to ask a few questions now about how your household manages expenses.</i>				
I1	Fin_credsource	In the past six months, has anyone in your household borrowed money?	1 Yes 2 No	If 2 >>> I3
I1.1	Fin_credfrom	Who did they borrow from?	9. COMMERCIAL BANKS 10. MICRO-FINANCE INST 11. VILLAGE COMMUNITY BANK (VICOBA) 12. NEIGHBOURS / FRIENDS 13. FAMILY 14. NGO OR SELF-HELP GROUPS 15. OTHER INFORMAL MONEY LENDER 16. OTHER, SPECIFY	If fin_credsource = yes
I2	Fin_amtbrw	In total, approximately how much has your household borrowed in the past 1.5 years?	TZ shillings	If yes to "has your household borrowed"
I3	Fin_wntloan	If you wanted to get a loan of to cover your expenses or buy farm inputs, do you think you or anyone in your household would be able to do that?	1 Yes 2 No 996 Don't know	

L. Wives/Partners Survey

L11	wives_part	Did you yourself participate in [ACTIVITY] in the past 12 months (that is, during the last [one/two] cropping seasons), from [PRESENT MONTH] last year to [PRESENT MONTH] this year? A) Food crop farming B) Cash crop farming C) Livestock raising D) Non-farm economic activities. E) Wage and Salary employment F) Fishing or fishpond culture	1 Yes 2 No	If emp_part==No -> skip to next activity. Activity:
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		G) Major hh expenditures H) Minor hh expenditures		
L12	wives_decision	When decisions are made regarding [ACTIVITY], who is it that normally takes the decision?	1. Self 2. Spouse 3. Both spouse and self (joint decision making) 4. Other HH member 5. Other Non-HH member 999. N/A	If emp_decision==1, skip to next activity. No response needed if activity==G or H.
L13	Wives_decisionfreq	When decisions are made regarding [ACTIVITY], how often does the decision maker inform you about the decision?	1 Always 2 Sometimes 3 Rarely 4 Never 5 Unsure	If emp_decision != 1 answer this
L14	wives_input	How much input did you have in making decisions about [ACTIVITY] in the past 12 months?	1. No input or input in few decisions, 2. Input into some decisions, 3. Input into most or all decisions, 98. No decision made/Not sure	If emp_input==98, skip to next activity
L15	emp_extent	To what extent do you feel you can make your own personal decisions regarding [ACTIVITY] if you want(ed) to?	1. Not at all, 2. Small extent, 3. Medium Extent, 4. To a high extent.	
L16	emp_use_inc	How much input did you have in decisions on the use of income generated from [ACTIVITY]	1. No input or input in few decisions, 2. Input into some decisions, 3. Input into most or all decisions, 98. No decision made/Not Sure	No response needed if activity==G or H.
L17	Wives_landlaw	Do you know about the national land laws?	1 Yes 2 Yes, but don't know the details 3 No	
L18	Wives_hearing	How confident are you that you would receive a fair hearing if you had a land dispute?	1 Very confident 2 Somewhat confident 3 Unsure 4 Not confident 5 Very unconfident	
L19	Wives_takepos	Do you think it's possible that someone could try to take one of your parcels from you without your permission, say in the next 5 years?	1 Yes 2 No	Enumerator should specify only the parcels in targeted commune if the respondent has parcels in other communes

				If 2 >>> L22
L20	Wives_expro	How likely do think it is that someone would try to take one of your parcels from you in the next 5 years?	1 Unlikely 2 Somewhat likely 3 Very likely/it is happening now	If wives_takepos = yes
L21	Wives_reason	Which if any of the following are reasons why you think this could happen? <ul style="list-style-type: none"> • Ongoing or past disputes or expropriation • Lack of documents • Length of agreement (if lease agreement for example) • Problems experienced by others in the community 	1 More important reason 2 Less important reason 3 Not a reason	If per_takepos = yes
L22	Wives_meet	How many group/village meetings have you attended in the past six months?	Enter number	
L22.1	Wive_meet_n	What kind of meetings have you attended?	7. Kitongoji Meetings 8. Village Meetings 9. Farmers' cooperative meetings 10. SACCOS or self-help group meeting 11. School meetings (SMC or parents) 12. Other	If wives_meet !=0
L22.2	Wives_meetfreq_n	How many times did you attend [MEETING]?	Enter number	
L22.3	Wives_speak	How many of those meetings have you spoken to the group?	Enter number	
L22.4	Wives_speakfreq	How many times did you speak at [MEETING]?	Enter number	If wives_speak != 0
L23	Wives_comfort	Do you feel comfortable speaking at village meetings or in group settings?	1 Yes 2 No	
L24	Wives_wgroup	Are there women's groups in the village or surrounding area?	1 Yes 2 No	If yes, continue If 2 >>> L26
L25	Wives_wattend	How many women's group meetings have you attended?	Enter number	If >0, continue
L25.1	Wive_totattend	How many women would you estimate were at the meeting?	Enter number	If many meetings (>10) were attended, this should refer to average.
L26	Wives_Lan_dcd_i	Who primarily decides how to use this household's parcel(s)?	1=Self 2 =Spouse	

			3=Both self and spouse together 4=Other male household member 5=Other female household member 990=Other, specify	
L27	Wives_Lan_inco_i	Who decides how to use any income generated from the use of this household's parcel(s)?	1=Self 2=Spouse 3=Both self and spouse together 4=Other male household member 5=Other female household member 990=Other, specify	
Next I'd like to ask about your household's experience with borrowing money or other items in the past 12 months.				
L28	Wives_loan	Over the past 12 months, did you or anyone else in this household borrow from someone outside the household or from an institution receiving either cash, goods, or services?	1 Yes 2 No	If 2 >>> L29
L28.1	Wive_loan_source	What was the source of the loan(s)?	8 COMMERCIAL BANKS 9 MICRO-FINANCE INST 10 VILLAGE COMMUNITY BANK (VICOBA) 11 NEIGHBOURS / FRIENDS 12 FAMILY 13 NGO OR SELF-HELP GROUPS 14 OTHER INFORMAL MONEY LENDER 991 OTHER, SPECIFY	Select all that apply
L28.2	Wives_loan_dec	Who made the decision to borrow from [SOURCE] most of the time?	6 SELF 7 SPOUSE 8 Both spouse and self (joint decision making) 9 OTHER HH MEMBER 10 OTHER NON-HH MEMBER 1000 NOT APPLICABLE	Select all that apply
L28.3	Wives_loan_decuse	Who makes the decision about what to do with the money/ item borrowed from [SOURCE] most of the time?	5 SELF 6 SPOUSE 7 Both spouse and self 8 OTHER HH MEMBER OTHER NON-HH MEMBER999 NOT APPLICABLE	Select all that apply

L28.4	Wives_loan_use	What did you use this loan/credit for?	10 SUBSISTENCE NEEDS 11 MEDICAL COST 12 SCHOOL FEES 13 CEREMONY/WEDDING 14 PURCHASE LAND 15 PURCHASE AGRIC. INPUTS 16 OTHER BUSINESS INPUTS 17 PURCHASE AGRIC. MACHINERY 18 BUY/BUILD DWELLING 99I OTHER(SPECIFY)	
L29	Wives_Lan_doc_i	Do you or your household have any kind of documentation of your rights to your HH's parcels?	1 Yes 2 No	If 2 >>> L3I
L29.1	Wives_Lan_typedoc_i	What kind of documentation? SELECT ALL THAT APPLY	6. GRANTED RIGHT OF OCCUPANCY 7. CERTIFICATE OF CUSTOMARY RIGHT OF OCCUPANCY 8. INHERITANCE LETTER 9. OTHER GOVERNMENT DOCUMENT 10. OTHER DOCUMENT OR LETTER (NON-GOVERNMENT/UNOFFICIAL)	If land_doc_i=yes next question
L29.2	Wives_Lan_docobtain_i	When did you obtain the documentation?	Year/Month	If wives_land_doc_i=yes next question
L29.3	Wives_Lan_docobtain_i	How many people have ownership rights under this documentation?		Enter number
L4I	Wives_CCRO	Have you heard of CCROs?	1 Yes 2 No	If 2 >>>Wives_LTA
L4I.1	Wives_payCCRO	In general, how much (if anything) would you be willing to pay to have one of your parcels surveyed and to receive a CCRO?		Enter amount in TShs.
L42	Wives_LTA	Have you heard of [LTA]?	1 Yes 2 No	If 2 >>> Next section. DO NOT PROMPT IF RESPONDENT HAS NOT HEARD OF LTA.

L42.1	Wives_LTArec	Which of the following did you receive through LTA?	<ul style="list-style-type: none"> • Land was surveyed • CCRO • Notarized title • None of the above 	If Wives_LTA= yes
L42.2	Wives_LTAimpr	What was your impression of LTA?	1 Very positive 2 Somewhat positive 3 Neutral 4 Somewhat negative 5 Very negative	If Wives_LTA = yes
L42.3	Wives_docyben	Do you believe that having documentation of your land rights through LTA benefits your household?	1 Yes 2 No	
L42.4	Wives_LTAcom	Do you think LTA has benefited your community in any of the following ways: <ul style="list-style-type: none"> • Protects against losing land • Protects against disputes with neighbors • Makes it easier to rent out • Makes it easier to sell • Will make inheritance easier • Other SELECT ALL THAT APPLY	3. YES 4. NO	If Wives_docyben = yes

ANNEX D: MEMO EXPLAINING RISKS TO RCT DESIGN FROM CHANGING EVALUATION TIMELINE

Options Memorandum: Impact Evaluation of the Land Tenure Assistance Activity in Tanzania

This memorandum was prepared at the request of the Office of Land and Urban in USAID's Bureau for Economic Growth, Education, and Environment (E3/LU). It summarizes two options for E3/LU's consideration for moving forward with the ongoing impact evaluation (IE) of the Feed the Future Tanzania Land Tenure Assistance (LTA) activity, given recent unanticipated changes in LTA activity implementation that present significant challenges for completing the IE as planned. The E3 Analytics and Evaluation Project ("the Project") is implementing the IE.

This memorandum begins with an overview of the LTA implementation changes, then summarizes the original IE design and timeline, the key methodological challenges created by the LTA implementation changes, the two options for proceeding with the IE given the LTA implementation changes, and updated estimated budget information for the IE. These two options are:

- **Option 1:** Adhere to the original, approved IE design but have all remaining IE activities occur six months earlier than planned, and take steps to ensure that the IE sample includes a full roster of villages as per the approved design.
- **Option 2:** Proceed with six-month accelerated IE timeline as in Option 1, but with a reduced sample of villages.

LTA Implementation Changes

On August 9th, USAID informed the Project team of two significant and unexpected changes in activity implementation based on recent decisions the implementation team had taken.

First, LTA intends to have implementation in its next set of target villages occur approximately five months earlier than previously discussed with the Project team. The change in the LTA timeline is being proposed after the Project team completed the first round of IE baseline data collection and analysis, and despite known challenges that such changes create for the IE, which the Project team has repeatedly stressed in conversations with the LTA implementation team over the past year.

Second, LTA and the Iringa District Land Office (DLO) have ruled out 8 of the remaining villages in the master list used to determine the IE sample, leaving 27 villages – which is below the minimum threshold that the IE design requires.

The Approved Timeline and Evaluation Design

The Project team's approved IE design, developed in coordination with USAID and LTA in 2016, is based on a cluster randomized controlled trial approach that has IE data collection taking place prior to LTA implementation in two phases, as shown in Table 29.

TABLE 5: APPROVED TWO-PHASE IE DESIGN AND LTA IMPLEMENTATION SCHEDULE

Phase	Implementation Year	Control	Treatment
1	2017-2018	15 randomly chosen villages do not receive LTA	15 randomly chosen villages receive LTA
2	2018-2019	15 randomly chosen villages do not receive LTA	15 randomly chosen villages receive LTA

The Project team completed Phase I baseline data collection in April 2017, randomly selecting 30 villages (and 2 buffer villages) from a list of 78 villages approved by LTA and the Iringa DLO. LTA, with input from the Iringa DLO, subsequently removed several villages from this list of 78 due to the potential challenges to LTA implementation, leaving 36 villages available for random assignment in Phase II. Per the approved IE design, Phase II baseline data collection – which also includes midline data collection for the Phase I households – was planned for March-April 2018, approximately one-year after the Phase I baseline.

LTA's decision to accelerate activity implementation would require that IE data collection for Phase 2 occur around late October 2017.

Methodological Considerations for the Options

One of the most important contributions of this IE is its rigorous design, since there have been few experimental studies on the impact of land formalization to date. Thus, the Project team sought to develop options in response to these LTA implementation changes that would preserve as much of the IE's rigor as possible. Three methodological considerations need to be kept in mind for each of the options presented:

- **Data Collection Timing:** All IE baseline data collection in Phase II villages must occur prior to LTA implementation activities in those villages, regardless of the timeline for implementation. Otherwise, the IE will not be able to estimate LTA's impact because it could not convincingly show that treatment villages would have been similar to the control villages had they not received the activity. Also, the Project team learned during Phase I baseline data collection that LTA started sensitization activities in two treatment villages prior to the IE baseline being conducted there. Going forward, it is critical that no additional implementation activities that involve LTA staff interacting with treatment villages take place before IE baseline data collection is completed.
- **Ability to Detect an Effect:** The IE design uses a panel survey, with respondents interviewed at the same time of year before, during, and after LTA implementation to rigorously estimate LTA's impact and compare it to villagers in the control group. The requirements to survey households at the same time of year and to conduct a midline survey of Phase I households are critical for the statistical power of the IE (i.e., its ability to detect an effect where one occurred). Changing the timeline for baseline data collection, and potentially reducing the number of villages included in the IE, would dramatically reduce the rigor of the IE design and increase the likelihood that the evaluation will not be able to detect any impact of the LTA interventions. While the IE can attempt to address the timeline change through statistical weighting and other approaches during analysis, any estimation of impact will be sensitive to the estimation methods beyond what was originally proposed and it is doubtful that the IE could make up for the loss of statistical power that would result from these implementation changes.
- **Bias:** The new LTA timeline will introduce bias into the responses of household survey respondents, given the very different survey contexts. Phase I baseline took place during the rainy season in Iringa District, but if baseline data collection for Phase II takes place in late October it would be the dry season in Iringa, during which village life and activities differ. The variance in responses between rainy and dry seasons, as well as the recall bias from people answering questions about spending, harvesting, and disputes, will also present estimation challenges during analysis. The IE's ability to control recall bias (e.g. respondents remembering with more precision their harvest amounts in October as compared to March), and even the perception of the survey at a different time of the year, are difficult to fully account for in the analysis and will likely limit the comparisons that can be made between the first and second baseline groups.

Option 1: Shifted Timeline, Full Village List

The first option identified by the Project team is to shift the timeline for Phase II baseline data collection from March-April 2018 to October-November 2017, as well as have the Project team and USAID work with LTA and the DLO to ensure that 30 villages are available for Phase II data collection and LTA implementation (i.e., 15 treatment villages and 15 control villages).

Option 1 still presents the following challenges and risks:

- **Bias from time-inconsistent responses:** Instead of collecting data from comparable groups at the same point in time in years one, two, and three of the study, the IE would have a full dataset of Phase I survey responses that are from a different context and limited in their comparability to Phase II.
- **Risk to power:** The ability to detect an effect based on the number of villages dictated by the IE design assumed that a panel survey would occur over three time periods (baseline, midline, and endline). The challenge for Option 1 is that period 1 and period 2 will differ in critical ways, namely that village life during the rainy and dry seasons is driven by different activities, and the gains to power by having three comparable periods of data collection may be diminished since the data may no longer be comparable due to seasonal differences. The Project team would need to conduct additional data simulation exercises to determine exactly what effect this will have on the IE's ability to detect an impact.

While Option 1 would not overcome the potential bias from time-inconsistent responses, it could allow for the IE to detect impact for outcomes where the effect size is large. Should USAID wish to proceed with Option 1, it is critical that the following occur:

- The Iringa DLO and LTA would need to agree to expand the village list for Phase II to a minimum of 32 villages (which includes two buffer villages should LTA encounter issues in the selected villages). Also, all villages must also be assigned to the treatment group at the same time; once villages have been assigned to treatment or control groups, they cannot be re-assigned nor can villages get added to the sample ex-post.
- The IE would still need to conduct the midline survey of Phase I villages, since the original IE design is based on collecting data from all villages at the same time of year over three phases. Thus, Phase II data collection in October-November 2017 would need to include a midline survey of all 750 households from the Phase I baseline, as well as a baseline survey of the additional 750 Phase II households.
- The IE team would need to revisit its survey instrument to ensure that reference points included in the original survey are consistent with the new timeframe (e.g., “in the past rainy season” previously referred to 2016, but respondents would likely reference the 2017 rainy season in October).

While Option 1 preserves as much of the rigor of the original IE design as possible given the LTA implementation changes, the internal validity of the IE would still be diminished because of the changing period for midline data collection for Phase I, which in the original IE design helped the IE's statistical power by increasing the number of observations and time periods of observation.

Option 2: Shifted Timeline, Diminished Village List

The second option identified by the Project team is similar to Option 1 and includes the same limitations, but entails greater risk and challenges as it would only use the current list of 28 remaining villages to randomly assign to treatment and control groups. Under Option 2, in October-November 2017 the IE would still conduct a midline survey of the Phase I villages and would survey the reduced number of villages as part of the Phase II baseline data collection.

Option 2 faces the following challenges:

- **Risk to power:** The IE would collect data on 58 instead of 60 villages, and it would require a minimum of a 21 percent change in outcomes between treatment and control under the original design.¹⁴¹ The IE's ability to detect an effect cause by LTA given the reduction in villages *and* the time change is difficult to estimate, and the Project team would need more time for further data simulation. However, it is unlikely that the IE would be able to reliably detect LTA's impact for outcomes that under the original IE design were already on the margins of being sufficiently statistically powered, such as women's empowerment outcomes.

The challenge with reducing the number of villages *and* changing the timeline is that any estimate of impact would be difficult to differentiate from random noise, become highly sensitive to variance in the data, and be highly contingent on researcher estimation techniques.¹⁴² Option 2 would, however, save time by not revisiting villages that were removed from the master list in mid-2016.

Further sensitivity to implementation issues: Option 2 leaves little to no room for further LTA implementation challenges and changes. If LTA encounters an issue in one of the randomly selected treatment villages and cannot fully implement there, the probability that the IE will be able to detect an effect for even the largest impacts will be significantly lower since there will be no buffer villages from which to choose.

¹⁴¹ Intra-cluster correlation coefficient: 0.05.

¹⁴² This is particularly an issue with studies that have poor or compromised designs, with little clear estimation strategy. See Gelman, Andrew and Eric Loken, "The garden of forking paths: Why multiple comparisons can be a problem, even when there is no "fishing expedition" or 'p-hacking' and the research hypothesis was posited ahead of time." *Department of Statistics, Columbia University* (2013).

ANNEX E: COMPARISON OF PHASE I AND PHASE II BASELINE DATA

Table 6 shows the overall Phase I and Phase II averages across baselines for selected key outcomes and household covariates. More respondents reported disputes during Phase I (n = 68), but there was a greater number of disputes overall reported in Phase II; several Phase II respondents reported having more than two disputes. The Phase II respondents report more household members on average, as well as a higher range of household members. Notably, education level, age, and cooperative membership were similar across both phases.

TABLE 6: COMPARISON OF PHASE I AND PHASE II BASELINE DATA

Variable	Phase II					Phase I				
	n	Mean	SD	Min	Max	n	Mean	SD	Min	Max
Age	1320	45.36	14.99	18	102	1179	47.27	16.08	18	101
Number of parcels owned	788	2.38	1.27	1	11	782	2	1.02	1	8
Parcel size (in hectares for all parcels owned)	788	3.8	6.77	0.1	74.66	1179	1.64	3.85	0	86.6
Cooperative membership (y/n)	788	0.23	0.42	0	1	782	0.2	0.4	0	1
Education level*	1320	0.85	0.47	0	3	782	0.88	0.52	0	4
Have you been faced with a situation when you did not have enough food to feed the household? (1=Yes, 0=No)	788	0.24	0.43	0	1	782	0.33	0.47	0	1
Possess land-related documentation (1=Yes, 0 = No)	1320	0.12	0.33	0	1	1179	0.15	0.36	0	1
Heard of CCROs	788	0.68	0.47	0	1	782	0.58	0.49	0	1
Number of household members	788	4.42	2.32	1	26	782	3.95	1.95	1	12
Experienced a dispute in the past year (1=Yes, 0 = No)	788	0.07	0.25	0	1	782	0.09	0.28	0	1
Number of reported disputes	52	1.19	0.63	1	5	68	1.09	0.29	1	2
Do you have familiarity with land laws (1=Y, 0=N)	1320	0.08	0.27	0	1	1179	0.03	0.18	0	1

*0 = No schooling, 1 = Primary, 2 = Form, 3 = University, 4 = Diploma

ANNEX F: RANDOMIZATION, BALANCE, AND POWER DISCUSSION

The IE randomization procedure was slightly different for the Phase I and Phase II sets of villages, thus introducing some divergence in design fidelity across the two phases. These differences are not considered a major limitation. Prior to Phase I, the IE team conducted a field reconnaissance trip to collect data on each village that could potentially be assigned to LTA treatment, with the aim of assuring context similarity. For the Phase II villages, no additional pre-selection data collection was done because the Phase II baseline data collection took place earlier than intended per the IE design due to a forward shift of LTA's implementation timeline and the incoming DAI chief of party felt there was sufficient ancillary information about the potential Phase II villages to work from.

In Phase I, randomization was based on data collected during field reconnaissance using a stratified random sampling approach. For Phase II, the IE team took a similar approach using data from the DLO to group villages into pairs based on the following strata: constituency, ward, population size, number of CCROs already issued in the village prior to the LTA intervention, and VLUP status. Villages were paired based on their similarity on these five criteria prioritized in the order shown above (e.g., ward takes precedence over similar VLUP status). From there, villages were randomly assigned within their paired grouping to either the treatment or control group. This approach helped improve the comparability of the villages across assignment groups. However, it was still important to test for statistical balance across the groups. This is because stratification only occurred across these five categories, some villages only had partial data (e.g., VLUP status was missing), and there were variables that may have affected the outcomes of interest but were not included in the DLO data, such as the presence of other interventions in the village.

The IE team found no major differences in key outcome variables between the two phases, despite the variation in the assignment procedure.

After baseline, the team conducted balance tests to assess and confirm the comparability of the treatment and control groups and to revisit the power calculations presented in the IE design proposal using updated parameters from the baseline data. On net, these checks confirmed balance across the LTA and control group sample on several key characteristics at baseline.

TESTING FOR BALANCE ACROSS TREATMENT AND CONTROL GROUPS

The baseline data provide a snapshot of the pre-intervention context and can be used to both test assumptions of the IE design and ensure that randomization occurred as intended. It is important to assess the balance between the treatment and control groups at baseline. If substantial differences in their characteristics exist, the control group may not be a valid representation of the counterfactual. While randomization in both assignment and survey respondent selection should theoretically increase the probability of balance between the treatment and control groups, it is important to test this assumption once data are collected to confirm the fidelity of the randomization procedure.

Researchers often use t-tests or regressions using treatment indicator variables to assess balance. However, no conceptual justification exists for using the statistical significance of such tests as a criterion for assessing balance.¹⁴³ The IE team used a normalized differences approach to assess balance between assignment groups. This method calculates a statistic based on the difference between the treatment and control group means, divided by the square root of one-half the sum of

¹⁴³ Douglas Altman, "Comparability of Randomised Groups," *Journal of the Royal Statistical Society: Series D (The Statistician)* 34, 1 (1985): 125-136; K. Imai, G. King, and E.A. Stuart, "Misunderstandings among Experimentalists and Observationalists in Causal Inference," *Journal of the Royal Statistical Society Series A* 171, 2 (2008): 481-502; P. Austin, "Using the Standardized Difference to Compare the Prevalence of a Binary Variable between Two Groups in Observational Research," *Communications in Statistics: Simulation and Computation* 38, 6 (2009): 1228-1234.

the treatment and control group variances. An absolute value greater than 1 for this statistic raises concerns, while an absolute value of 0.25 or less indicates particularly strong balance.¹⁴⁴ Normalized differences also help assess whether any potential imbalance can be addressed in the analysis phase. Table 7 shows the results of the normalized differences for 23 variables across 6 thematic areas. The IE team chose these variables to reflect a broad range of the outcome categories and covariates that the IE analysis used. These variables include household demographic characteristics; several measures of perceived tenure security; outcomes related to land disputes, women's empowerment, household wealth and economic outcomes; and several types of land-related investment. In no cases were large differences between the treatment and control group sample means observed. As the last column illustrates, the normalized difference statistic fell below 0.25 for all the variables, meeting the Imbens and Rubin standard for good balance. The IE team concludes, with a high level of confidence, that the treatment and control groups were well balanced, as would be expected given the randomized assignment between the two groups.

Note the higher standardized difference for one metric, driving miles to Iringa Town as a potential proxy for market access. This provides a general proxy of distance to the main economic hub in the district, but since road coverage estimation is inexact in much of rural Iringa and there are also smaller market centers in the district besides Iringa Town itself, it likely does not adequately reflect a respondent's actual access to markets.

¹⁴⁴ See Guido Imbens and Donald Rubin, *Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction* (Cambridge: Cambridge University Press, 2015).

TABLE 7: REVISITING BASELINE BALANCE PHASE I BASELINE

Variable		Treatment		Control		Normalized diff. sta
	N	Mean	SD	Mean	SD	
Demographics						
Female headed households, %	782	0.39	0.49	0.34	0.47	0.09
Household size	782	3.92	1.98	3.97	1.92	-0.03
Perceived Tenure Security						
Expropriation in next five yrs. is possible, %	782	0.10	0.30	0.07	0.25	0.12
Most/all in village worried about losing land, %	782	0.15	0.36	0.16	0.37	-0.05
Has documentation for at least one parcel, %	779	0.11	0.32	0.15	0.36	-0.11
Land Disputes						
Experienced land dispute in past year, %	782	0.10	0.30	0.08	0.27	0.07
Believe land disputes increased in past five years, %	782	0.17	0.38	0.16	0.37	0.03
Believe land disputes will increase in next five years, %	782	0.16	0.36	0.16	0.37	-0.01
Assets and Economic Outcomes						
Size of total land holdings, acres	782	5.17	6.68	6.03	12.74	-0.08
Household did not have enough to eat in past yr., %	782	0.35	0.48	0.30	0.46	0.12
Land-Related Investment: % of households making each land-related investment on at least one parcel						
Wells/irrigation, %	782	0.06	0.24	0.10	0.30	-0.13
Erecting buildings, %	782	0.54	0.50	0.58	0.49	-0.07
Erecting fencing, %	782	0.13	0.34	0.13	0.33	0.02
Terracing, %	782	0.31	0.46	0.35	0.48	-0.09
Soil conservation, %	782	0.46	0.50	0.46	0.50	0.01
Women's Empowerment (wives survey)						
Land use decisions make by male head of household only, %	397	0.35	0.48	0.38	0.49	-0.06
Attended village meetings in past yr., %	397	0.74	0.44	0.73	0.45	0.02
Comfortable speaking in village meetings, %	397	0.59	0.49	0.59	0.49	0.00

TABLE 8: REVISITING BASELINE BALANCE PHASE II BASELINE

Variable	Treatment			Control			Normalized diff. stat.
	N	Mean	SD	N	Mean	SD	
Demographics							
Female headed households, %	615	0.15	0.35	705	0.15	0.36	-0.01
Household head age	371	48.03	14.39	417	49.86	15.9	-0.12
Farmer cooperative membership	371	0.24	0.43	417	0.22	0.42	0.05
Annual household farm income (self-reported)	371	644406	4127285	417	555773	2195375	0.03
Education level for household heads and primary wives (0 = None, 1 = Primary, 2= Form, 3 = University)	615	0.86	0.46	705	0.85	0.48	0.03
Driving distance in miles to Iringa Town	570	30.98	15.23	657	27.59	12.8	0.24
Household size	371	4.48	2.49	417	4.37	2.16	0.05
Perceived Tenure Security							
Expropriation in next five yrs. is possible, %	371	0.07	0.25	417	0.04	0.2	0.11
Most/all in village worried about losing land, %	371	0.11	0.31	417	0.1	0.29	0.03
Has documentation for at least one parcel, %	615	0.11	0.31	705	0.14	0.34	-0.10
Land Disputes							
Experienced land dispute in past year, %	371	0.08	0.26	417	0.06	0.23	0.07
Believe land disputes increased in past year, %	371	0.14	0.35	417	0.12	0.33	0.05
Believe land disputes will increase in next year, %	371	0.12	0.33	417	0.11	0.31	0.04
Assets and Economic Outcomes							
Size of total landholdings, acres	371	10.42	19.97	417	8.45	13.15	0.12
HH did not have enough to eat in past yr., %	371	0.27	0.44	417	0.21	0.41	0.13
Land-Related Investment: % of households making each land-related investment on at least one parcel							
Wells/irrigation, %	371	0.05	0.21	417	0.06	0.23	-0.04
Erecting buildings, %	371	0.23	0.42	417	0.17	0.38	0.15
Erecting fencing, %	371	0.05	0.22	417	0.06	0.24	-0.05
Terracing, %	371	0.2	0.4	417	0.17	0.38	0.07
Soil conservation, %	371	0.26	0.44	417	0.21	0.41	0.12
Women's Empowerment (wives survey)							
Land use decisions made by male head of household only, %	244	0.19	0.4	288	0.14	0.35	0.14
Attended village meetings in past yr., %	244	0.83	0.38	288	0.8	0.4	0.07
Comfortable speaking in village meetings, %	244	0.58	0.49	288	0.65	0.48	-0.14

REVISITING POWER ASSUMPTIONS WITH PHASE II BASELINE DATA

The IE team also used the baseline data to revisit the power calculations presented in the IE design proposal to improve their accuracy and to reassess the IE's expected statistical precision. In many IEs, power calculations are used to determine the minimum sample size required for the desired level of statistical power. In the case of the LTA IE, however, the sample size was constrained by LTA implementation being limited to 30 villages (clusters), which was the fixed scope of LTA's intervention. Thus, the focus of the power calculations was to estimate the anticipated minimum detectable effect size¹⁴⁵ for different outcomes given the sample size.

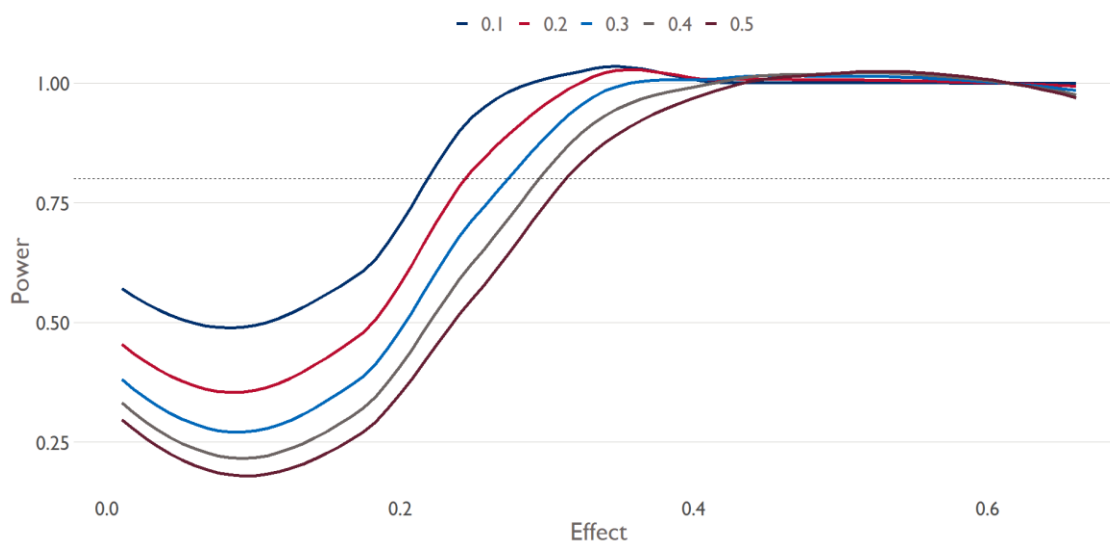
To revisit the minimum detectable effect size, the IE team used standard assumptions of 80 percent power and a 0.05 statistical significance level. Power is the probability of detecting an effect where one actually exists (i.e., a true positive); a value of 80 percent or higher is generally considered sufficient. The IE team used cluster sizes and intra-cluster correlation values obtained at baseline for a range of outcomes of interest, together with other updated sample parameters, to obtain updated estimates of the IE's power to detect policy-relevant magnitudes of change for the outcomes of interest.

In addition to assuming a significance level of 0.05, the IE team simulated power assuming a binary outcome with the following additional assumptions:

- An intra-cluster correlation ranging from 0.1 to 0.5
- 60 total clusters
- Treatment effects ranging from 0 to 0.66

Figure 43 shows the updated power curves for the IE at endline. The IE design proposal concluded that the analysis was likely to be sufficiently powered for most outcomes, but that outcomes for which the intra-cluster correlation was greater than 0.10 and/or for which the magnitude of impact would be small (effect size less than 0.2 standard deviations from the mean), the IE would be statistically underpowered. Being underpowered means the IE would run a substantial risk of finding no impact even if LTA did, in fact, have some impact on these outcomes.

FIGURE 43: ENDLINE POWER CURVES



¹⁴⁵ The minimum detectable effect size is an estimate of the smallest change in the outcome of interest that is detectable based on other sample parameters, such as the desired statistical significance (alpha) level, the intra-cluster correlation, the sample mean and variance, and the size of clusters.

For several measures, such as perceived land tenure security which has a low intra-cluster correlation of around 0.04, the power results suggest the IE could reliably detect a smaller effect. The Phase I baseline report provided a table of intra-cluster correlations for each outcome measure, which ranged from 0.04 as noted on tenure security outcomes to around 0.10 to 0.20 for dispute and investment outcomes. As many have noted, power estimates only provide a broad understanding of the extent to which a study of a given size may be reasonably able to statistically detect a true effect of a given size.¹⁴⁶ In some cases, the incidence of the outcome is so low that it takes a large effect size to measure any effect. For example, the dispute prevalence in the sample was underpowered given that there were few actual reported disputes in the survey data and little difference between assignment groups.

¹⁴⁶ See Andrew Gelman and Jennifer Hill, *Data Analysis Using Regression and Multilevel/Hierarchical Models* (Cambridge: Cambridge University Press, 2006), 442. Also, Daniel J. O'Keefe, "Brief Report: Post Hoc Power, Observed Power, A Priori Power, Retrospective Power, Prospective Power, Achieved Power: Sorting Out Appropriate Uses of Statistical Power Analyses." *Communication Methods and Measures* 1, no. 4 (2007): 291-299. Esther Duflo, Rachel Glennerster, and Michael Kremer. "Using Randomization in Development Economics Research: A Toolkit," *Handbook of Development Economics* 4 (2007): 3895-3962.

ANNEX G: KEY INFORMANT INTERVIEWS CONDUCTED AT ENDLINE

TABLE 9:ENDLINE KEY INFORMANT INTERVIEWEES

Stakeholder Group	Interview Date	Respondent Gender
LTA	6/29/2020	Male
LTA	7/21/2020	Male
DLO-Iringa	8/10/2020	Male
DLO-Iringa	8/11/2020	Male
CDO-Iringa	8/11/2020	Female
DLO-Iringa	8/13/2020	Male
CDO-Iringa	8/13/2020	Female
CDO-Iringa	8/12/2020	Female
Ministry of Lands, Housing, and Human Settlements Developments	8/19/2020	Female
Ministry of Lands, Housing, and Human Settlements Developments	8/21/2020	Male
Ministry of Lands, Housing, and Human Settlements Developments	8/19/2020	Female
DLO-Iringa	8/18/2020	Male

ANNEX H: ENDLINE DATA COLLECTION DETAILS

Endline data collection was accomplished by seven field teams, each consisting of four enumerators and a field supervisor. When possible, enumerators worked in pairs, with one enumerator interviewing the male head of household and another the primary wife or spouse of household head. When both male and female respondents were available from a given household, enumerators sought to interview female respondents independently from male respondents, and outside of hearing range (for example, interviewing the female respondent inside the home while the husband was interviewed outside of the home). In some cases, only one member of the household was home and available for survey, due to farming or market activities. In those cases, the team surveyed only one household member.

At endline, the survey team revisited households that were randomly selected for interviews during the previous data collection rounds. While no new households were added to the sample at endline, at times new respondents within the existing panel of households were added to the sample when either of two conditions occurred:

- A spouse or household head who was absent during the previous rounds but was present and willing to participate in the survey during endline.
- The spouse of a respondent had passed away or left the village between data collection rounds, in which case the new spouse was interviewed.

The remoteness of the study area villages and the fact that many household members were unavailable at certain parts of the day due to farming activities meant that enumerators often made follow-up visits to the selected households. The survey team made follow-up visits to households in the following situations:

- When there was no one in the household at the time of initial (first and second) visits.
- When there were no adult household members/target respondents at the time of the visit.
- When the target respondent(s) were busy at the time of the initial visit and requested that enumerators come back later.
- When the enumerators were not able to complete one or all of the household interviews during their previous visit, but it was still possible for them to return later.

Informed consent was required for all household interviews. If a respondent refused to be interviewed or decided they did not want to continue midway through the interview, the enumerator would then conclude the interview.¹⁴⁷

The IE team implemented standard quality control measures for endline data collection, consistent with the same approaches used in previous survey rounds. At endline, a total of 1,488 data quality control checks took place, including 1,061 sit-ins, 420 back checks, and seven call backs.¹⁴⁸

Prior to the start of endline data collection, the IE team's evaluation coordinator and local coordinator, along with the field supervisor and eight enumerators, implemented a pretest for the endline survey in Kinyali village in Iringa District. The goal of the pretest was to refine the relevance, sequencing, and wording of survey questions, as well as ensure that the mobile platform accommodated the correct skip patterns and logic checks in the survey.

¹⁴⁷ In addition to informed consent obtained from all respondents, the IE went through human subjects research ethics approval via NORC's institutional review board at baseline. USAID determined that additional in-country ethics approval was not required for this evaluation.

¹⁴⁸ Sit-ins include a field supervisor being present for the entire interview. Back checks consist of supervisors randomly re-interviewing respondents on select survey items to ensure accuracy. Call backs were conducted by contacting respondents via mobile phone to ask about select survey items and to ensure accuracy.

TABLE 10: SURVEY QUESTIONNAIRE MODULES

Modules		Indicators
I.	Household Roster and Information	<ul style="list-style-type: none"> • Age, schooling, marital status • Household size, number of adults and children • Economic activity
II.	Agricultural Organization, Services	<ul style="list-style-type: none"> • Farmer cooperative involvement • NGO activity involvement
III.	Landholdings and Characteristics	<ul style="list-style-type: none"> • Parcels owned and rented, parcel size, documentation status • Parcel acquisition method, inheritance, planning • Irrigation, fallowing, and parcel improvements
IV.	Agricultural Production—Annual Crops	<ul style="list-style-type: none"> • Parcels cultivated, crops grown by parcel, tools used • Seeds planted, amount paid for seeds • Use of inputs (e.g., fertilizer), cost of inputs, use of hired labor • Amount harvested, quantity sold, income from sales
V.	Agricultural Production—Perennial Crops	<ul style="list-style-type: none"> • Parcels cultivated, crops grown by parcel • Use of intercropping • Trees planted, planned use for trees • Amount harvested, quantity sold, income from sales
VI.	Perception of Land Rights	<ul style="list-style-type: none"> • Expropriation • Land tenure security • Knowledge of land laws, LTA, and CCROS
VII.	Land Disputes	<ul style="list-style-type: none"> • Dispute incidence • Nature of disputes • Dispute resolution
VIII.	Non-Agricultural Income, Consumption, and Assets	<ul style="list-style-type: none"> • Asset inventory • Livestock inventory • Household construction materials • Formal, non-farm employment
IX.	Household Savings, Borrowing, and Shocks	<ul style="list-style-type: none"> • Borrowing amount and lender • Household shocks
X.	Food Security	<ul style="list-style-type: none"> • Incidence of food insecurity in the past 12 months
XI.	“Wives Survey”	<ul style="list-style-type: none"> • Demographic information, education level • Expropriation in the event of husband's death • Income activities, decision making, disputes • Borrowing • Familiarity with land laws, LTA, and CCROs

ANNEX I: ADDITIONAL INFORMATION ON EXISTING LITERATURE AND RESEARCH GAPS

The evidence base on the impacts of land tenure interventions based on randomized designs – widely recognized as the “gold standard” in IE research – is virtually non-existent. The only published study of which the IE team is aware is a preliminary analysis of the short-term impacts of a Millennium Challenge Account-funded intervention in Benin by Goldstein et al (2015). That study found that the program to regularize tenure led to an increase in the propensity to invest in longer-term cash crops and a reduction in gender disparities for female land holders. In addition to follow-up work on that study, there is an ongoing experimental study of the USAID Tenure and Global Climate Change activity in Zambia conducted by the Cloudburst Group. The LTA IE thus helped fill an important gap in the evidence base on land tenure interventions.

Secure property rights over land is widely recognized as a necessary precondition for economic growth and development (Coase 1960, North 1981). Where property rights are incompletely defined or poorly enforced, the consequent risk of land expropriation or dispute can undermine incentives to accumulate and invest. There is substantial literature documenting the existence of insecure land rights and associated disputes in a variety of developing country contexts, including rural areas in sub-Saharan Africa (e.g. Derman et. al. eds. 2007). As a result, improving the security of land rights has long been on the agenda of both donors and developing country governments. A wide range of related interventions has been carried out, including formalization programs to issue land titles or other documents, policy reforms, and institutional capacity building.

Despite widespread recognition of the importance of strengthening land rights in rural contexts, the evidence base is limited. A systematic review by Lawry et al (2014) brought together the existing evidence on the efficacy of land rights interventions in terms of stimulating agricultural investment and productivity. Following an exhaustive search process, the review identified only 20 papers that used rigorous quantitative methods to measure the impact of land tenure programs, none of which were RCTs. These papers tended to find positive impacts overall, though with some variability, and highlighted the importance of contextual factors in mediating the relationship between land tenure interventions and agricultural outcomes. The authors concluded that “the available evidence provides a weak basis for establishing the general effectiveness of land tenure programs” (p. 69).

In addition, there is a substantial literature that casts doubt on the efficacy of land titling programs to lead to broader economic impacts. For example, Hombrados, et al (2015) used household surveys from the National Bureau of Statistics in Tanzania to estimate the impact of land titles on investment using a propensity score matching model. That study and others like it¹⁴⁹ found that titles had no effect on investment or tenure security. Unlike recent efforts such as LTA, the earlier formalization efforts generally did not involve participatory approaches and careful attention outreach.

Strengthening property rights can improve economic outcomes along a number of channels, depending on the context. For example, issuing titles to urban squatters has been shown to lead to improved educational outcomes and foster more market-oriented beliefs (Galliani and Schargrodsky 2004). Another frequently cited benefit is the potential for formal property documents to be used as collateral for loans, thereby improving access to credit (see Feder and Feeney 1991, Besley 1995, and de Soto 2000). In rural contexts in particular (such as the area in which the LTA activity was implemented), a key justification for strengthening property rights to land was to strengthen incentives to make investments that are long term or fixed in land, and thus boost agricultural productivity and lead to more environmentally sustainable practices.

¹⁴⁹ For example Kenya (Migot-Adholla 1994), Madagascar (Jacoby and Minten 2007), and elsewhere in Africa and South America (Benjaminsen et al 2009).