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# **USAID/Ethiopia Land Tenure Administration Program (ELTAP) and Ethiopia Land Administration Program (ELAP)**

**Impact Evaluation Design**

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### **DISCLAIMER**

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

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# ACRONYMS AND ABBREVIATIONS

DfID	Department for International Development
EEA	Ethiopian Economic Association
ELAP	Ethiopia Land Administration Program
ELTAP	Ethiopia Land Tenure Administration Program
ERC	Evaluation, Research and Communication
GIS	Geographic Information System
GoE	Government of Ethiopia
GPS	Global Positioning System
HH	Household
IE	Impact Evaluation
IRB	International Review Board
LIFT	Land Investment for Transformation
LTD	Land Tenure Division
NGO	Non-governmental Organization
REILA	Responsible and Innovative Land Administration
RFP	Request for Proposal
SIDA	Swedish International Development Cooperation Agency
SNNP	Southern Nations Nationalities and Peoples
SWC	Soil and water conservation
USAID	United States Agency for International Development

# I.0 INTRODUCTION

This document describes an impact evaluation (IE) for the USAID-supported Ethiopia Land Tenure Administration Program (ELTAP: 2005-2008) and the Ethiopia Land Administration Program (ELAP: 2008-2013). The evaluation will focus on second level land certification activities under ELTAP and ELAP and the impact these have had on rural households. This work is being conducted under the Evaluation, Research, and Communications (ERC) Task Order # AID-OAA-TO-13-00019 for USAID.

Following decades of insecurity marked by conflict, famine, regime change, and land redistribution, starting in the late 1990's the Government of Ethiopia (GoE) embarked on an ambitious program to document and register lands held by rural households in an effort to increase their tenure security and certify their long-term use rights. Ethiopia's "first level" land certification program has been hailed as one of the most successful low-cost land registration programs in Africa and elsewhere, and research to date suggests that first level certification has had a positive impact on a variety of economic outcomes (Deininger, Ali, & Alemu, 2011; Hagos & Holden, 2013; Holden, Deininger, & Ghebru, 2009, 2011; Holden & Ghebru, 2013).

Despite being an extremely important step in strengthening the tenure security of rural farmers, first level certification had a number of shortcomings that prevented this from being a viable long-term solution (Bezu & Holden, 2014). To help address these issues, USAID began working with the GoE to support "second level" land certification starting with ELTAP (2005-2008) and continuing under ELAP (2008-2013). In supporting second level land certification activities, ELTAP and ELAP piloted the use of handheld GPS devices to map and demarcate parcel boundaries, a key component of land administration systems that was not part of the first level activities.

The GoE is planning to significantly scale-up second level certification using its own resources and support from its development partners, including through the UK's Department of International Development (DFID) Land Investment for Transformation (LIFT) Programme, the Responsible and Innovative Land Administration (REILA) project supported by Finland, and the Sustainable Land Management Program II supported by the World Bank. These efforts will be considerably larger in scale than USAID's ELTAP and ELAP programs, despite these having been the largest programs to date. Although the GoE will be using a system for delineating boundaries based on imagery, rather than handheld GPS, as was used for ELTAP and ELAP, there is a lack of information on the impact second level certification has over first level certification.

To help fill this gap in information and understanding and better inform future policy, this evaluation will focus on measuring the impact of second level land certification in comparison to first level land certification, which has already reached the majority of rural smallholders in the Highland regions (Amhara, Oromia, Southern Nations Nationalities and Peoples, and Tigray). In the context of the larger policy dialogue and in answering the question "how secure is secure enough?" the overarching question that underlies and motivates this evaluation is:

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

Following from the broad objective of measuring increased tenure security, a number of ancillary questions help frame the broader policy discussion and inform a range of land tenure issues. In particular, USAID and the GoE have expressed interest in the following evaluation questions:

- Q-I. Does the added expense of second level land certification as compared to first level certification provide additional land tenure security benefits at least equal to the difference in cost between the two certification methodologies? Another way to state this is: Are the marginal benefits of second level certification greater than the marginal costs as compared to first level certification?
- Q-II. How, if at all, have first level vs. second level land certificates been used as proof of ownership (e.g. for obtaining micro-loans, resolving land disputes, or resolving challenges to their land claim)? If they have not been used, why not?
- Q-III. Are there differences between land that has first vs. second level certification in the number and types of transactions that are recorded in the registries at the *woreda*/regional level? If so, which transactions and why are these transactions not being formally recorded?
- Q-IV. How do beneficiaries, including landholders and local government officials, perceive the value of first and second-level certifications?
- Q-V. What factors explain the large gap between the number of households surveyed/registered and those that actually received their land certificates?
- Q-VI. Has second level land certification affected intra-household welfare relative to first level land certification?

These questions can be classified as being: a) process oriented - relating to the performance and efficiency with which the programs were delivered (i.e. Q-III and Q-V); b) impact oriented – referring to changes in livelihood and economic well-being of beneficiaries targeted by the intervention (i.e. Q-II and Q-VI); or c) combined process and impact – combining aspects that are oriented with program processes like the cost of service delivery with development outcomes like change in household income which is impact oriented (i.e. Q-I and Q-IV). This evaluation is mainly concerned with assessing the impact of second level certification and thus focuses on Q-I, Q-II, Q-IV, and Q-VI, which are used in specifying a series of testable development hypotheses.<sup>1</sup>

What follows in this report includes an exploration of the theoretical underpinnings of ELTAP/ELAP, a review of the literature surrounding second level land certification and tenure security, a detailed list of key research hypotheses to be tested, a presentation of the survey instruments and data management design, and the proposed timeline and schedule of deliverables. The evaluation will provide an evidence base for improved policy making and programming by testing the development hypothesis that second level land certification increases tenure security and improves rural livelihoods compared to first level.

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<sup>1</sup> Although this evaluation will not address those process oriented questions and components directly, to allow for that possibility at a later date, additional information on plot-level land transactions (i.e. permanent transfer of ownership and temporary leasing/rental activity), whether or not these are registered with the *woreda* land administration office, and the associated costs (implicit and explicit) are included as part of the endline household questionnaire. This additional information will be included in the final evaluation report as descriptive statistics and may facilitate undertaking a performance evaluation. If additional funding becomes available, a performance evaluation methodology could be used to address Q-III and Q-V.

## 2.0 BACKGROUND

### CONTEXT FOR LAND TENURE INSECURITY

Consecutive national governments in Ethiopia have implemented differing approaches to land administration. The imperial regime of Haile Selassie (pre-1975) allocated land ownership to political supporters without regard to its occupation or use by farming populations. This created a feudal regime of landholdings in much of the country, with many farmers operating tenancies on lands held by absentee landlords (USAID, 2011). Upon the overthrow of the monarch in 1975 by the Derg regime, the Proclamation of March 1975 declared land to be the collective property of the people. Between 1976 and 1991, the Derg regime implemented a series of reforms in which the system of tenancy and elite rule was abolished, and all previously privatized land was redistributed to farmers (Adgo, Selassie, Tsegaye, Abate, & Ayele, 2014). The Derg regime also repeatedly redistributed land every year or two with the aim of achieving an equitable allocation of usufructuary rights. Yet, as a result, these frequent redistributions reduced land access and undermined secure ownership of land and natural resources (USAID, 2011).

After the fall of the Derg regime in 1991, the transitional government of Ethiopia announced the continuation of the land policy of the Derg regime. In 1995, state ownership of land was instituted in Ethiopia's new constitution, which prohibits private ownership of land and affirms that the right to ownership of rural and urban land, as well as all natural resources, is exclusively vested in the State and in the peoples of Ethiopia (USAID, 2011). In 1997, the last official redistribution in Amhara Regional State was declared and undertaken (Desta, Kassie, Benin, & Pender, 2000), and in the same year a land law was introduced giving legislative power to the Federal Government but delegating implementation to the Regional States (Adgo et al., 2014). In 2002, the government delegated greater legislative powers to the Regional States in matters related to land administration, including authorities that provided the legal basis for land certification activities (Adgo et al., 2014). Current land policy allows rural households to legally lease their land and engage in sharecropping and lending of land for limited periods; although, buying, selling, and mortgaging land are still prohibited (Adgo et al., 2014).

### FIRST AND SECOND LEVEL LAND CERTIFICATION

Beginning with Tigray in 1998, the Government of Ethiopia embarked on a rural land registration program to increase the tenure security and certify the long-term use rights of rural households. Followed by Amhara in 2002 and Oromia and the Southern Nations Nationalities and Peoples (SNNP) regions in 2004, Ethiopia's first level land certification program has been hailed as one of the more successful and cost effective land registration programs in Africa and elsewhere. The estimated cost of Ethiopia's first level certification is reported to be approximately US\$1 per parcel (Alemu, 2006;



Deininger, Ali, Holden, & Zevenbergen, 2008; Land Equity International, 2006)<sup>2</sup>. In addition to being considered one of the least costly land registration programs in Africa and elsewhere (Deininger et al., 2008), Ethiopia's first level land certification program was impressive in how quickly it was scaled up and the large number of households that were covered in a relatively short period of time. By the mid-2000s, approximately 20 million plots were registered from 6 million households (Deininger et al., 2008), with upwards of 12 million households covered by the end of the decade (Hailu & Harris, 2013). To date, the Ministry of Agriculture's Land Use Directorate estimates that 90% of farming households have first level land certification (MoA, 2013). Often associated with the 'green books'<sup>3</sup> issued to households as a record of their land holdings and rights, research to date suggests that first level certification has had a positive impact on a variety of economic outcomes. Among the key findings are increased investment and land productivity (Holden et al., 2009), increased land rental market activity (Deininger et al., 2011; Holden et al., 2011), as well as increased women's participation in land market activity and even improved child nutrition (Holden & Ghebru, 2013).

Despite being an extremely important step in strengthening the tenure security of households who had been subjected to the uncertainty of land redistribution in the previous decades, first level certification is not generally viewed as being viable for the long-term as a result of some key shortcomings (Bezu & Holden, 2014). Chief among these limitations is that the first level certification process did not map individual plots or provide the level of spatial detail documenting boundaries that would allow for the development of cadastral maps for improved land use management and administration. The lack of computerized land registries further complicates the management and updating of registration records. To incorporate the necessary geographic information system (GIS) detail, generate parcel maps, computerize land records, and strengthen rural land administration system in general, the Government of Ethiopia (GoE) has been working with USAID and other development partners, including the Swedish International Development Cooperation Agency (SIDA), the World Bank, the United Kingdom's Department for International Development, and the Government of Finland under the Responsible and Innovative Land Administration Project (REILA) to explore alternative approaches to "second level land certification." The GOE plans to provide second level certification to an estimated 50 million land parcels (Hailu & Harris, 2013), and there is considerable interest by GoE and donors for research and analysis to assess and understand the impact second level certification will have on rural households and the functionality of the land administration system in general.

## **USAID SUPPORT TO SECOND LEVEL LAND CERTIFICATION**

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

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<sup>2</sup> By comparison, low-cost estimates for land titling in West Africa are in the range of US\$7-10 per parcel (Lavinge-Delville, 2006). Depending on the scale at which titling is taking place, in Madagascar the costs of issuing titles on an on-demand-basis range from US\$150 to US\$350 per parcel (Jacoby & Minten, 2007; Teyssier, Raharison, & Ravelomanantsoa, 2006), with low-cost estimates under a systematic approach in the range of US\$7-28 per parcel (World Bank, 2006). In Uganda, the cost of issuing customary land certificates is US\$40 per parcel (Deininger et al., 2008). Outside of Africa, the cost of first time registration ranges widely from of \$US10-13 per parcel (in Moldova and Peru respectively) to over US\$1,000 on the high-end (\$1,064 for Trinidad and Tobago and \$1,354 in Latvia) (Burns, 2007).

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

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

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

The main objective of ELAP was to assist the GoE to strengthen and enhance rural land tenure security and land administration, also through four components (USAID, 2013):

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

Under ELTAP, second land certification was covered under Component 1, whereas under ELAP, it was covered under Component 2. Despite the different labels, the two components were substantively similar. ELAP used the same methods as ELTAP for mapping parcels, which involved recording parcel boundaries based on readings taken with handheld GPS devices. One important distinction between the two deals with the areas targeted for second level activities. Under ELAP, certification efforts were focused only on those areas with high agricultural production and investment potential. The extent to which ELTAP and ELAP may have had differential impacts on key outcome indicators can be addressed in the analysis strategy and incorporated into the empirical model appropriately (i.e. through the use of indicator or interaction variables).

Under ELTAP, second level cadastral surveying and registration of rural land started in Amhara and Oromia regions during the first quarter of 2007, followed by Tigray and SNNP regions in the second quarter. Through the end of May 2008, a total of 147,449 households were visited from six *woredas* in each region - 24 in total. Over the course of ELTAP, the boundaries of 704,754 parcels were mapped using GPS devices and registered with the land administration office. By the end of the program, approximately 56% of these parcels had been formally issued a certificate.

Land certification under ELAP was to continue in each of the four regions using the methodologies developed under ELTAP but targeting areas with high potential for agricultural production and investment. The criteria to identify high value areas to focus further second level certification activities were (USAID, 2013):

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

**TABLE 1: CERTIFICATION UNDER ELTAP AND ELAP**

Year	Program	Number of Households	Parcels	
			Registered and Surveyed	Certificates Issued
2005	ELTAP	-	-	-
2006	ELTAP	-	-	-
2007	ELTAP	102,497	494,989	-
2008	ELTAP	44,952	209,765	396,017
Sub-total		147,449	704,754	396,017
2009	ELAP	10,613	12,101	-
2010	ELAP	33,523	52,047	-
2011	ELAP	38,685	79,068	88,766
2012	ELAP	-	-	103,418
Sub-total		82,821	143,216	192,184
Grand Total		230,270	847,970	588,201

**NOTE:** The total number of certified parcels under ELAP, 192,184, is higher than the number of parcels registered, 143,216, because it includes parcels registered and surveyed under ELTAP but certified under ELAP.

Source: (USAID, 2008, p. 13 Table 3.4, 2013, p. 24 Performance Indicators)

Officials in Amhara Region decided not to participate in the certification components of ELAP (USAID, 2013 p. 18). In the end, a subset of *kebeles* (villages) from *woredas* in three of the regions participated in the certification activities under ELAP: four in Oromia and two in each of SNNP and Tigray. Over the course of ELAP, 143,216 parcels were registered and surveyed while 192,184 parcels were certified. The number of parcels certified under ELAP exceeds the number surveyed and registered since the number certified includes parcels surveyed under ELTAP but which received certificates under ELAP.

# 3.0 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Using the above research questions as a starting point, the literature review is organized into four themes: i) agricultural investment and productivity; ii) land transactions and access to financing; iii) disputes and conflict; and iv) land management and soil conservation. This review focuses primarily on the state of research as it applies to Ethiopia. A recent review covering similar topics with a more extensive review of the literature can be found in the ELAP baseline data report (Ethiopian Economics Association, 2013).

## INVESTMENT AND AGRICULTURAL OUTCOMES

A basic premise of stronger and more secure land tenure is that the enforcement of these rights lessens the risk of landholders being forcibly displaced and allows for a level of long-term security and a sense of permanence that encourages land-related investment (Besley, 1995). Although secure tenure alone is not sufficient to induce investment, it is a necessary condition for individuals to undertake long-term investments by giving them a sense of permanence and security. Numerous studies have demonstrated the positive impact greater land tenure security has on agricultural outcomes and investment in rural land (Deininger et al., 2011; Deininger & Chamorro, 2004; Feder, Chalamwong, Onchan, & Hongladarom., 1988; Holden et al., 2009; Jacoby, Li, & Rozelle, 2002; Rozelle & Swinnen, 2004). In Ethiopia, research to date suggests that first level land certification increased investment at the individual, as well as the community level (Deininger et al., 2008; Holden et al., 2009) and that farms with certified land tend to be more productive than those that are not (Ghebru & Holden, 2008). The higher productivity is attributed to the use of better inputs, such as superior cultivars, pesticides, and synthetic fertilizers.

## LAND TRANSACTIONS AND ACCESS TO FINANCING

The land policy at the time of first level land certification allowed rural households to legally rent out their land (Adgo et al., 2014). Empirical research has shown that activity in land rental markets increased as a result of the introduction of first level certification (Deininger et al., 2011; Holden et al., 2011). Since land leasing was already permitted under the first level program, it is unclear whether second level land certification will lead to increased rental activity. Despite being legally permissible prior to second level certification, the additional information on specific parcel details, notably the size of the parcel and a map of the boundaries, could potentially reduce information asymmetries between renter and lessee by verifying key information, thereby allowing the parties to enter into a contract (formal or informal) that might not otherwise have taken place. Second level certification is also expected to increase the tendency for widows and women-headed households to engage in renting and sharecropping activity. Prior to receiving certification, women often limited such activity to relatives out of concern that the

renter/sharecropper might claim the land use right as his own after establishing use for several years. Certification provides women with additional reassurance and documentation of their rights and, as a result, is expected to increase women's tendency to engage in these types of short-term, temporary transfer of rights to non-relatives.

Although some land transactions, such as renting/leasing and sharecropping, are allowed, this does not apply to buying, selling, or mortgaging of land, which are still illegal. Although land cannot be used as collateral to secure a loan, research does support that informal financial institutions can be an effective alternative in supporting smallholder credit access to promote investment in new technologies. Informal means, such as financing provided collectively by a local group and using norms of social accountability as an enforcement mechanism, is one such model (Knox, Meinzen-Dick, & Hazell, 2002). Indeed, in Ethiopia, there is evidence that issuance of second level certificates makes it easier for small landholders to obtain micro-financing. One common mechanism for securing such loans is group lending, which is based on the principle that all members of the group are liable to repay the loan in the event one of the members defaults, thus providing security to the lender. Groups have adopted a practice where each member deposits their second level certificate with the group in order to join. Instances of this type of activity include Halaba woreda, SNNP Regional State and the Rift Valley of Oromia Regional State (USAID, 2013). Rather than being used as collateral in the formal sense – such that a bank could repossess land used as collateral on an unpaid loan – credit is being accessed through informal mechanisms, where the land certificate is *de facto* collateral – showing the capacity and ability for repayment – and the lender relies on group pressure or other extra-legal means for enforcement. Second level certificates may also facilitate access to credit by reducing the transaction costs associated with obtaining credit. By using the certificate as a means to verify information, such as plot size, on a loan application, microfinance agencies are able to reduce the time and effort required to process applications (Mola, 2011).

## **DISPUTES AND CONFLICT**

In countries like Ethiopia, where livelihoods for most rural residents derive from land, land-related conflicts over ownership and boundary disputes can be particularly harmful and undermine productive activities. A number of studies indicate that land registration programs have the ability to reduce boundary disputes and litigation arising from such conflicts. In Ethiopia, there is evidence that land registration and certification has reduced the number of conflicts arising from border and inheritance disputes (Giri, 2010; Holden & Tefera, 2008). A basic premise of stronger and more secure land tenure is that the enforcement of these rights lessens the risk of being forcibly displaced and allows for a level of long-term security and a sense of permanence that encourages land-related investment (Besley, 1995). Tenure security also reduces the need expend resources to defend claims, which can be particularly important for women and minority groups, whose rights may not be sufficiently protected under traditional practices (Joireman, 2008).

## **LAND MANAGEMENT AND SOIL CONSERVATION**

Several studies show that land certification programs in Ethiopia have induced better land management practices (e.g. tree planting, construction of stone terraces) and ultimately improve land productivity (Deininger et al., 2011; Holden et al., 2009). However, whether land certification on its own is enough to induce soil conservation practices directly or whether this is a secondary consideration resulting from some other primary (i.e. economic) objective is not clear. The finding by Kahsay (2011) that land

certification's impact on soil conservation depends on household characteristics, such as off-farm economic opportunities and household labor, further highlights the difficulties of isolating this impact.

# 4.0 RESEARCH HYPOTHESES AND INDICATORS

In the context of the larger policy dialogue and in answering the question “how secure is secure enough?” a number of hypotheses have been proposed to test the relationship between second level certification and development outcomes. Note that the vast majority of smallholder plots in the highland regions covered under ELTAP and ELAP had already received first level certification at the time the baseline data was collected. As a result, any impact of second level certification will be in relation to what exists under first level certification – that is, the marginal benefit of second over first level certification.

The specific hypotheses to be tested include:

- H-1: Having a second level land certificate increases household access to credit (i.e. micro-finance).
- H-2: Second level land certification reduces the number of land-related disputes households face, and households with second-level land certificates require less time to resolve land-related disputes when they arise.
- H-3: Having a second level land certificate increases the likelihood households engage in land rental and sharecropping activities.
- H-4: Second level land certification increases household investment in productive assets – short and long-term.
- H-5: Second level land certification results in households having higher levels of agricultural productivity.
- H-6: Second level land certification encourages households to invest more in soil and water conservation (SWC).
- H-7: Having a second level land certificate results in stronger perceived tenure security for women and men.
- H-8: Second level land certification increases the extent to which households engage in off-farm income generating activities.
- H-9: Second level land certification increases women’s involvement in land management and decision making activities.

Addressing and empirically testing these hypotheses requires specifying indicators to measure and track changes in key outcomes to capture program impact. Following from the hypotheses above, outcome

indicators include: value of agricultural output per unit of land; cropping decisions (i.e. higher value perennials vs. lower value annual crops); use of fertilizer and other inputs; household and hired labor; soil conservation measures; frequency of land disputes of different types and the associated costs; and perceived risk of conflict and expropriation. To the extent possible, the analysis will differentiate the impact of certification by gender, as well as consider intra-household effects concerning asset control and participation in production-related activities. Depending on the hypothesis being tested and the specific indicator under consideration, location characteristics, such as distance to urban market or to *woreda* capital, may be of particular relevance and will be factored into the analysis as appropriate (i.e. as a control variable in regression analysis).

### **H-1: HAVING A SECOND LEVEL LAND CERTIFICATE INCREASES HOUSEHOLD ACCESS TO CREDIT (I.E. MICRO-FINANCE)**

Indicators:

- A.** Share of households having used land certificate to secure credit
- B.** Share of households perceiving land certification program will improve access to credit

Disaggregation:

- 1) By gender: Compare access to credit for those households whose head is male vs. households headed by a female.
- 2) By source of credit: Micro-finance, bank, individual

Notes:

- 1) In Ethiopia, land certificates (first or second level) cannot legally be used as collateral. Therefore, second level certification might increase credit if it is used to secure a loan through informal means.
- 2) The ELTAP baseline HH survey did not include content designed to capture the use of land as collateral.
- 3) Although the ELAP HH baseline did include content on the use of land and certificates to obtain credit, the information collected was limited. The endline survey for households includes greater depth and detail on the extent that land and land certificates are used to obtain credit. This information be used to create variables to directly compare with those credit-related questions from the ELAP baseline.
- 4) Assessing impact of ELTAP on access to credit will rely primarily on analysis of endline data using cross-section analysis methods.

### **H-2: SECOND LEVEL LAND CERTIFICATION REDUCES THE NUMBER OF LAND-RELATED DISPUTES HOUSEHOLDS FACE, AND HOUSEHOLDS WITH SECOND-LEVEL LAND CERTIFICATES REQUIRE LESS TIME TO RESOLVE LAND-RELATED DISPUTES WHEN THEY ARISE**

Indicators:

- A.** Share of households involved in a land-related dispute
- B.** Average number of land-related disputes per household
- C.** Average time taken to resolve land dispute

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By type of dispute: boundary/encroachment, inheritance, and divorce
- 3) By party: with family members, with non-family members

Notes:

- 1) Does not cover disputes relating to household grazing animals on someone else's crop or pasture land) as this was explicitly excluded from the baseline survey questionnaires).



- 2) The revised endline household and wives questionnaires allows for detail on disputes by parcel and are designed so that endline indicators can be directly compared with baseline data to assess impact (i.e. specifies disputes in the last 2 years).
- 3) The reference period is the number of disputes in the previous two years for both the baseline and endline surveys.

### **H-3: HAVING A SECOND LEVEL LAND CERTIFICATE INCREASES THE LIKELIHOOD HOUSEHOLDS ENGAGE IN LAND RENTAL AND SHARECROPPING ACTIVITIES**

#### Indicators:

- A.** Share of households engaging in land rental market activity
- B.** Household average area of land rented
- C.** Household average value per ha of rented land

#### Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By type of rental activity: renting IN versus renting OUT
- 3) By number of wives: compare activity with 1 wife with households with 2 or more wives

#### Notes:

- 1) Average value of economic activity generated from land rental activity per household is calculated by multiplying the average area of land rented by the average value per ha of land.
- 2) The ELTAP and ELAP baseline collected aggregate values on rental activity for the household. The endline uses parcel rosters to collect information on rental activity. The endline parcel-level rosters on rental activity also distinguish between monetary and in-kind payments. Thus, the endline data allow for creating variables matching those in the ELTAP and ELAP baseline on activities involving monetary payment. Since in-kind payments were not captured or valued as part of baseline, assessing total economic value of rental activity (i.e. includes monetary as well as in-kind payments) will be limited to cross-sectional analysis involving endline data.

### **H-4: SECOND LEVEL LAND CERTIFICATION INCREASES HOUSEHOLD INVESTMENT IN PRODUCTIVE ASSETS – SHORT AND LONG-TERM**

#### Indicators:

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

#### Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female.
- 2) By type of tree: fruit and non-fruit trees
- 3) By type of perennial crop: coffee, chat, enset, hops, sisal, bamboo
- 4)

#### Notes:

- 1) Control for number of trees received free of charge or planted in response to government requirement. Some of the farmers may have been required to plant trees as part of a government mandated conservation program (for example having land situated in a 'critical watershed area'). To account for this: i) the endline household questionnaire asks whether or not households were required to adopt water conservation measures; and ii) the community questionnaire asks if part of the community is located in a critical watershed and if members of the community have been required to adopt water conservation measures.

- 2) Number of trees per ha is based on total land holding.
- 3) Share is perennial crops divided by total cultivated area (includes rented land that is cultivated)
- 4) Where possible, assign values to inputs to allow computing of the total value of improved inputs per ha.

#### **H-5: SECOND LEVEL LAND CERTIFICATION RESULTS IN HOUSEHOLDS HAVING HIGHER LEVELS OF AGRICULTURAL PRODUCTIVITY**

Indicators:

- A.** Household average value of farm product per ha

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By type of income generating activity: crop production, livestock
- 3) By annual and perennial crop

Notes:

- 1) Control for communal pasture and shared grazing when estimating livestock productivity.
- 2) Developing a single measure – including for crop production or livestock broadly – requires assigning monetary values. The endline data collection obtains price information at the household and community level, while price information from the baseline will need to be extracted from household data or supplemented with historic price data that is locally relevant (i.e. sufficient spatial coverage) as appropriate. Where suitable and representative price data cannot be retrieved from the baseline data or obtained from another source, analysis will: i) focus on estimating impacts based on type of crop or livestock production as appropriate and given the available data; or ii) combine data (baseline, endline, and other sources) to impute locally-relevant baseline price data where gaps exist and use these to estimate baseline production values.
- 3) Total farm area including area rented in (less area rented out) is used to normalize.
- 4) Normalizing for crops is based on total cultivated area (includes land rented in).
- 5) Normalizing for livestock is based on non-cultivated land.
- 6) When valuing production, all farm products (those sold on the market as well as for home consumption) are assigned the same price to obtain the ‘true’ value (i.e. opportunity cost) of production.
- 7) Prices and income from baseline will be adjusted for inflation and values will be reported based on 2014 constant prices.

#### **H-6: SECOND LEVEL LAND CERTIFICATION ENCOURAGES HOUSEHOLDS TO INVEST MORE IN SOIL AND WATER CONSERVATION (SWC).**

Indicators:

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

Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By type of hedge, bund (soil, stone), and soil ditches

Notes:

- 1) Control for whether the farm has land plots on sloped lands where soil erosion is a problem.
- 2) Some of the farmers may have been required to adopt soil and water conservation measures by the government (for example having land situated in a ‘critical watershed area’). To account for this: i) the endline household questionnaire asks whether or not they were required to adopt water conservation measures; and ii) community questionnaire asks if part of the community is located in a critical watershed and if members of the community were required to adopt water conservation measures.

- 3) Considerations for whether household used its own (voluntary) resources and whether the structures are maintained by household or other party.
- 4) Control for use of irrigation in considering construction of water retention structures.
- 5) Length of hedge, bund, and ditch constructed combines the length attributable to the household without help as well as with help from others.
- 6) Number of on-farm water retention structures (ponds, retention ditches) constructed by the household itself (using its own resources) to date and existing.

### **H-7: HAVING A SECOND LEVEL LAND CERTIFICATE RESULTS IN STRONGER PERCEIVED TENURE SECURITY FOR WOMEN AND MEN**

#### Indicators:

- A.** Share of households that believe land redistribution of land in the kebele is not likely in the next 5 years
- B.** Share of households that believe renting land is not risky
- C.** Share of households that believe a certificate secures land holding
- D.** Share of households that would prefer to engage in business activity with someone holding a certificate on their land
- E.** Share of households that think they will benefit in the future from soil and water conservation measures
- F.** Share of households that think they will benefit in the future from the trees planted
- G.** Average household security perception index (see notes)

#### Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female
- 2) By rental horizon: one cropping season, five cropping seasons
- 3) By type of rental activity: renting IN versus renting OUT

#### Notes:

- 1) Analysis to control for population pressure (i.e. population density) as well as prior land redistribution activity (date of last redistribution) as appropriate and based on data availability.
- 2) Perception responses are based on a 4-category scale (strongly agree, agree, disagree, strongly disagree). For computing these indicators, response will be assigned 'YES' if response is agree or strongly agree, and 'NO' if responding with disagree or strongly disagree.
- 3) Average household security perception index is computed by assigning a value to each of the five questions that underly indicators (A-F). For each question a household will receive a value of 1 if the response was consistent with a strengthening of tenure security (i.e. responded with strongly agree or agree) and a value of 0 if response was consistent with weaker perceptions (i.e. disagree or strongly disagree). The household security perception index is computed as the simple average.

### **H-8: SECOND LEVEL LAND CERTIFICATION INCREASES THE EXTENT TO WHICH HOUSEHOLDS ENGAGE IN OFF-FARM INCOME GENERATING ACTIVITIES**

#### Indicators:

- A.** Household average number of weeks members have been away from home to find work
- B.** Household average value of income earned by members that have left home

#### Disaggregation:

- 1) By gender: Compare households whose head is male vs. households headed by a female.

#### Notes:

- 1) The rationale underlying this hypotheses and indicators is that stronger land tenure empowers holders to temporarily transfer rights for use of their lands, allowing the landholder to engage in other economic activities without fear of losing their land.
- 2) This question and hypothesis directed at a narrow subset of the population who would like to engage in

off-farm activities. When testing this hypothesis, the results will be conditioned on responses from the ELTAP and ELAP baseline, which indicated that households would prefer to 'rent-out their land and engage in another job' when asked 'What would you like to do with the farmland under your possession in the future?'

### **H-9: SECOND LEVEL LAND CERTIFICATION INCREASES WOMEN'S INVOLVEMENT IN LAND MANAGEMENT AND DECISION MAKING ACTIVITIES**

Indicators:

- A.** Share of wives with land in their name involved in household decision making regarding use of land
- B.** Share of wives who perceive/see land certification will enhance women's bargaining power within the household
- C.** Proportion of women who believe there are laws to adequately protect the land rights of women
- D.** Share of wives with land certification that think the certification will encourage them to rent-OUT their plot of land
- E.** Share of wives with land certification that think the land certification will positively impact their ability to negotiate whether or not they participate in the land rental market
- F.** Share of women renting out their land to a person that is not a close friend or relative

Disaggregation:

- 1) Type of household (polygamous, monogamous)
- 2) Household head: Female, Male

Notes:

- 1) The data used to compute these indicators is collected primarily through the wives survey. The revised version of the wives component of the household questionnaire includes a parcel roster and includes content to elicit the extent to which wives are engaged in decision making (i.e. what to grow, how production is used, whether or not to rent-out land, etc.).
- 2) For polygamous households, each wife's response is given equal weight and responses are not normalized based on the total number of wives in the household (i.e. a household with two wives would be treated as if they were two separate observations and given the same empirical weight as a wife from a monogamous household).

# 5.0 SAMPLING AND IDENTIFICATION

## SAMPLE DESIGN

Testing the research hypotheses involves measuring indicator levels prior to program implementation (baseline) and comparing these with levels after the programs have ended (endline). The development of the baseline survey instruments, sample design, and collection of the baseline data used in measuring pre-program indicator levels were covered under the ELTAP and ELAP program activities implemented by TetraTech. Under contract from TetraTech, The Ethiopian Economics Association (EEA) carried out data collection activities and supported the development of the survey instruments and sample design. Since the baseline sample design, questionnaire content, and data collection were carried out previously, there are practical limitations with respect to the strategy used to identify and measure program impacts. Fortunately, the baseline covered a large number of households (4500) and included treatment as well as control households.

**TABLE 2: TREATMENT AND CONTROL HOUSEHOLDS BY REGION**

		Region				Total
		Amhara	Tigray	Oromia	SNNP	
ELTAP	Control	326	199	285	275	1,085
	Intervention	573	700	618	627	2,518
	Sub-total	899	899	903	902	3,603
ELAP	Control	38	76	76	76	266
	Intervention	38	190	266	190	684
	Sub-total	76	266	342	266	950
Total		975	1,165	1,245	1,168	4,553

Source: (Ethiopian Economics Association, 2008, 2013, and ERC based on dataset tabulations)

The endline data collection will involve conducting a sample of approximately 4500 households and adopting a matched-panel approach where interviewers return to the same households to collect the survey data.

### ELTAP BASELINE

The ELTAP baseline by EEA was conducted in the 4th quarter of 2007 and included 3,600 households across the four focal regions. Although baseline data data was collected in the third year of the program, there was no surveying and registration activities in 2005 or 2006 (

Table 1. Although parts of the sample might have been contaminated (i.e. households having received some portion of the land intervention treatment prior to the baseline data collection), this is not likely

to be a major issue, especially since certificates were not issued until 2008. However, to the extent that some households may have received some portion of the treatment prior to data collection, these households will be flagged, and the extent to which these data may be compromised for the purposes of evaluating program impacts will be assessed. A review of the program and survey documentation revealed that the selection of households was not fully random, since a systematic approach, rather than random selection, was used in selecting some of the sample *kebeles*. For example, the size of *kebeles* and logistic requirements in terms of travel and access to the *kebeles* were taken into consideration and spatially selected in the following manner: i) 3 program and 1 non-program *kebeles* were selected from those far away from *woreda* capitals and/or main roads; ii) 3 program and 1 non-program *kebeles* were selected from among those that were in a medium range distance from *woreda* capitals and/or from main roads; and iii) 2 program and 1 non-program *kebeles* that were close to (5 km) *woreda* capitals and/or main roads (Ethiopian Economics Association, 2008). Although we are beholden to the sample design and approach taken when collecting the baseline, knowing the selection process is useful as some of the selection bias resulting from this systematic selection can be controlled for when specifying the empirical model for analyzing the data.

### ELAP BASELINE

The ELAP baseline household survey was conducted by EEA during the months of April and May 2012. The household survey instrument was largely the same as that used for the ELTAP baseline with additional coverage of key variables. In particular, the ELAP household survey instrument included additional questions capturing the use of a land certificate to obtain credit (through informal as well as formal means) and greater scope covering perceptions on the types of rights. Since the ELAP baseline survey was conducted in spring 2012, the household survey was not a 'true' baseline, since a large number of households would have been treated starting in 2009/10 (Table 1). Unlike ELTAP, where the introduction of program activities prior to the collection of the baseline is likely to be minimal and manageable, compromised baseline data is likely to be much more of an issue for ELAP households. In conducting the analysis, it will be important to identify which *kebeles* were surveyed at what times and when certificates were ultimately issued to assess whether or not those data can be used for the purposes of assessing program impacts. Like ELTAP, the selection of households and the areas being sampled during the ELAP baseline was not fully random. Under ELAP, 18 ELAP program *kebeles* were non-randomly selected from the sample *woredas* based on the recommendation of ELAP program management, as they had been identified as having high potential for agricultural investments. An additional 7 non-program *kebeles* were selected randomly to serve as control *kebeles* (Ethiopian Economics Association, 2013).

### ANALYSIS AND IDENTIFICATION STRATEGY

Following the collection of the endline data and after merging this with the baseline data, the combined data will be analyzed using two methods: comparison of average outcomes and difference in differences. To the extent data are randomized, we can measure the impact of the interventions by comparing the average outcomes of individuals in the treatment group to those in the control group using data collected from baseline and endline surveys. We can further disaggregate to see if the intervention impacts differ by gender, economic status, or other categories as appropriate.

A second strategy involves difference-in-differences methods to test the robustness of the uncontrolled analyses (Ravallion, 2001). Difference-in-differences (DiD) estimates the impact by comparing the change

in outcome for the treatment group with the change in outcome for the comparison group. This method allows us to take into account any differences between the treatment and comparison groups that are constant over time. The two differences are thus before and after, and between the treatment and comparison groups. The difference-in-differences estimator controls for time-invariant social and environmental characteristics that might be correlated with both treatment status and outcomes. By comparing the difference in the control group from the treatment group, both constant factors, any time-varying factors common to both the control and treatment group will be removed from the measured impacts, resulting in a ‘cleaner’ estimate of impact with fewer confounding factors. The basic difference-in-differences model can be specified as a two-way fixed effect linear model:

$$y_{ijt} = aT_{jt} + \sum_k b_k X_{ijtk} + c_j + d_t + \varepsilon_{ijt}$$

Where  $y_{ijt}$  is the outcome indicator variable for an individual  $l$ , located in cluster  $j$ , and in period  $t$ .  $T_{jt}$  is an indicator of whether the cluster  $j$  is part of the intervention group in period  $t$ , and  $a$  is the average impact of the intervention. (Where there are multiple intervention arms, the model would be adjusted, allowing for additional indicator variables.) The  $X$  is time varying control variables (such as family size, total income, number of children, etc.) with the  $b_k$  identifying their effects on the outcome,  $c_j$  is the cluster fixed effect,  $d_t$  is a time fixed effect, and  $\varepsilon_{ijt}$  is an error term.

The form of the outcome variable will determine the error structure of the linear model. For example, if the outcome  $y_{ijt}$  is income from agricultural activities, then we will specify an ordinary least squares model with a random error term that is normally distributed. If the outcome variable is the number of plots of rented land, then one would assume a negative binomial error distribution and use the total number of plots under production as an additional offset in the model. If the outcome variable is a binary variable (i.e. yes or no in response to whether or not a certificate has been used to secure access to micro-credit), then we would specify an appropriate model, such as the logit or probit. As well, for questions that have multiple responses, the model for handling ordered/ranked responses, as well as non-ordered responses, can be specified, for example as an ordered logit or multinomial logit, respectively.

## LIMITATIONS AND IMPLICATIONS FOR ANALYSIS

Given the way the *kebeles* were selected for inclusion, selection bias will be a concern that will require a more thorough treatment. The DiD method assumes that time trends are similar in the comparison and treatment groups before and after the intervention takes place and starts to break down when areas are purposefully selected, such as being designated as ‘high potential’. In these instances, a more sophisticated econometric approach will be needed, and the appropriate approach can depend to a degree on the outcome indicator in questions and the extent to which bias will be an issue. Depending on the data and the specific indicator in question, candidates for analysis include propensity score matching, instrumental variables, as well as models that combine parametric and non-parametric methods to control for sample bias (Heckman, Ichimura, Smith, & Todd, 1998). Regardless of the econometric methods employed, collecting additional community information will be key in helping to assess the extent of the bias and the viable options for controlling for this.

The problem of having collected the baseline after the second level activities had begun in some areas will need to be addressed on a case-by-case basis. For ELTAP households, this is not likely to be an issue since, even though the data were collected in the 4th quarter of 2007, there was no surveying and registration activity in 2005 or 2006, and actual certificates were not issued until 2008. For ELAP, it will be more complicated and will require looking at the data in more detail. Depending on the extent to which the baseline data are 'contaminated', one option would be to disregard those observations/data points altogether. If this would result in omitting too many variables, a regression model incorporating continuous treatment specification may be appropriate. The community survey instrument developed for the endline (which was not part of the baseline) requests information on the timing of events related to the certification program (i.e. when activities started, first community engagement, etc.) and will be useful in determining what methodology is most appropriate moving forward.



# 6.0 SURVEY AND MANAGEMENT

## SURVEY INSTRUMENTS

The endline data collection includes a general household survey including a separate wives component, a community-level key informant survey, and a short questionnaire administered to *woreda* land administration offices.

## HOUSEHOLD SURVEY

Under ELTAP and ELAP, information was collected from households using two survey instruments: a general household survey and a wives survey. The household component involved collecting information on land holdings, production activities, land use, perceptions on land tenure security, etc., as applied to the household as a whole. The wives survey was administered to male-headed households with one or more wives. The wives survey instrument collects additional information to better understand differences and similarities between women and men and their perceptions of tenure security and land-use decisions.

The information collected during the baseline will have a major bearing on indicators used to measure changes overtime and to assess impact. As a result, the information collected from households as part of the endline draws heavily from what was collected under the ELTAP and ELAP baseline data collection. Although the two programs were implemented five years apart, the ELTAP and ELAP baseline surveys were generally the same in terms of both structure and the specific questions asked. There were some minor differences in content, with the ELAP baseline household instrument including additional content, such as on obtaining credit, which was not part of the ELTAP baseline. The endline household instruments include these additional changes in addition to a number of significant revisions. The endline household instruments incorporate the following changes and additions:

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

Note that in revising the endline household instruments to provide additional detail, care was taken to ensure this information can be used to impute an endline value that can be compared with the baseline

responses. For example, in assessing the impact on rental market activity, one of the indicators is the amount of land the household rents out. In the baseline, a single question captures total amount of land rented out, while in the endline households indicate on a parcel-by-parcel basis which plots they have rented out. In this case, to create a variable comparable to the baseline value, one simply sums over all parcels rented out by the household. Although the additional parcel detail will not be directly comparable with baseline, this approach results in more precise estimates and allows for the possibility of cross-sectional analysis methods in addition to the type of analysis and identification strategy discussed in the previous section. The additional parcel-level detail also allows for future implementation of a performance evaluation component by noting parcel-by-parcel changes in land tenure status that should be recorded in the registry (revise ownership, transfer, death/inheritance, etc.) and whether households have taken steps to register these changes, which would allow for cross-referencing with the records at the *woreda* land administration office to see if those changes have been recorded.

The time taken to complete a household interview as part of the ELTAP and ELAP baselines is reported to have taken 4-6 hours. In an effort to reduce the time required to complete an interview, non-essential and low-priority content from the baseline is excluded from the endline. The endline survey when administered to households is expected to take between 2-4 hours.

In addition to the household survey instrument, the endline data collection for ELTAP and ELAP will include two new instruments, including a community key informant interview and a *woreda* land administration questionnaire.

## COMMUNITY KEY INFORMANT

The community key informant interview will be administered to key informants in approximately 250 villages. The instrument is used to collect community-level information on the following:

- Price information
- Access to basic services
- Sources of employment and typical wages
- Agricultural activities
- Land administration
- Time of first and/or second level certification

The time estimated to complete a single key informant interview is approximately 1-2 hours.

## WOREDA LAND ADMINISTRATION OFFICE SURVEY

The *woreda* land administration questionnaire will be administered in approximately 30 to 35 *woreda*, and is designed to collect a limited amount of information on fees and services offered by *woreda* land administration offices. More specifically, the *woreda* land administration questionnaire collects the following types information:

- The cost associated with obtaining a new land certificate

- The out of pocket costs associated with permanent (divorce, inheritance, etc.) and temporary (sharecropping, renting-out, etc.) changes in land ownership
- The number of trips to the woreda land administration office required to complete a land administration activity
- How first and second level joint certification are confirmed between a husband and wife in the woreda

## **PROTECTION OF HUMAN SUBJECTS AND INSTITUTIONAL REVIEW BOARD**

All data collection activities will adhere to professional and ethical standards for the treatment of human subjects. The evaluation team will submit the proposed impact evaluation to the Institutional Review Boards (IRB) at Clark University. The IRB is an ethics body in charge of overseeing and monitoring research activities involving human subjects. The IRB's main role is to ensure that research procedures do not pose more than negligible risk to the participant subjects and to assess the adequacy of safeguards to protect subjects' rights, welfare, and dignity. Researchers are required by the IRB to: (1) inform the subjects about the purpose, risks, and benefits of the study so that they can make an informed decision about whether or not to participate in the research and (2) protect the anonymity of subjects and the confidentiality of the data.

Even though this activity involves surveying individuals covered under the baseline survey and involves questions exactly or very similar to those used earlier, a review will be conducted to ensure the activities "... conform to legal and other requirements governing research with human subjects in the country where it is conducted" (pg 3 [d] USAID, 2006). The evaluation will conform to the legal and other requirements governing research with human subjects in Ethiopia. Although there is no formal IRB requirement in Ethiopia, or official regulations regarding conducting household surveys, it is common practice to receive a letter of approval for conducting the survey from the relative ministry (Ministry of Agriculture) and from the local and Regional governments.

Furthermore, the research team will provide training to all enumerators and qualitative researchers to ensure they understand these principles. Upon completion of research activities in the field, the data will be maintained in a way that adheres to general IRB principles. All analyses and publications will respect the anonymity of respondents; no identifying information will be used in reports or presentations. The mode of analysis will follow econometric standards for survey research, the aim of which is to make general claims about the participant and non-participant populations, not specific claims about identifiable individuals.

## **SURVEY FIRM**

ERC will be issuing a competitive request for proposals (RFP) for the endline data collection. The RFP will be issued in July with plans to have the proposals returned early August. A technical review panel will independently score the proposals received according to the technical guidelines developed prior to the issuance and included with the RFP. Following the independent review, the panel will meet to discuss and request additional information as needed before providing a review and ranking of the prospective firms. A financial review panel will also independently review required information. Meetings of the

technical and financial review panels will be held prior to final selection. The selected firm will be notified of the winning bid at the end of August. Firms submitting, yet not selected, will also be notified.

## **TABLET-BASED DATA COLLECTION**

The endline data collection will be carried out using a tablet-based approach. While there is additional up-front effort required to program the questionnaire, train staff and enumerators on the use of tablets, and manage the tablets and hardware to limit complications in the field, there are a number of clear benefits. In general, a tablet-based approach reduces data entry errors and improves the quality of the data (Caeyers, Chalmers, & De Weerd, 2010). Most software includes functionality that allows for validating results, pre-populating entries based on prior information (i.e. household roster from a baseline survey), and routing capabilities that modify the information collected based on prior responses. While most survey software packages have these capabilities to some extent, the level of computer literacy and programming skill can vary considerably. The capability for consolidating and merging data from the household interviews and suitability for organizing data from lengthy questionnaires also vary considerably. Key considerations in selecting a software-hardware solution for this endline data collection were the ability to handle and organize a large amount of data given the relatively long survey instrument (estimate 4-6 hours to complete a household survey) and the ease with which the questionnaire could be programmed into the software.

## **TABLET USE AGREEMENT AND LOGISTICS**

Tablets used for conducting the survey will be provided by Cloudburst to the Survey Firm if necessary. Ideally, the Survey Firm would have their own tablets for conducting the survey and have developed in-house capacity. To address this while at the same time helping to build capacity with the firm in-country, it was decided that Cloudburst would purchase and procure any necessary electronic devices plus any additional accessories through ERC. The procurement will be a one-time cost that, while being incurred mainly under this Task, can be leveraged against future data collection activities. Future data collection applies to those in Ethiopia as well as under other ERC tasks requiring data collection.

Frequent communication and coordination between the Survey Firm and the ERC IE team will be required to make sure the technology is available and ensure sufficient training and troubleshooting has taken place to ensure final data collection is carried out in a timely and efficient manner. The number of enumerators and field teams must be known as early as possible to ensure the tablets can be provided to the Survey Firm in a timely and efficient manner. Prior to any training or field activities sufficient piloting of the hardware should be carried out to ensure the hardware and software meets the necessary requirements. Changes to the questionnaires and programming into the survey software must take into consideration the time and effort necessary to test the updated version and ensure all tablets have been uploaded with the most current version of the questionnaire. Modifications or additions to the hardware and accessories will take considerably more time due to the logistics associated with sourcing, procuring, and locating a large number of devices/accessories. As such, pre-piloting and testing of the technology package should take place well in advance. ERC IE team with input from the Survey Firm will develop a plan for addressing the logistical challenges.

A Tablet Use Agreement allowing the Survey Firm to take possession of the tablets and accessories will need to consider:

- Terms for taking possession of the tablets and accessories from Cloudburst;

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

### **INSTRUMENT PROGRAMMING**

The ERC team will program the questionnaire into the survey software to allow for collection using mobile/tablet devices. To the extent possible, the tablet-based approach will incorporate the built-in functionality of the software to reduce errors in data entry (i.e. validation checks), pre-populate fields of the questionnaire based on prior round of household data collection (i.e. household roster information such as names from the ELTAP or ELAP baseline survey), and build in routing capabilities to improve efficiency of the data collection and reduce the potential for errors (i.e. collecting information on crop inputs and production only on plots of land which are under cultivation). Following the initial adaptation of the questionnaire to the survey software, the Survey Firm will ensure the questionnaire is translated into the local language (the survey software allows for switching between English and local languages). Ensuring the devices and programming meets the necessary field and language requirements will be the responsibility of the selected Survey Firm. Testing and revising of the software will be carried out on an ongoing basis and it will be important that the Survey Firm has an individual dedicated to programming the questionnaire into the software and building sufficient capacity in the use of tablets to allow for trouble shooting of potential problems as they arise in training exercises as well as when being implemented in the field.

### **DATA MANAGEMENT**

Using electronic devices for data entry during the course of a household survey to populate a central dataset, the need for data entry personnel to transcribe paper entries is virtually eliminated. However, to make sure the data is organized and documented appropriately requires careful management and monitoring. This entails appropriate attention to setting up the database structure and shell for recording data, monitoring the data as it comes in from the field and identifying problems/issues as they arise, and creation of the final dataset complete with documentation. Since this is an endline survey, a catalog of variables and correspondences with baseline data will also be required. The baseline here consists of two datasets – ELTAP and ELAP – that will need to be reconciled (i.e. adopt a common set of variable names and identifiers and flagging questions that are in one dataset but not the other) to allow merging with the endline dataset. A final data dictionary will clearly document and describe the final dataset and information on each of the data files.

The data management plan developed with the Survey firm and will include:

- Coding strategy in order to maintain consistent, unique identifiers for households for matching longitudinal data (i.e. common variable names for matching across ELTAP/ELAP baseline data with the endline dataset and documenting clearly);
- Specify which variables from the baseline surveys (ELTAP and ELAP) will be used to pre-populate fields in the survey questionnaire;
- Working with survey programmer(s) to adapt data entry range and consistency checks to values appropriate for the country context, based on existing HH survey data (i.e. if age of household head was 35 at time of baseline for ELTAP in 2007, then validation error if age in 2014 is less than 41 or greater than 43);
- To the greatest extent possible, the data entry program should conduct range and consistency checks, in real-time as the data from each questionnaire is entered;
- The program should allow valid open-ended and “other” textual responses outside of the response options provided in the questionnaire; and
- Variable names generated by the program should correspond clearly and logically to the question labels used in the questionnaire.

# 7.0 DELIVERABLES

## **IMPACT EVALUATION REPORT**

The endline report and associated analysis will be completed approximately six weeks following receipt of the final dataset. The impact evaluation report will report both the effects of the treatments versus controls, and the effects of each of the types of treatments vis-à-vis one another on the outcomes of interest. In addition to investigating average treatment effects, the report will also include a discussion of heterogeneous treatment effects to the extent possible. The report will also include the results of cross-sectional analysis of data collected at the endline that were not included in the baseline data collection. The analysis in the impact evaluation report will follow the plan outlined in the baseline report.

## **POLICY BRIEF**

We will prepare a policy brief of approximately 10 pages that highlights the most policy-relevant findings from the evaluation. This brief will be completed following the endline analysis.

## **FULLY DOCUMENTED DATA SETS**

We will deposit fully documented data sets with USAID LTD following the final round of data collection. The format, reporting detail, and organization of the data and any documentation will conform to the general reporting standards to be adopted for all data collected under the ERC Task Order. Along with reporting standards, safeguards will be implemented to ensure personally identifiable or otherwise sensitive information is removed prior to being made public. The fully documented datasets will be made public following approval from USAID LTD.

# 8.0 TIMELINE OF ACTIVITIES

Activity	2013					2014												2015					
	S	O	N	D	J	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	
<b>IE Design</b>																							
Preliminary stock taking of documents and data	■	■																					
Scoping trip																							
Refine research questions, specify indicators			■	■	■																		
IE design for review																							
SOW for data collection developed		■	■	■	■																		
Prepare budget																							
LTD review of IE design																							
LTD Approval of IE Design																							
<b>Survey Preparation</b>																							
Contract signed with survey firm																							
Adaptation of survey questionnaire to tablet software																							
Trip - work planning, device testing, training																							
Questionnaire development and translation																							
Secure devices and other equipment																							
Field work and data management planning																							
<b>Survey Implementation</b>																							
Field staff recruitment and selection																							
Training of field staff																							
Field work and data entry																							
Dataset creation, documentation, and delivery																							
Final field report from survey firm																							
<b>Analysis and reporting</b>																							
Draft report and preliminary analysis																							
Final report																							



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