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Unbundling Land Administrative Reform: Demand for Second Stage Land Certification in Ethiopia

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Unbundling Land Administrative Reform:

Demand for Second Stage Land Certification in Ethiopia

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Abstract

Ethiopia has implemented one of the largest, fastest and cheapest land registration and certification reforms in Africa. While there have been evidences of positive impacts of this land reform in terms of increased investment, land productivity and land rental market activities, the government is now piloting another round of land registration and certification that involves GPS measurement and computer registration. This 'Second Stage land registration' is expected to replace the registration from the first round that used field markings in combination with memory of the neighbors to identify plot borders. We use panel data from 600 households in two regions (Oromia and SNNP) to investigate household perceptions and demand for such a Second Stage reform. Our study has revealed a relatively low demand and WTP for Second Stage certificates. The WTP also decreases significantly from 2007 to 2012 while the value of land increases dramatically in the same period. Households with larger land holdings and male-headed households whose First Stage certificate contained only the husband's name are especially less interested in a new registration. Households who attended a meeting on land registration are more interested and willing to pay for Second Stage certificate. The demand for Second Stage certificates comes primarily from the Land Administrations as it can provide a better basis for Land Administration and produce public documentation of land-related affairs.

JEL Codes: Q15,

Key words: Land registration and certification, Second Stage registration and certification, joint land certification, land administration, gender.

1. Introduction

Ethiopia has implemented one of the largest, fastest and cheapest land registration and certification reforms in Africa (Deininger et al. 2008). There is growing evidence of positive impacts from this land tenure reform in terms of increased investment, land productivity and land rental market activity (Holden et al. 2009; 2011; Deininger et al. 2011; Bezabih et al. 2012). Positive welfare effects in the form of increased food availability and improved child nutrition have also been identified (Holden and Ghebru 2013; Ghebru and Holden 2013). While there is some variation in the way land registration and certification has been implemented across regions, and even within regions in Ethiopia, the broad-scale First Stage land registration and certification involved registration and demarcation of land plots without use of GPS and computer registries. The advantage of that was that less training was needed, electricity was not a necessity and technology costs were minimal while the process was highly participatory. The main registry for plot borders were the field markings in combination with memory of the neighbors who whose lands border every farm plot owned by the households. While the initial cost was extremely low (about 1US$ per farm plot or less), the system had limitations in terms of facilitation of maintenance and updating. Ethiopia has been piloting and introducing Second Stage land registration and certification in selected districts in the four big highland regions . We use data from 600 households in two regions (Oromia and SNNP) to investigate household perceptions and demand for such a Second Stage reform.

We know that there was a high demand for the First Stage registration and certification as it helped to reduce tenure insecurity. But, can we be so sure that farm households see similar important additional benefits from getting plot-level certificates with maps rather than the farm level certificates that they already have? How quickly will the First Stage registration and certification need a serious updating and upgrading not to lose its effect? Perceived benefits from the new certificate are likely to determine the Willingness-to-Pay (WTP) for such certificates and this may matter for how large-scale Second Stage land registration and certification can be implemented and financed. We assessed the WTP in monetary terms and in Willingness-to-Work (mandays) that households were willing to contribute in order to get such Second Stage land certificates with maps. How does the WTP vary with farming system, household characteristics, market access and the quality of the First Stage registration and certification? Our data cover a substantial variation in agro-ecological conditions, including cereal-based crop-livestock systems where oxen serve as the main source of traction power, perennial zones with irrigation and cash crops, perennial zone without irrigation, with more limited market access and subsistence orientation, and areas with urban expansion. Our household panel data from 2007 and 2012 allow us to assess how the demand for Second Stage certificates has changed over time in our study areas. The first survey took place one to two years after the First Stage registration and certification. The findings should be highly relevant for the design of future land administrative reform in Ethiopia and elsewhere, e.g. for identification of what types of areas to target first and for whether the recipients are willing to pay a large share of the costs of the Second Stage reform.

We found low interest in the Second Stage certificate, especially compared to First Stage certificate. Both the general interests in Second Stage certificate as well as the amount interested households are willing to pay for such certificate declined from 2007 to 2012. Our econometric analyses show that households that participated in public meetings in relation to the First Stage registration and certification and households that have experienced land disputes before the First Stage registration had higher WTP for Second Stage certification while households that have larger land holding have lower WTP.

2. Literature review

2.1. Land registration and land titling

Land titles are associated with full private property rights that can be transferred in land sales markets and where land can be used as collateral to obtain loans. The title is a written document providing proof of ownership and this ownership is also recorded in a publicly recognized central land registry. Modern land titles are also associated with high quality and accurate maps and coordinates that can be used to verify the exact spatial borders of such property. Titled land has typically been surveyed and mapped by professional surveyors using high quality precision tools to record the borders of the property. Upgrading of land titling systems has been a gradual process in most countries due to the costly and time consuming nature of the work. In many countries this has been a demand based process where those demanding the title have had to pay for the costs which also have been high because such service has been offered to individuals upon demand. Such procedures have often been associated with slow bureaucratic processes and many steps that have opened opportunities for corruption, rent-seeking and "elite capture". They have also created an unleveled playing field where the poor and less well connected typically have been marginalized. Many have therefore become skeptical to formalization of land rights through land titling in developing countries such as in Africa. Land titling has been seen as a threat to customary land rights (Benjaminsen et al. 2009; Cotula et al.2004).

Feder and Nishio (1999) reviewed successful land registration and titling programs in Asia and Latin-America where positive investment, credit access, land productivity and land value effects were detected. Such effects were found in Thailand, The Philippines (urban area), Indonesia (urban area), Honduras, Paraguay, and Peru. A study in rural India (Pender and Kerr 1994) found no significant positive effects on investment or credit access. Studies in Africa; in Ghana, Kenya and Rwanda (Migot-Adholla *et al.* 1991) found that land registration had no significant impact on land productivity, land investment or credit access. Jacoby and Minten (2007) also found no significant effects of land titling in Madagascar. Besley (1995), however, found a positive effect of new land rights on investment in trees in one area in Ghana.

Feder and Nishio (1999) emphasize that many prerequisites have to be in place before positive impacts of land registration can be achieved, including weaknesses in existing formal or informal tenure systems that therefore do not provide the necessary tenure security that is essential for investment. Positive impacts on credit markets and land markets will not occur unless there is a

demand for such markets. Land cannot be used as collateral by lending institutions unless there exists a well-functioning land sales market. Land laws and land administrations that can implement the laws and the land registration and titling in a transparent and reliable way and with clear conflict resolution systems are essential. There is a risk that the introduction of a modern registry system to replace a traditional tenure system can result in land grabbing ("elite capture") by the better informed, more influential and more wealthy stakeholders. There are fears that the effect could increase landlessness and cause negative effects of formalization of land rights on the poor. Corruption may also undermine the functioning of land administrations because staff may take advantage of their positions. Local participation in the process and simple, efficient and transparent procedures are also important for popular demand and success.

Both customary and statutory tenure systems have tended to have a gender bias in favor of men over women. Land titles have typically been allocated to the head of the household who in most cases is a man. There have been many cases where formalization of land rights through land titling has undermined customary land rights which have been ignored or not respected. The high cost of land titling has made many countries to establish a system of land titling upon demand and this has made land titles even more costly and only available to the wealthy (Benjaminsen et al. 2009; Besley and Burgess 2000; Cotula, Toulmin, and Hesse 2004; Deininger 2003). There is therefore a high need for more low-cost, broad-scale and egalitarian systems for land registration in low income countries.

2.2. Costs of formalizing land rights

In Honduras the cost of land titling was estimated at US$ 600 per title (Lopez 1996) while in Madagascar it has been estimated at 150 US$ per household with the conventional titling upon demand (Jacoby and Minten 2007). Burns (2007) has assessed the variation in costs across many countries and found average costs to be between 20 and 60 US$ per parcel. Ayalew et al. (2011) provide an estimate of the costs of hiring private surveyor for titling upon demand for urban land owners in Dar es Salaam, Tanzania, of about 350 US$. At the other extreme we find the Ethiopian First Stage land registration and certification where the cost of registration and certification was estimated to be about 1USD per farm plot or 3.5USD per household (Deininger et al. 2008). Following are the main attributes of the Ethiopian low-cost First Stage land registration and certification:

- Broad-scale, whole communities were registered in one sweeping exercise within a short period of time. About 6 million households and 20 million plots were registered and certified within a few years (Deininger et al. 2008).
- Participatory, high degree of involvement of local people in plot boundary identification and demarcation, with neighbors as witnesses
- Implementation by staff with only short-term training, no skilled surveyors involved
- Simple technology, use of ropes for plot measurement, use of simple forms for recording information, no maps, no GPS, no computers

- Registry books recording information on household , kept at community and district level
- Transparency is achieved by the broad participation
- Conflict resolution system builds on existing system with local conflict mediators, social courts, but also involvement of new local Land Administrative Committees (there is variation across regions and over time).
- Provision of certificates to individual households with information about plots belonging to these households, with data on name and photo of household head (and other household members in some regions), location, plot size, land quality, and names of neighbors for each plot.
- Weaknesses: Maintenance, the registry books are not easy to update e.g. when ownership of land for specific households is changed. Plots do not have unique numbers, only households have unique numbers. Information access for purpose of policy analysis is difficult as data are not easily available and no maps exist.

The development is towards intermediate solutions to the classical land titling approach and the Ethiopian First Stage land registration and certification approach. Technological advances facilitate more low-cost approaches that utilize GPSs, satellite images, computers, and new software to generate maps and registry systems at a much lower cost than the classical land titling approach. The cheapest of these methods imply some sacrifices in the accuracy of identification of plot borders as the accuracy of low-cost GPSs that are commonly used may only be at the 5-10 meter level. Still, this may be good enough for mapping purposes. However, such maps cannot be used as a basis for solving plot border disputes related to small-scale encroachment by neighbors. For such cases the Ethiopian system with participatory border identification and demarcation with neighbors as witnesses is more reliable and cost-effective.

Based on a comparison of these two extremes it is also possible to identify some intermediate solutions that can be implemented through a one stage formalization or through an upgrading of a low-cost formalization approach such as that used in Ethiopia. Technological advances has made this feasible at a substantial lower cost than the traditional titling approach while at the same time benefitting from centralized and computerized mapping and registry systems that are easier to maintain and update. Such systems have recently been introduced in a number of countries such as at a broad scale in Rwanda and at pilot level in Ethiopia and Tanzania.

2.3. Empirical evidence on impacts of low-cost approaches

A number of studies have investigated the impacts of low-cost approaches, especially in Ethiopia. Deininger et al. (2008) provided an overview of the Ethiopian low-cost approach with cost estimates and indicated that the land of more than six million households had been registered within a few years. In a national survey of 2315 households they asked about the Willingness to pay (WTP) for lost certificate to get an idea about households' valuation of the certificates. The WTP was highest in Oromia region (mean 22 EB), followed by Amahara (mean 9 EB), SNNP (mean 7 EB) and Tigray (mean 5 EB). These figures may be compared with the

actual payment of 5 EB + 4 EB for one photo for the certificate in Oromia region and 2 EB + 8 EB for two photos (optional) in SNNP region (Holden and Tefera 2008). About 90% stated that they would like to have a map to their certificate and that they were willing to pay for such a map in the study by Deininger et al. (2008). However, no questions were asked about how much they were willing to pay for the map. The study also provides cost estimates for high precision land registration with electronic total stations at 49 EB per plot and 175 EB per household and for low-precision registration with handheld GPS at 13 EB per plot and 45 EB per household. Holden and Tefera (2008) found that 60% of the households in their study in Oromia and SNNP regions wanted a certificate with map of the plots. The demand was lowest in Wondo Genet (22% demanding certificate with maps) where the ELTAP/ELAB project had been implemented with the more comprehensive approach.

Holden et al. (2009) provide evidence of the investment effects of land registration and certification in the Tigray region. The study found evidence of significant positive investment impacts on tree planting, maintenance of soil conservation structure and land productivity. Land productivity was found to be about 40% higher on plots with certificate than on plots without certificate. The study focused on owner-operated plots only and therefore captures the tenure security-investment impact, not the impacts through land transfers.

Holden et al. (2011b) investigated the impact on land disputes, and particularly that on land border disputes in Tigray using a sample of 405 local conflict mediators from 85 villages who have mediated more than 18 000 disputes out of which 9700 land related disputes. Out of these land-related disputes 3630 were land border disputes. The local conflict mediators perceived land border disputes to be among the most difficult disputes to mediate. 58% of the conflict mediators perceived that the amount of such disputes was reduced during the process of registration and certification while 14% perceived that such conflicts increased during the process. 68% of them perceived that such conflicts had reduced after the registration and certification while 12% perceived that there was an increase after. About 5% perceived there to have been an increase both during and after registration and certification while 50% perceived there to have been a reduction in disputes both during and after. Econometric analysis revealed that the increase in border disputes was associated with low quality land registration work in terms of plot border demarcation and measurement and failure to demarcate community borders. However, such quality work appeared to have happened only in a fairly small share of the communities. In a similar study of 180 conflict mediators in the Oromia and SNNP regions Holden and Tefera (2008, p.70) found that there was a significant reduction in disputes after registration and certification in areas where such disputes were common before registration. Also in their study they found that poor quality of land registration tended to enhance disputes in a few communities as an exception to the overall positive impacts.

Holden et al. (2011a) found that land certification has enhanced tenure security and the willingness to rent out land and amounts of land rented out among potential landlord households in Tigray region, and especially for female-headed landlord households. Holden and Ghebru

(2011) investigated this issue further and found that productivity on rented out land has improved more on plots rented out by female landlords than that of male landlords. They also found a significantly stronger welfare improvement effect, measured as real per adult equivalent consumption expenditure, with duration of ownership of land certificates, and particularly so for female owners of certificates.

Deininger et al. (2011) found similar early impacts on tenure security, land renting and investment in the Amhara region of Ethiopia but did not investigate the gender dimensions carefully. Bezabih et al. (2012) used the same data from the Amhara region and found a stronger productivity impact from certification on rented land and most so for female owners.

Holden and Tefera (2008) assessed the early impacts of joint First Stage land certification in Southern Ethiopia (5 districts in Oromia and SNNP regions). For male heads of households one may see two effects, a) a positive effect of registration and certification in form of enhanced tenure security for the household, and b) a negative effect for the male head in form of reduced intra-household control over the land if the joint certification enhances the women's position and land rights within the household. Their study revealed that the large majority of male heads of households perceived there to be a net positive effect from the process and they therefore welcomed the joint land certification.

The above studies reveal important benefits from First Stage land certification through enhanced tenure security because of reduced risk of land redistribution, improved plot border demarcation with witnesses and thus reduced risk of encroachment by neighbors, and improved transferability of land through the rental market.

2.4. Current policy context

The official website of the Ethiopian Ministry of Agriculture (2013) characterizes the First Stage certification as "*a process of providing "simple" temporary landholding certificates… Under Stage 1, farmers receive temporary certificates with no geo-referencing or mapping of land parcels.*" (Ministry of Agriculture 2013). The website further states that 6.3 million out of 13 million households have received such certificates in the four major Regional States (Tigray, Amhara, Oromia, and SNNP). It is also stated that the target is to provide Stage 1 certificates to the remaining 6.7 million households and "*to scale up for a successful 1 million households land administration pilot issuing permanent certificates, with geo-referencing and mapping of individual land parcels. This land administrative work is referred to as the Second Stage or Stage 2 of the certification program.*" The objective of the Second Stage certification is also stated to enhance tenure security for smallholder farmers because this will "*stimulate greater investment by farmers in sustainable land management practices.*" Furthermore, it is stated that the "*Stage 2 component seeks to rectify the weaknesses in the Stage 1 land certification, particularly the need to geo-reference and map individual parcels to avoid or minimize boundary disputes*." The intention is to scale up the pilot approach used in project funded by SIDA and USAID.

The statement above indicates that the MoA believes that the maps can help resolve border disputes. Borders of plots identified with handheld GPSs may not have an accuracy level of more than 5-10 meters and that is insufficient to resolve border disputes where the degree of encroachment is smaller than that. More severe encroachment is likely in the case of communal lands but much smaller levels of encroachment are likely to lead to disputes between individual plot owners and the latter may be the most common type of dispute (Holden et al. 2011b; Holden and Tefera 2008) and possibly the main factor affecting individual WTP for Second Stage certification.

2.5. National and international support for land administrative reform in Ethiopia

Tigray region financed the First Stage land registration and certification without any outside assistance. International researchers have been involved in evaluating the impacts of the First Stage reform in Tigray. SIDA has provided support for high quality registration and certification in selected areas (East Gojjam and South Wollo) in the Amhara region. USAID has provided support among others for piloting Second Stage certification in selected districts in the four regions Tigray, Amhara, Oromia and SNNP through the Strengthening Ethiopian Land Tenure and Administration Program (ELTAP) project that lasted from 2005 to 2008 and the following program, the Ethiopia Strengthening Land Administration Program (ELAP), that lasted from 2008 to 2013 (USAID 2010). The Second Stage certification under these programs has used low-cost handheld GPSs with lower level of precision (5-10 meters) than the much more costly but accurate technology used by the SIDA-sponsored program in Amhara region. These programs also contributed to help strengthen the legal frameworks and to train Ethiopian land administrations at different levels. Administrative capacity, however, remains a major bottleneck for scaling up Second Stage land certification and emphasis should be given to identifying the locations where such upgrading is most needed and gives the highest returns.

3. Theoretical model for continuous formalization

Theoretically, we may think of a continuum of formalization intensity and quality where the intensity and quality is increasing with the cost of formalization. However, intensification in terms of increasing the number of rights or the strength of these rights, is different from the intensity in precision in terms of e.g. accuracy of border demarcation and accuracy of maps (Sjaastad and Bromley 2000). Technological advances have implied a reduction in costs of formalization to achieve the same quality or intensity of formalization when it comes to accuracy. This may be pictured as a forward movement of the formalization supply curve. Identification of the social optimal level of formalization quality and intensity requires identification of the formalization demand curve. This demand curve will shift out with the wealth of a society, the size and quality of land, as captured by the land value, or the *potential* value of land, the individual demand for tenure security, the extent of threat to such security and the extent to which formalized land rights are perceived to increase such security of tenure and thus enhance the expected associated land value. The demand may also depend on the expectations of and quality of other services provided by the land administrative system such as

fair conflict resolution in cases of land disputes and how well such a formalized system works relative to a traditional conflict resolution system. The demand may as well be influenced by the level of knowledge and thus realism of the expectations regarding the services that can be provided and the ability to utilize the benefits of the system. Furthermore, if formalization is also associated with strengthening statutory law this may have implications for whether the bundle of rights and obligations and their distribution is changed among land owners. For example, if formalization is combined with a new policy to strengthen the land rights of women within households, there is an element of redistribution which goes beyond recognizing the land rights that existed before the formalization. This may then affect the demand among old and new rights holders. With new laws and regulations that go farther in specifying land owner obligations as part of a formalization process, such as conservation obligations, and with the land owners learning about this through dissemination activities, it may also affect their demand for formalization. Likewise, if they perceive that formalization also is a basis for introducing a new tax on property, this may reduce their demand for such formalization.

In assessing the optimal land formalization quality level, it is important to assess the marginal benefits versus marginal costs of upgrading the formalization quality of land rights. As Deininger and Feder (2009) point out there are many examples of supply driven land formalization programs that were implemented based on lobbying by survey professionals and leading to too high technical standards compared to the demands for such formalization and the actual land values. Such programs may even have created competition with traditional tenure systems and have undermined these. This may also explain why some conventional land titling programs such as in Kenya and Madagascar have not resulted in any significant impacts (Migot-Adholla et al. 1991; Jacoby and Minten 2007) and others have resulted in speculative behavior that has created conflicts (Benjaminsen et al. 2009).

The precision level of plot border identification and mapping has a strong influence on the costs of land rights formalization. The costs of formalization increase exponentially with precision level (Deininger and Feder 2009). It is not obvious that a high precision level is worth the additional cost. The low-cost and participatory approach using neighbors as witnesses in the First Stage registration in Ethiopia provide a substantially higher precision level than use of low-cost GPSs that are more expensive and inaccurate. The added value of this technology is therefore not for purposes of border identification and protection against encroachment but for rough map creation and computerized registration. It is then appropriate to ask who should pay for such intensified formalization? It will depend on individual owners' willingness to pay for rough sketch maps. It is questionable whether such maps contribute to enhance tenure security. A computerized registry may facilitate easier bequeathing of land to the children but owners may not be aware of such benefits and it is uncertain whether that will enhance WTP much. It is likely that the benefits from computerization and mapping benefits are primarily social and to a small extent private.

To what extent are the marginal costs and marginal benefits private or social (externalities)? To what extent is it feasible to internalize such externalities? The tenure security effect of formalization is private and we should expect it to occur in the demand and WTP for registration and certificates. It is possible that the whole tenure security effect is included in the First Stage certification. This may also be the case for women in the household where there is joint certification. The Second Stage certificates may not contribute much to tenure security unless the First Stage certification was of poor quality in terms of establishing clear property borders and there is lack of witnesses for these borders. Low-cost GPSs do not add to the precision of plot border demarcation and the maps are too inaccurate to be useful in relation to solving plot border disputes.

The other broader benefits associated with land titling, such as credit access and transferability of land, are likely to be much less important in the restricted rights regime in Ethiopia. With the continued prohibition of land sales and mortgaging of land, the only hope may be higher land value through the land rental market unless informal sales could take place. Most land renting is also through sharecropping contracts and the share rate to the owner is typically less flexible than a rental price in a fixed rent contract. However, there is a possible advantage from land certification that a more tenure secure landowner can achieve a stronger position in the rental market and is better able to negotiate good contracts, evict bad tenants and select better tenants. Again, it is doubtful that these benefits will become stronger after Second Stage certification than they became after First Stage certification. This may imply that the WTP is higher for potential landlord households than households that do not consider renting out their land.

The new rural land law states that where land is jointly held by husband and wife or by other persons, the holding certificate shall be prepared in the name of all the joint holders (Federal land proclamation 456/2005)(FDRE 2005). This suggests that whether or not husbands and wives have both their names registered in the certificate may indicate legal status as joint holders of the land. The regional land use law of SNNPR (2007) clearly states that husband and wife are joint owners of their land holdings regardless of their pre-marriage individual land holding. The First Stage land registration and certification in SNNP region also reflects this by including the names of both husband and wife. Changes in the names registered on the Second Stage certificates may thus undermine or improve the ownership position of women depending on whether their names were or were not included on the First Stage certificates. If the First Stage certificate contains the name of only the husband in married households, the male heads may see an advantage of having only their name on the certificates and may thus have lower WTP for Second Stage certificates because it may strengthen their bargaining power over the land relative to their wives. The opposite holds if the First Stage certificate contains the names of both husband and wife. Erosion in the trust that the land certificate provides the security they want could happen if the government expropriates land without or with very low compensation. Such actions could easily reintroduce tenure insecurity in the minds of people.

Hypotheses:

1. Demand for and Willingness to pay (WTP) for upgrading to Second Stage land certification is low as there are few private benefits from such upgrading.
2. WTP is increasing with land value which again depends on land scarcity, land quality and market access.
3. WTP for upgrading increases over time because of erosion of benefits from First Stage land registration and certification due to the difficulty of maintaining the benefits of the low-cost approach.
4. WTP declines over time due to loss of momentum of the land registration and certification reform and reduced expectations about benefits from upgrading.
5. WTP is higher for households that have been exposed to information meetings.
6. WTP is higher for more tenure insecure households that lack witnesses for their plots due to poor quality implementation of the First Stage registration or have been exposed to land disputes.

These hypotheses will be tested with the following econometric model:

$$WTP2_{ht} = \beta_0 + \beta_1 A_{ht} + \beta_2 C_{ht} + \beta_3 RQ_{ht} + \beta_4 CY_{ht} + \beta_5 RQ_{ht} * CY_{ht} + \beta_6 MD_t + \beta_7 M_t + \beta_8 D_t + \vartheta_h + e_{ht}$$

Where $WTP2_{ht}$ is willingness to pay for Second Stage certificate for household *h* in period *t*, *A* is farm size, *C* is a dummy for exposure to land conflicts, *RQ* is registration quality, *CY* is land certificate information including how long the household has possessed a First Stage land certificate and whose name(s) is/are on the certificate, *MD* is distance to market, *M* is a dummy for whether the household has been exposed to information meetings about land certification, *D* is a year dummy, ϑ_h represents unobservable household factors, and e_{ht} is a random error term.

4. Description of land certification implementation

There are regional variations in the land laws and how land registration and certification have been implemented as briefly described below.

4.1 . Oromia

The land registration and certification in Oromia region started in 2003/04 by regional staff training district level land administration staff. Land Administration Committees (LAC) were established at community (*kebelle*) level with representatives from the villages (sub-*kebelles*). The district land administration trained some of the community level LAC staff and these again trained the remaining LAC staff and the community. Registration started by demarcating community and village borders, communal and public land. Individual land was demarcated and a form was filled in the field. Another form at household level was afterwards filled at community level. Complaints were dealt within the social court. Registration books as well as the certificates are prepared at district level while only the forms are kept at community level. Household heads provide photos (4 EB compulsory) before certificates are issued. Certificates

can be collected at the *kebelle* level at a price of 5 EB (Holden and Tefera 2008; Zevenbergen 2005).

The certificate contains the name of the household head under 'land holders' in the first line and the spouse name in the second line under 'name of spouse' followed by list of names of other household members. The certificate contains only the picture of household head. If it is a polygamous household, the photo of the husband appears only on one of the certificates for the household and land that he frequents or prefers and his name appears as 'land holder' only on that certificate. The other wives who live on separate plots will have a certificate for that plot or parcel with their name written under 'land holders' and their picture is attached instead of the husband. The name of the husband will be written in the second line under 'name of spouse'. If a polygamous household does not have separate land for each wife (not very common), all the wives' names will appear under the 'name of spouse' in a single certificate. The facts that only the photo of the husband is attached on the certificate and that only his name is written under 'name of holder' (in monogamous households) seem to suggest that the First Stage certificate identifies the household head, typically men, as primary land holders. Nothing is written under the privileges and right sections of the certificate to suggest that both the husband and wife have equal right on the land unlike the case for SNNP as we see below.

The Second Stage registration is carried out by trained surveyors and registrars. The surveyors and the registrars work together to take GPS measurements, prepare temporary sketches in the field, prepare the map on the computer and to combine plot level measurements with household information. The Second Stage plot level certificates are produced on water resistant papers showing the names of both husband and wife, size of plot , GPS coordinates , map of the plot, unique plot code and the plot code and holder names of the neighboring farms.

Second Stage land registration has been carried out in some selected districts and communities and some of the households have received the new land certificate with plots maps. Households are expected to bring their First Stage certificate when they collect the Second Stage parcel based certificates from the community administration office. After confirming for identity, the farmers are given both certificates. According to the officials in the zone and district the labor costs of Second Stage land registration and certification is about 17 Birr per parcel (1USD). This includes the wage of surveyors and registrars who are engaged on contract basis. The regional government is funding the pilot areas and priority areas where Second Stage registration and certification takes place. Donor support has been received for pilot areas. So far, households were not asked to pay fee for Second Stage certificate. The next plan is to scale up to cover all areas in the region but it is not clear where the funding will come from and whether households will start paying for the Second Stage certificate. Additional donor funds may, however, also become available for funding of this activity soon as both DFID and the World Bank are implementing new programs in this area.

In summary there is some variation between the First and Second Stage certificate in terms of signaling joint land holding of husband and wife. In the First Stage certificate only the name of the household head is written under land holder name. Wives name is typically written under 'spouse name' unless the household is female-headed. The certificate contains only the household head's picture, typically the husband's picture in married households. On the other hand, in the Second Stage certificate the name of both household head and spouse are written side by side under name of holders. And no picture is attached. This may indicate towards a more equal representation of 'ownership' between husband and wife in the Second Stage certificate in Oromia. An important question is, however, whether and when or how wives get their names on the certificates.

4.2. SNNP

Before the first land registration, a needs and demand assessment was carried out in each district. Pilot locations were selected in 2004. Awareness workshops were held at district level. Training in registration was held for district level land administrations. Community level Land Administration Committees (LACs) and Development Agents (agricultural extension staff) were established and trained. Demarcation of individual land proceeded based on the assumption that community and public land borders were known. Complaints and disputes were handled locally and if necessary by district courts. Registry books were prepared at the community level. District level books were made but only contained summarized information at household level from the community level books. Land certificates are prepared and signed at the district level while photos are added at the community level and stamped. The cost of certificates were 2 EB as card fee plus the cost of photos of 4 EB per photo (Holden and Tefera 2008; Zevenbergen 2005). However, in practice the card fees were often not collected. In SNNP the certificate is supposed to contain the names and photos of both the husband and wife side by side. While in Sidama this has been almost always adhered to, in Wollaita one or both photos were missing in most cases. Under the rights and responsibilities section of the certificate it was indicated that both husband and wife have equal rights on the land.

First Stage land certification has discontinued or never commenced in some communities in Sidama where the Second Stage registration has started through pilot projects. One of the districts under our survey, Wondo Genet, has been selected for ELTAP pilot project. Only 30% of the households in this district received the First Stage certificate so far.

The ELTAP pilot project implemented land registration and certification with more sophisticated technology (GPS, computerized registration, mapping) in 24 selected districts (6 per region) and aimed to complete these in three years (2005-2008) (Holden and Tefera 2008). However, there were delays in the implementation in these pilot areas and some of them were registered under a follow up project, ELAP (2008-2013). In Wondo Genet district, Second Stage registration for selected communities is now at 97% but only 6 of the 8 selected communities distributed the certificate. Households are issued with one card listing all the plots and containing the names of both household head and spouse as holders and separate maps for each plot. Like the case for

Oromia, households in SNNP do not pay for the certificate. Most of the cost for the certificate was covered through the ELTAP/ELAP project but the regional government also covered part of the cost for the communities that were not included in the selected districts. As opposed to the case in Oromia where households are able to retain both the First Stage and the Second Stage certificates, in SNNP households return the First Stage certificate when they receive the Second Stage certificate. Land administration officials seem to believe that the First Stage certificate is obsolete once a Second Stage land registration and certification is carried out. This may also explain why they suspended First Stage registration in pilot districts.

In summary, the Second Stage certificate in SNNP is not different from the First Stage certificate in terms of joint certification as it contains the names of both household head and spouse and clearly states that husbands and wives have equal rights.

5. Data and methods

A stratified random sample of 600 households in five districts in Oromia and SNNP regions was surveyed in 2007 and 2012 just after or during the First Stage land registration and up to six years after the First Stage land registration and certification. Locations were stratified to capture the differences between the two regions, differences in agro-ecosystems (cereal-based crop-livestock system, perennial system with irrigation and cash crops, and perennial system without irrigation and with subsistence orientation. In addition communities were selected with varying distance to the district centre (varying market access and urban expansion pressure).

In these two regions land certificates were allocated jointly to husbands and wives and therefore aimed to strengthen the land rights of women. It is possible that this gender focus has affected the WTP for Second Stage certificates. The WTP questions were hypothetical. The questions were addressed to the head of the household as well as to wives in male-headed households. Households were asked about their maximum WTP for First Stage certificates if they lost theirs or did not have one. And they were asked about their maximum WTP for Second Stage certificates that they have not yet received. Payment in cash as well as in labor was used to measure WTP for Second Stage certificates. It is possible that such questions lead to an overestimate of the demand for Second Stage land certification. The numbers should therefore be interpreted with that in mind. The WTP cash amounts were inflation adjusted to make the results in the two survey rounds comparable with the 2006 value for Ethiopian Birr (EB) used as the base[1].

6. Descriptive statistics

Table 1 shows that the land of 94% of the households has been registered and 74% have received First Stage land certificates in 2012. As much as 98% state that they want a First Stage

[1] The exchange rate with US$ was 8.4 EB in June 2006

certificate. When it comes to the demand for Second Stage certificates, only 54% stated that they wanted such a certificate and this demand has declined from 71% in 2007. This could imply that they feel that the First Stage certificate is sufficient and that their confidence in this certificate has grown over time. Household may be also wary of displacement if they associate the second round measurement and registration with possible land take over by the state for urban expansion. This is particularly noticeable in Shashemene district, which is very close to the town municipality and also experienced land expropriation before. Fear of tax increase may also be another reason for decline in interest. This has to do with irregularities in First Stage measurement and reporting. Some households reduce the amount of land reported to authorities in the hope of paying smaller tax. During the Second Stage registration, a number of such cases have been uncovered in Oromia, for example, indicating to a possible corruption during the First Stage registration. Finally, the table also includes a response to whether they would be willing to sell their land if it became legal. For this variable there was a decline from 31% in 2007 to 11% in 2012 indicating that land has become dearer to them.

Table 1. Household land certification status and demand for Second Stage certificate, Oromia and SNNP

	2007		2012	
	Percentage	N	Percentage	N
Households whose land is registered	0.91	551	0.94	619
Households who have land certificate	0.68	576	0.74	616
Households who would want First Stage certificate *	0.93	496	0.98	556
Want Second Stage certificate with maps for each plot	**0.71**	530	**0.54**	610
Willing to sell land if it becomes legal	0.31	572	0.11	610

* For those who already have certificate the question is hypothetical "Would you want to obtain a certificate if you didn't have one?"

Table 2 presents median inflation corrected WTP for first and Second Stage certificates in 2006 EB. The median WTP for First Stage certificate has declined from 5.8 EB in 2007 to 3.4 EB in 2012 while the median WTP for Second Stage certificate has declined from 9.6 EB in 2007 to 3.4 EB in 2012. This is still higher than the official fee requested for the card in both years. The alternative median measure in the form of maximum WTP in labor days for Second Stage certificates has also declined from 3 to 2 man-days from 2007 to 2012. On the contrary, the inflation corrected value of land has increased very much in this period. The minimum willingness to accept (WTA) as compensation in case of loss of the land holding (per hectare) increased four to six fold in the five years between the two years. This gives good reasons to question why we see this significant decline in WTP not only for Second Stage certificates but also for First Stage certificates.

Table 2. Real value of land and land certificate in 2006 Birr and in labor days

	2007		2012	
	Median	N	Median	N
Maximum WTP for First Stage certificate	5.75	465	3.36	549
Maximum WTP for lost First Stage certificate	5.75	453	3.36	572
Maximum WTP for Second Stage certificate in Birr	9.59	356	3.36	331
Maximum WTP for Second Stage certificate in labor days	3.00	355	2.00	336
Minimum compensation considered fair if land is demanded for public service (in Million EB per hectare)	0.11	338	0.45	385
Minimum price to sell land (in Million EB per hectare)	0.11	424	0.67	260

Table 3 provides more qualitative information on the interest in First Stage and Second Stage land certificates by year and by district. The two first districts (Sashemene and Arsi Negelle) are in Oromia region, have cereal-based production without irrigation but good market access. One of the two other districts is Wondo Genet which is a high potential perennial zone with cash crops, irrigation and good market access. This district was also selected by ELTAP for Second Stage certification. Wollaita is a low potential perennial zone with poorer market access and very high population density. We see that there is high demand for First Stage certificates in all four districts while the demand for Second Stage certificates is a bit more modest and there seems to be a decline in the interest in from 2007 to 2012 in all zones except Wollaita.

Table 4 provides additional data on median WTP in 2007 and 2012 in the same four districts. It can be seen that the median WTPs have declined from 2007 to 2012 in all districts and particularly so for Second Stage certificates. The table also contains median land values in million EB as fair compensation in case of land taking or as acceptable selling price if land sales were allowed. Here we see a sharp increase in land values from 2007 to 2012 and particularly so in Sashemene district, where rapid urbanization is taking place. Wondo Genet, the cash cropping area with irrigation had the highest land values in 2007 but land values had increased relatively less there than in the other areas from 2007 to 2012. The fact that Wondo Genet had been targeted with Second Stage land certification through the ELTAP/ELAP project seems not to have stimulated the interest in or WTP for Second Stage certification in this cash cropping area. A reason could be that people already feel tenure secure. In Sashemene there has been land takings related to urban expansion but it seems not to have affected the WTP for Second Stage certificates. This could also indicate that households do not perceive that these certificates give

Table 3 Households in the sample who say they are interested in obtaining land certificate. Disaggregated by district and year

	Shashemene		Arsi Negele		Wondo Genet		Wollaita		Total
Interest in land certificate:	2007	2012	2007	2012	2007	2012	2007	2012	
First Stage land certificate, % Yes (N=sample size)	97 (135)	99 (121)	96 (138)	100 (127)	93 (54)	100 (132)	88 (169)	95 (176)	96 (1052)
Second Stage certificate with maps for each plot, % Yes (N=sample size)	92 (149)	50 (132)	73 (150)	59 (140)	58 (40)	48 (135)	56 (191)	57 (203)	62 (1140)

Table 4 Median Willingness to pay for land certificate and median land values, disaggregated by district and year

	2007				2012			
	Shashemene	Arsi Negele	Wondo Genet	Wollaita	Shashemene	Arsi Negele	Wondo Genet	Wollaita
Maximum WTP for lost certificate	5.75	9.59	9.59	4.79	3.70	6.72	6.72	3.36
Maximum WTP for First Stage certificate	9.59	9.59	4.79	3.84	3.36	6.72	6.72	3.36
Maximum WTP for Second Stage certificate	9.59	19.18	9.59	9.59	3.36	5.04	5.38	3.36
Minimum compensation considered fair if land is demanded for public service (in Millions EB)	0.10	0.11	0.45	0.07	0.90	0.45	0.85	0.27
Minimum price to sell land (in Millions EB)	0.10	0.12	0.45	0.07	1.34	0.74	0.67	0.45

Note: Figures are median WTP in 2006 Ethiopian Birr.

Table 5. Women's and men's response to whether they think a Second Stage certificate is a good idea (from 2012)

	Women		Men	
	Freq.	Percent	Freq.	Percent
Indifferent	157	25	77	15
Good	215	34	231	46
Bad/unnecessary	262	41	194	39

Table 6. Women's and men's current interest on Second Stage certificate and their First Stage certificate experience

	Women's preference for Second Stage certificate				**Men's preference for Second Stage certificate**			
	Interested		Not interested*		Interested		Not interested	
	Proportion	N	Proportion	N	Proportion	N	Proportion	N
Experience land dispute after First Stage	0.10	215	0.10	419	0.14	231	0.09	271
Perceived benefits from First Stage land certification								
Improved tenure security	0.69	215	0.53	419	0.78	231	0.62	271
Improved land conflict resolution	0.67	215	0.50	419	0.71	231	0.53	271
More discussion within household	0.58	207	0.55	403	0.60	223	0.58	259

Note: * Not interested indicate those women and men who said they are indifferent to Second Stage certificate and those who think it is a bad idea

them any additional security or more reliable information about where the plot borders are located.

Table 5 provides gender disaggregated information about interest in Second Stage land certificates. It can be seen that a smaller share of women (34%) than men (46%) perceived Second Stage land certificates as a good thing

Table 7. Median land values (minimum acceptable compensation in '000 Birr) per farm

	2007		2012		Median Ratio 2012/2007
District	Median	N	Median	N	
Shashemene	99	81	1344	43	13.6
ArsiNegelle	105	69	448	55	4.2
Wondo Oromia			246	21	
Wondo Genet	454	70	848	94	1.9
Wollaita	73	159	269	177	3.7
Total	**106**	**379**	**448**	**390**	**4.2**

Note: Wondo Oromia was administratively reallocated from Wondo Genet to a new district under Oromia region.

Table 7 gives an overview of the changes in farm level median land values per farm by district from 2007 to 2012. There is very high increase in the stated minimum acceptable compensation prices in this period. We cannot rule out strategic bias in these responses but such a strategic bias should also have been there in 2007. In the following econometric analysis we log-transform these values to reduce the effect of outliers. We see that the median value has increased twenty times in five years and think that this is demonstrating the accelerating effect of land scarcity due to population growth and market development. The increase has been highest in Sashemene district where urbanization is most rapid and where many households have experienced land takings. A significant share of the sample refused to give a value to the land as a kind of rejection of acceptance that land can be taken or sold. We therefore resorted to assessing the results on a truncated sample of those that were willing to give a response.

7. Econometric analyses and discussion

Table 9 provides the results from the econometric (panel tobit) models of factors associated with Willingness to pay for Second Stage land certificates in form of cash (deflated to 2006 EB) and labor (mandays). Tobit models were used as a substantial share of the respondents is not willing to pay anything. We see that 398 and 410 observations out of 970 were left censored for payment in cash and labor respectively. This means, however, that the majority are willing to pay a positive amount for Second Stage land certification although the median amounts were low as we saw in the descriptive statistics.

We will now assess our hypotheses listed in the theory section. To assess hypothesis 2 we first analyze factors associated with stated land values (minimum compensation values) as the hypothesis stated that these depend on land scarcity, land quality and market access. The most

important factor determining land quality is irrigation access which is found in one of the districts, Wondo Genet, where cash crops such as sugar cane and coffee are grown. The importance of land scarcity can be assessed by including the farm size. Wollaita has very small farm sizes but also poorer market access than the other districts, two factors that pull in opposite direction. Interactions between district dummies and farm size may tease out the combined effects of market access and farm size/land scarcity. To further explore the land scarcity issue we use land per capita (farm size/household size) as this may be a better measure of land scarcity for subsistence production. This variable is also interacted with district dummies. The results are presented in Table 8 for the truncated sample of households that were willing to state a minimum acceptable compensation value for their land.

We see that Wollaita has significantly (at 0.1% level) lower land values than the other districts even though it may have the highest land scarcity but poor market access and high level of poverty. The differences between Wondo Genet, Sashemene and Arsi Negelle are smaller, the larger farm sizes in Sashemene and Arsi Negelle seem to compensate for the higher land quality in Wondo Genet and vice versa. The farm size variable is significant at 10% level and positive in the first model. The table is in elasticity form. A doubling of farm size increases the value of the farm by 30%. This shows that land scarcity affects the perceived acceptable compensation values for land. But market access and land quality have stronger impact on perceived land values.

The other very strong effect is the increase in land values from 2007 to 2012 of 185% in a setting where sales markets for land are prohibited but where illegal sales are happening. Urbanization, economic growth and population growth are likely to jointly contribute to this.

Having received a land certificate was not significantly correlated with land values but households where the male head was the only person whose name was on the certificate had about 6% higher land values (significant at 5 and 10% levels in the two models). Female-headed households had 8-10% lower land values than other households (significant at 5% levels in both models).

After having established these important variations and changes in land values we now look at how they are related to the Willingness to pay for Second Stage land certificates in the truncated sample of respondents that were willing to give us the minimum acceptable compensation values for land. Responses in elasticity form are presented in Table 9.

The first striking and surprising results is that the WTP for Second Stage land certificates in cash and in labor are negatively correlated with land values. The correlations are significant at 5% levels in both models. The second striking result is that the WTP has declined significantly from 2007 to 2012. Households in Wondo Genet and Wollaita, the two densely populated areas, have lower WTP than Shashemene, significant at 0.1% . However, the trend is less negative in Wondo Genet. This is a district where the ELTAP and ELAP projects have attempted to introduce the more advanced land registration and certification and where land values are the highest.

Some of the other significant results include a significant positive correlation between WTP and respondents having participated in public meetings the process before land registration. The WTP was 47% and 28% higher in cash and labor for such households (significant at 1% and 5% levels). Having a land certificate was not significantly associated with WTP for Second Stage certificates but households having the name of only the husband on the certificate had a significantly lower WTP for Second Stage certificates. We may speculate that male heads of households perceive there to be an advantage of keeping the certificate which contains only their name instead of the Second Stage certificates that may include both the husband's and his wife's names. Finally, experience with land disputes before land registration was positively associated with WTP for Second Stage certificate in the model with payment in labor (significant at 5% level).

To further test the robustness of these results when dropping the land value variable and therefore eliminating a possible attrition bias related to unwillingness to give land values, we present models with the larger sample without land values in Table 10.

We see that the key results remain stable. The negative trend in WTP from 2007 to 2012 is even stronger and particularly so in Shashemene but this could be due to the recent land expropriation by the government for urban expansion that might have created insecurity. Participation in public meetings before registration remained positively related to WTP for Second Stage certificate although the elasticities declined. The same was the case for households with certificates with the name of husbands only and who had a lower WTP for Second Stage certificates. Previous experience with land disputes became significant (at 5% levels) and positive in both models, indicating that conflict experiences may be related to tenure insecurity and thus a higher demand for certificates beyond what the First Stage certificates have provided. Finally, age of household head was negatively associated with WTP (significant at 10 and 5% levels) which could be because older heads feel more tenure secure but there could also be other reasons.

To sum up the assessment of our hypotheses, we cannot reject hypothesis 1, as we found on average low WTP for Second Stage certificates and that the WTP is substantially lower than the administrative costs of implementing Second Stage certification.

We have to reject the first part of hypothesis 2 that WTP increases with land values as we found a significant negative correlation between these. The second part stating that land values increase with land scarcity, land quality and market access could not be rejected. Our findings fitted very well with this.

We have to reject hypothesis 3 that WTP increases over time. We found no signs that there has been a deterioration of the effect of the First Stage certification. However, we found lack of clarity in what the envisioned relationship between First Stage and Second Stage certificates is. While in Oromia the two certificates seem to supplement each other, in SNNP the Second Stage

certificate completely replaces the First Stage certificate although some information such as pictures of holders is missing from the new certificate.

We could not reject Hypothesis 4 that WTP has declined over time although we may not have succeeded to identify exactly all the reasons for this. Loss of momentum and interest may be a part of it. More realistic expectations may be another. However, the Second Stage certification may also be associated with fears of land expropriation and land taxation and may have been implemented in areas facing more dynamic developments with land use changes such as urban expansion and such changes may also lead to tenure insecurity and it appears that it is not expected that the Second Stage certificates provide additional protection.

We cannot reject hypothesis 5 that WTP is higher for households that have been exposed to information meetings about land registration and certification. It is clear that those who participated in such meeting had a significantly higher WTP for Second Stage certificates. This may not only be an information effect, however, it could also be a demand effect as those demanding more documentation of their land rights were also more likely to attend meetings about it. The information meeting we have in the analysis mainly refers to awareness creation meetings in the First Stage registration and certification. Our assessment from our discussions with farmers, development agents and officials is that as opposed to the case for First Stage land registration and certification there was not much awareness creation activity now on the new land registration and certification and there is not much interest for an open and transparent discussion on this with farmers and other stake holders.

We cannot reject the part of hypothesis 6 that states that WTP for Second Stage certificate is higher for those who are more tenure insecure because of exposure to land conflicts. Such households were found to have significant higher WTP for Second Stage certificates. On the other hand, the other part of the hypothesis, that WTP for Second Stage certificates is higher for those who lack witnesses to confirm plot borders, had to be rejected. This may be either due to no lack of such witnesses (indicating that First Stage registration and certification solved the problem) or no belief that the quality of Second Stage certificates is such that it can resolve this problem. This is in line with our suspicion that the accuracy level of the Second Stage certificates is too low to help in case of such problems and households may be aware of this.

Finally, we cannot reject hypothesis 7 that male household heads have a higher demand for Second Stage land certificates because these contain the name of the head of household only and not the name of the wives. This may explain why the demand for Second Stage certificates is lower for female-headed households and for male-headed households where only the name of the husband is included on the First Stage certificate.

8. Conclusion

Our study has revealed a relatively low demand for and WTP for Second Stage certificates. The perceived added value of these Second Stage certificates is considered to be low. The impression

is that they do not contribute much to enhance tenure security as compared to First Stage certificates unless something went wrong in the First Stage certification. However, most households perceived that they had sufficient witnesses in the neighborhood that could help in verifying the correct placement of plot borders. Inaccurate maps created based on measurement by handheld GPSs provide less reliable information on the location of plot borders. The fact that we noted a significant reduction in WTP for Second Stage certificates from 2007 till 2012 while perceived land values increased dramatically in the same period may show that First Stage certification has been successful in creating the demanded tenure security. The demand for Second Stage certificates comes primarily from the Land Administrations as it can provide a better basis for Land Administration and produce public documentation of land-related affairs. At the same time Second Stage registration and certification is costly and time demanding and there are reasons to question whether the public benefits are higher than the costs. Weaknesses in First Stage registration and certification in certain areas is not itself a sufficient argument for implementation of a Second Stage registration and certification but rather for redoing the much cheaper and faster First Stage registration where it was initially executed in a sloppy way.

Caution should also be taken so that Second Stage certification does not undermine the positive effects of Frist stage certification such as the joint certification of husbands and wives. It is important that all Second Stage certificates also include the names of both spouses and not just the name of the head of the household. However, we think that more pilot testing of Second Stage certification is needed and it may be useful in specific areas such as areas with rapid urban expansion and may be used to get a better coordination of urban and rural land registration and certification in ways that can enhance the tenure security of land holders and ensure appropriate compensation in cases of land expansion. However, more accurate maps based on even more expensive technologies may be needed in such areas, although technological improvements may also reduce the costs and make high quality mapping affordable. Continued economic growth may also make such improved land administrative systems affordable.

Table 8. Factors associated with land values (minimum compensation values), elasticities

	Model 1			Model 2		
	Elasticity		St. Err.	Elasticity		St. Err.
Experience land dispute before land registration	0.019		0.059	0.011		0.059
Have sufficient witnesses to confirm plot borders	-0.374		0.255	-0.340		0.254
Household has land certificate	-0.093		0.179	-0.089		0.178
Only husband's name on the certificate	0.064	**	0.032	0.059	*	0.032
Attended public meeting before land registration started	0.179		0.164	0.180		0.163
Female headed household	-0.088	**	0.042	-0.097	**	0.042
Age of household head	-0.044		0.294	-0.028		0.289
Total number of male members	0.306		0.230	0.215		0.192
Household size	-0.423		0.322			
Year dummy, 2012=1	1.854	****	0.116	1.847	****	0.114
Shashemene	-0.104		0.091	-0.129		0.089
Arsi Negelle	-0.078		0.069	-0.110	*	0.064
Wollaita	-0.944	****	0.202	-0.866	****	0.187
Oromia Wondo Genet (2012 only)	0.001		0.031	0.012		0.030
Farm size in ha	0.299	*	0.174			
Shashemene X Farm size	0.046		0.077			
Arsi Negelle X Farm size	-0.032		0.035			
Wollaita X Farm size	0.047		0.109			
Oromia Wondo Genet X Farm size	-0.024		0.025			
Land per capita, ha				0.221		0.145
Shashemene X Land per capita				0.081		0.070
Arsi Negelle X Land per capita				-0.010		0.028
Wollaita X Land per capita				-0.016		0.094
Oromia Wondo Genet X Land per capita				-0.036		0.024
Constant	11.729	****	0.562	11.362	****	0.548
Sigma constant	2.333	****	0.066	2.345	****	0.066
Prob > F	0.000			0.000		
Number of observations	620			619		

Note: Truncated tobit models. Significance levels: *: 10% level, **: 5% level, ***: 1% level, ***: 0.1%.
Dependent variable: Log of land value in EB. The table presents elasticities for the variables.

Table 9. Factors associated with Willingness to pay for Second Stage certificate in cash and in labor, censored panel tobit models with land values

	Willingness to pay in cash (birr)			Willingness to pay in labor (mandays)		
	Elasticity		St. Err.	Elasticity		St. Err.
Household farm size (hectares)	-0.026		0.090	-0.024		0.062
Experience land dispute before land registration	0.069		0.049	0.077	**	0.033
Have sufficient witnesses to confirm plot borders	0.050		0.211	0.055		0.145
Household has land certificate	0.144		0.149	0.157		0.103
Only husband name on the certificate	-0.064	**	0.028	-0.058	***	0.020
Attended public meeting before land registration	0.471	****	0.139	0.280	***	0.095
Female headed household	-0.019		0.035	-0.028		0.024
Age of household head	-0.096		0.247	-0.126		0.169
Total number of male members	-0.030		0.193	0.139		0.131
Household size	0.374		0.268	0.120		0.183
Log-transformed land value	-0.068	**	0.034	-0.057	**	0.023
District dummies, Baseline=Sashemene						
Arsi Negelle	-0.037		0.057	-0.037		0.039
Wondo Genet	-0.422	****	0.079	-0.191	****	0.050
Wollaita	-0.774	****	0.153	-0.480	****	0.105
Oromo Wondo Genet, 2012 only	0.011		0.015	0.004		0.011
Year 2012, dummy	-0.647	***	0.226	-0.312	**	0.155
Arsi Negelle X 2012	0.001		0.041	0.006		0.028
Wondo Genet X 2012	0.264	****	0.069	0.085	*	0.045
Wollaita X 2012	0.200		0.129	0.142		0.088
Constant	5.991	****	15.581	6.596		4.465
Sigma constant	47.918	****	1.801	13.725	****	0.518
Prob > F	0.000			0.000		
Number of observations	620			620		
Number of left censored obs.	247			252		

Note: Censored tobit models for truncated sample with land values. Significance levels: *: 10% level, **: 5% level, ***: 1% level, ***: 0.1%.

Table 10. Comparison of factors associated with Willingness to pay for Second Stage certificates in cash and in labor, censored tobit models without land values

	Willingness to pay in cash (birr)			Willingness to pay in labor (mandays)		
	Elasticity		St. Err.	Elasticity		St. Err.
Household farm size (hectares)	-0.061		0.061	-0.055		0.042
Experience land dispute before land registration	0.081	**	0.040	0.057	**	0.027
Have sufficient witnesses to confirm plot borders	-0.020		0.179	-0.116		0.122
Household has land certificate	-0.005		0.135	0.046		0.093
Only husband name on the certificate	-0.049	**	0.023	-0.049	***	0.016
Attended public meeting before land registration	0.395	***	0.121	0.202	**	0.082
Female headed household	-0.014		0.030	-0.034		0.021
Age of household head	-0.364	*	0.209	-0.279	**	0.142
Total number of male members	-0.022		0.169	0.008		0.115
Household size	0.226		0.232	0.260		0.158
District dummies, Baseline=Sashemene						
Arsi Negelle	-0.138	**	0.062	-0.112	***	0.042
Wondo Genet	-0.393	****	0.064	-0.180	****	0.040
Wollaita	-0.653	****	0.096	-0.390	****	0.065
Oromo Wondo Genet, 2012 only	-0.001		0.013	-0.004		0.009
Year 2012, dummy	-0.950	****	0.155	-0.525	****	0.106
Arsi Negelle X 2012	0.076	*	0.045	0.066	**	0.031
Wondo Genet X 2012	0.271	****	0.056	0.098	***	0.036
Wollaita X 2012	0.289	****	0.076	0.194	****	0.052
Constant	2.068	****	0.369	1.228	****	0.251
Sigma_constant	1.886	****	0.062	1.278	****	0.042
Prob > F	0.000			0.000		
Number of observations	958			958		
Number of left censored obs.	392			403		

Note: Censored tobit models. Significance levels: *: 10% level, **: 5% level, ***: 1% level, ***: 0.1%. Coefficients are presented in elasticity form.

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