

Household perception and demand for better protection of land rights in Ethiopia

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ABSTRACT

The study assesses factors that explain households' perceived tenure insecurity and the demand for new formalization of land rights in Ethiopia. We use data from the 2013 Agricultural Growth Program (AGP) survey of 7,500 households from high agricultural potential areas of Ethiopia. The results from a logistic estimation and a descriptive analysis reveal that the demand for further land demarcation is positively associated with higher perception of tenure insecurity. Moreover, disaggregated regression results indicate that *ownership* and *boundary-related disputes* characterize peri-urban locations and vibrant communities, whereas perceived risk of government expropriation of land is mainly manifested in predominantly rural communities and areas where administrative land redistribution is a recent practices. Hence, the rollout strategy for the recent wave of the Second-Level Land Certification agenda should avoid a blanket approach, as it can only be considered a best fit for those vibrant and peri-urban locations where demand for further formalization is higher and boundary and ownership-related disputes are more common. However, focusing similar interventions in predominantly agrarian communities and communities with recent administrative land distributions may not be advisable since expropriation risk seems to be dictating perceived tenure insecurity of households in such locations. Rather, regulatory reforms in the form of strengthening the depth of rights over land, such as formalization of rural land lease markets and abolishing conditional restrictions on inter-generational land transfers via inheritance or gifting, could be considered as alternative and cost-effective intervention packages in this latter context.

Keywords: land certification, tenure insecurity, land policy, Ethiopia

I. INTRODUCTION

A new wave of land reforms has hit Africa. These efforts aim to provide more private land and to secure property rights for those who occupy the land. Formalization of land rights are being promoted by the Commission for Legal Empowerment of the Poor, the World Bank, UN organizations, and many donor organizations. Ethiopia surpassed expectations when it implemented one of the largest, fastest, and cheapest land registration and certification reforms in Africa (Deininger et al. 2008). While arduous in nature, there is growing evidence that land certification and registration programs have led to an increase in investment, improved land productivity and land rental market activity (Holden et al. 2007, 2011; Deininger et al. 2011; Bezabih et al. 2012). Positive welfare effects in the form of greater food availability and improved child nutrition have also been identified from these programs (Hagos and Holden 2013).

Formalization of land rights is a dynamic process. As experimental or implemented land reform programs get underway, they require updating with improvements or need to be modified to fulfill new economic and societal needs. While evidence of the positive impacts of land reforms continue to emerge in terms of increased investment, land productivity, and land rental market activity, the government of Ethiopia has started a new second round effort to computerize the registration of land parcels in every part of Ethiopia. The relevance of the second-level certification relies both on increasing demand for formalization as well as decreasing demand for first-level land certification due to the deterioration of factors considered paramount to its success. In particular, general land parcel boundaries, such as natural structures like rivers, trees, etc., may have been altered by natural or artificial causes. Moreover, the witnesses of parcel borders may have moved away from the local area.

Using data from a nationally representative survey of 7,500 households from the four major agricultural regions of Ethiopia, this study strives to answer the following research questions:

- i) After receiving the first-level land certification, what is the demand for second-level land certification? What are the factors that determine its demand?
- ii) What factors determine the levels of tenure insecurity as perceived by households?
- iii) How does the second-level certification improve tenure security of farm households?

The results from both the econometric and descriptive analysis reveal that the demand for further land demarcation is positively associated with a higher perception of tenure insecurity. Our parcel-level descriptive analysis suggests a negative association between land registration and the likelihood of private land dispute. Furthermore, the results show that households who have experienced land parcel border disputes are more likely to demand new formalization of land. The proportion of rented-out parcels is lower where households perceive a risk of government expropriation of such parcels. Findings also indicate that there is significant variation among regions in terms of the predominant mode of land acquisition,

suggesting that land policy interventions should be context-specific. Policy interventions should take into consideration variation across regions in terms of mode of acquisition and implement the certification process accordingly.

2. BACKGROUND

2.1 Land Rights Registration and Certification Process in Ethiopia

Land titles are associated with full private property rights. In land markets in Ethiopia, the ownership of these land titles can be transferred or the titles can be used as collateral in order for the owner to obtain loans. The title is a written document providing proof of ownership. This ownership is recorded in a publicly recognized central land registry.

The Ethiopian Ministry of Agriculture (MoA - 2013) characterizes the first-level land certification as a process of providing farmers with simple temporary landholding certificates with no geo-referencing or mapping information of the land parcels. The MoA website describes that 6.3 million out of 13 million households have received such certificates in the four major agricultural regions of the country, Tigray, Amhara, Oromiya, and Southern Nations, Nationalities, and Peoples (SNNP) regions. The stated aim of the Ministry is to provide Stage One certificates to the remaining 6.7 million households and to scale up a land administration pilot program through which one million households are to be issued with permanent certificates that include geo-referencing and mapping of individual land parcels. This land administrative pilot program is referred to as Stage Two of the land certification program.

Any effort to reform land governance in Ethiopia must include further formalization of land use rights, including stipulations on land and land use transfer, such as through rental markets, conservation, and productivity. Elliott and Gibson (2012) highlight the benefits of improved land rights, which take place through three main channels: collateral value, labor mobility, and investment incentives. Ethiopia's development partners, in alliance with the Ministry of Agriculture, have been adamant about further formalization of individual land rights. With the end of the government's land reallocation practices in 2005, the process to formalize rights to land gained more ground as development partners took advantage of the opportunity to finance projects that raised awareness, increased the scale of operation, and promoted further certification of land parcels as a measure of improving the tenure security of smallholder farmers across Ethiopia. Many lessons have been learned. Having realized the perceived benefits of improved tenure security, the government has now committed to further collaboration with development partners to improve land governance, to scale up certification programs that are more detailed, to target weaknesses in the first-level land certification, to address gender disparities in land titling, and to increase efficiency in land rental markets (Elliott and Gibson 2012). In part, the agreement between the government of Ethiopia and the G8 alliance, the G8 Cooperation Framework to Support the New Alliance for Food Security and Nutrition in Ethiopia that was signed in December 2013 aims to support land tenure security for all. It seeks to strengthen transparency in land governance by, for example, promoting responsible agricultural investment through a better legal framework and practices.

The supporting literature on land tenure security in Ethiopia revolves around current policy dialogues and the effectiveness of the ongoing certification program. Feder and Nishio (1998) 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 also were found in Thailand, urban Philippines, urban Indonesia, Honduras, Paraguay, and Peru. However, a study in rural India (Pender and Kerr 1994) found no significant positive effects on investments 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 an investment in planting trees in one area in Ghana.

Feder and Nishio (1998) emphasize that many prerequisites have to be in place before positive economic and productivity impacts of land registration can be achieved. If there are weaknesses in existing formal or informal tenure systems, for example, this inhibits 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. Furthermore, land cannot be used as collateral by lending institutions unless there exists a well-functioning land sales market. Lawyers and land administration personnel who can implement the law, register the land, and create land titles in a transparent and reliable way 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 could result in land grabbing ("elite capture") by better informed, more influential, and more wealthy stakeholders. There are fears that this effect of formalizing land rights could increase landlessness and result in other negative effects on the poor. Corruption within the land administration functions may also undermine the benefits of a modern land registration

system should the staff responsible for its implementation take advantage of their positions. For a new system to gather popularity and succeed, engaging local participation in the process, along with simple, efficient, and transparent procedures are essential.

Both customary and statutory tenure systems have traditionally favored men over women in terms of land entitlement. 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 often have been ignored or otherwise not respected. The high cost of creating land titles has led many countries to establish a system of creating titles only upon demand, which has made land titles even more costly and only available to the wealthy (Benjaminson et al. 2009; Besley and Burgess 2000; Cotula et al. 2004; Deininger 2003). There is, therefore, a great need for more low-cost, broad-scale and egalitarian systems of land registration in low income countries.

The first-level land certification in Ethiopia registered the landholdings of many farmers in the four main regions. However, the first phase certificates poorly described the land plots, including neither a map nor any kind of spatial reference, and only provides a rough estimate of the area of the plots. None of the regions created sketches of the plots as part of the certification process. The size of the plot was determined either by using crude measurement methods or by relying on local estimates of the area of the plot in *timads*¹.

Implementation of the land certification program is conducted through Land Administration Committees (LACs) at *woreda* (district) level in five steps.

- i) The *kebele* (sub-district or community) land evaluation and registration process starts with information sent to the *woreda* and *kebele* administrations. Awareness campaigns are conducted among the local farmers. LACs are then established, and the committee members are elected and trained.
- ii) Farmers are encouraged to apply to the LAC for registration of their land by submitting their name, number of parcels, and total area claimed. The application also contains a description of present land use and requires that the names of the neighbors with land adjacent to each parcel be listed. The LAC verifies the information in the field and enters the checked information onto a field datasheet.
- iii) Based on the information collected, a temporary certificate will be issued to farmer and the results are publicly displayed. The farmers will then be gathered together and all applications will be announced in order that agreement may be reached.
- iv) The information from the field datasheets is registered in the land registry book which is kept at the *woreda* office.
- v) Finally, based on the information entered into the land register book, the *woreda* administration office issues a land registration book for each registered household (Bezabih et al. 2014).

Land certification in Tigray began soon after the land redistribution exercise of government. The process there involved the landholder and his neighbors being present at the plot when it was identified and measured. If no one was present, the plot would not be registered. In Tigray, the process also relied heavily on information collected during the last land distribution. In these cases where records were available, not all land was measured again. Moreover, the first-level land certification did not consider gender balance, such that the certificate was not in the name of both parties in the case of married couples (husband and wife), but only in that of the husband (Deininger et al. 2005).

The other three regions, Amhara, Oromia, and SNNP, continue to work towards increased tenure security. The process has been set up relatively quickly, especially in Amhara. In Oromia, strong reliance on community work has made the process very participatory. These efforts have been combined with well-established and supported training programs. However, the lack of simple sketch maps of plots during the first-level land certificate process has limited the impact of the process. Moreover, in Oromia and SNNP, the record book entries are small and condensed with only one line per household, leaving little room for any updating. Nonetheless, mainly using direct funding from the Federal Government, it is estimated that first-level rural landholding certificates have been issued to about 13 million rural households in Oromia, SNNP, Tigray, and Amhara (IFAD 2015)

¹ A traditional form of area measurement that equals the area an ox can plough in one day, around 0.25 ha.

2.2 Second-level land certification programs

Many donors have been engaged in the second-level land certification process. The Ethiopia Strengthening Land Administration Program (ELAP), funded by USAID from 2008 to 2013, continued the work that began under the Ethiopian Strengthening Land Tenure and Administration Process (ELTAP), extending certification and survey activities to new areas, including to Afar and Somali regions, which have considerable pastoral lands (ORGUT 2010). The components of the second-level land certification process were designed to strengthen tenure security, to improve systems pertaining to land dispute resolution, and to improve the effectiveness of land titling and administration by standardizing rural land registration and cadastral surveying methodologies. Finnish cooperation, another donor involved in rural economic development, is focused on the Responsible and Innovative Land Administration in Ethiopia (REILA). This supports the Government's land registration program, the Ethiopia Sustainable Land Management Investment Framework (ESIF). Since August 2011, the cooperation has been an ongoing bilateral project. REILA, which minimizes ground survey efforts by using aerial photographs and satellite images for parcel boundary definition, is expected to continue until 2016. This intervention will assist the second-level certification process to improve land administration and to increase capacity for investment in responsible land allocation.

Another on-going project to reform the land sector in Ethiopia is the DFID-funded Land Investment for Transformation (LIFT) program, which has been developed to improve incomes of the rural poor and to enhance economic growth through second-level land certification (LIFT report 2014). The LIFT program is intended to work with other partners, such as REILA, focusing primarily on raising awareness among landholders, and building capacity of senior officials at federal and regional levels, and also at woreda and kebele levels, including LAC members. Some of the woredas included in the LIFT program are also those included in the Agricultural Growth Program (AGP) which were selected by the Ethiopian government due to their high potential for agricultural growth. The LIFT program intends to cover up to 14 million parcels in approximately 140 woredas. The government's budget allocation formula was used to allocate the numbers of woreda to be selected in each of the four main regions. The distribution consists of 39 woredas in Amhara, 54 in Oromia, 34 in SNNP, and 13 in Tigray. The selected woredas are grouped in clusters of AGP and SLMP (Sustainable Land Management Program) woredas, with other selected woreda being those with ortho-photo coverage (LIFT report 2014). According to the LIFT report, the estimated cost per registered parcel is US\$5.88. This figure falls below the cost of the REILA pilot second-level certification trials.

Implementing the second-level land certificate at country level is not cost effective and optimal for two reasons. First, for reasons related to budget. Pilots with cadastral mapping have been undertaken mainly in Amhara, including a donor-assisted (SIDA) project using advanced GPS-equipment and GIS supported mapping functionalities. Costs appear high when scaling up this approach. Therefore, expanding the pilot program to all four regions is not envisaged under the USAID-assisted project (Deininger et al. 2005). Consequently, for efficiency in program implementation, identifying the households and parcels with high tenure insecurity and less confidence to invest on their farm land should be given priority. Second, the demand for the second-level land certification varies among regions.

The LIFT project is now at an early stage of implementation in some of the AGP woredas. Thus, the main contribution of this paper is to provide evidence-based insights for policy makers and donors in order to help identify the areas where maximum benefit from second-level land certificate might be achieved.

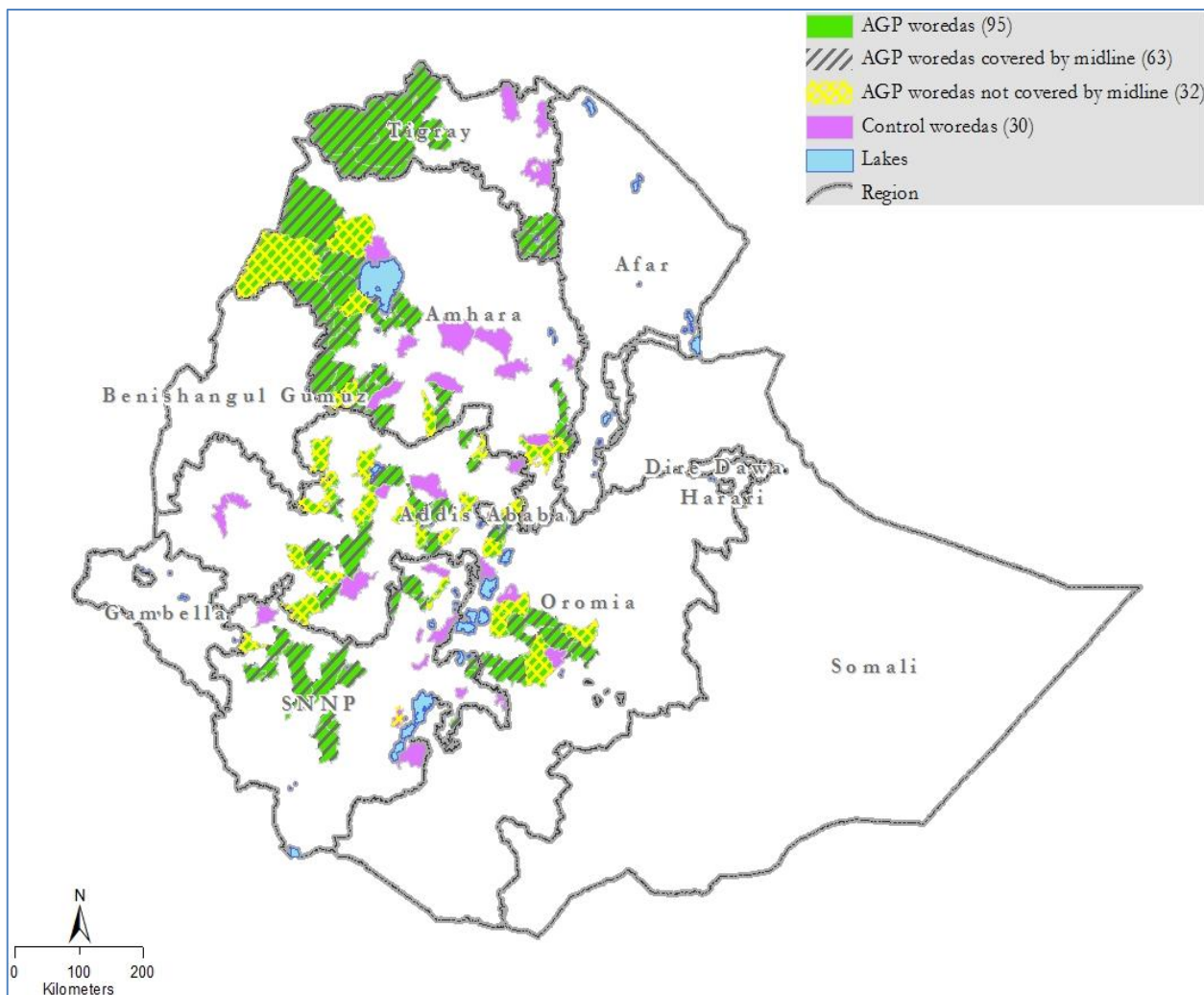
3. DATA AND SAMPLING

Our empirical estimation is based on analysis of data from 7,500 farm households collected in the second round (2013) survey of the Agricultural Growth Program (AGP) households by the International Food Policy Research Institute (IFPRI) and the Central Statistical Agency (CSA) of the government of Ethiopia. Increased smallholder productivity and value-addition in the agricultural sector are core elements of the Ethiopian government's approach to reduce poverty. The AGP is a component of this broad effort. Launched in 2011, the AGP is a five-year program with a primary objective "to increase agricultural productivity and market access for key crop and livestock products in targeted woredas, with increased participation of women and youth". The AGP focuses on agricultural growth for 93 targeted woredas in Amhara, Oromiya, SNNP, and Tigray regions. The program identifies key commodities based on consideration of current share in production, potential marketability, possibilities for spatial spill-over effects, and greater participation of women and young people. Figure 3.1 maps the distribution of the woredas covered by the AGP survey.

The sample of farm households was chosen to represent farm households in the country's areas of high agricultural productivity. The AGP is aimed primarily at increasing agricultural productivity in a sustainable manner, enhancing market

performance, and facilitating value addition in the areas targeted by the program. The sample is divided into two-thirds treated (AGP) woredas and one-third control (non-AGP) woredas. A total of 78 households per woreda were selected in the sampling. Woredas covered by the Productive Safety Net Program (PSNP) were excluded from the sample for the AGP survey.

Figure 3.1. Woredas selected for the 2013 AGP farm household survey



Source: AGP survey data

The selection of households for the baseline AGP involved three steps. First, the 61 AGP woredas for the survey were randomly selected from among the 83 woredas in which the AGP is being implemented. Similarly, 32 woredas were randomly selected from among non-PSNP and non-AGP woredas in the four regions within which AGP operates, Amhara, Oromiya, SNNP, and Tigray. Second, three EAs were randomly chosen from among all EAs in each selected woreda. Tigray is the exception to this rule because only five EAs each from ten woredas and six EAs each from two woredas were selected. The final step was to select 26 households from within each selected EA. This was done based on a list of households residing within each EA, and then selecting households randomly until the desired number of survey sample households was obtained.

The household surveys employed similar survey instruments to that of earlier AGP baseline and midline surveys, covering many aspects of household livelihoods, which among others, included information about access to production inputs and markets, availability of physical infrastructure, agricultural production and productivity, and revenues generated from marketed outputs. A complementary community-wide survey to support the household level data was also conducted in each EA in order to collect information on community assets, infrastructure, access to markets, and price information.

4. THEORETICAL MODEL AND EMPIRICAL METHODS

To inform the conceptualization and empirical investigation of assessing the drivers of tenure insecurity and demand for further formalization of land rights, a series of group mean comparison tests were conducted using the alternative indicators of perceived tenure insecurity (both at household and parcel level) adopted in this paper. These descriptive analyses are presented in Section 5 below.

4.1 Theoretical Framework:

Thereafter, a tentative demand equation for demand for formalization of land use rights in Ethiopia is developed. This is described here. The signs in parenthesis of each variable indicate the relationship between the dependent variable and the coefficient in question.

$$\text{HHD}_h = \beta_0 + \beta_1 A_h + \beta_2 MA_h + \beta_3 RP_h + \beta_4 LL_h + \beta_5 TI_h + \beta_6 Ch + \beta_8 LI_h + \beta_9 NW_h + \beta_{10} FH_h + \beta_{11} RQ_h + \beta_{12} CY_h + \beta_{13} NC_h + \beta_{14} YEAR_h + \beta_{15} RQ_h * CY_h + \beta_{16} RQ_h * NC_h + \beta_{17} AGE_h + \beta_{18} HHS_h + \beta_{19} AV_h + \epsilon_h$$

The bullet points below give an indication of what observable variables could be used as a proxy for the variables above. Namely,

- HHD_h – demand for more detailed plot information and mapping, or demand for having the names of both the husband and the spouse on the land certificate
- A – farm size - hectares per household member (+)
- MA – dummy for access to daily/periodic market (+)
- RP – rental market activity (sharecropped out) (+)
- LL – dummy for household having lost land (+)
- TI – index of tenure insecurity (such as government expropriation, boarder dispute, private dispute) (+)
- Ch – dummy for whether households have been exposed to conflicts (+)
- LI – dummy for whether money was spent on demarcation investment (+)
- NW – number of witnesses available to confirm land demarcation (-)
- FH – dummy for a female headed household (+)
- RQ – dummy for respondent perceives their land to be well demarcated. (-)
- CY – dummy for whether the household has a certificate (-)
- NC – dummy for having a certificate in the name of the household head (-)
- $YEAR$ – number of years since parcel was acquired (-)
- AGE – age in years of household head (-)
- HHS – household size (+)
- AV – value of assets as proxy for income level (+)

4.2 Empirical Methods

We employ two econometric models in order to answer our research questions. The study uses a logistic model to analyze both factors that determine the household level of tenure insecurity and demand for further land demarcation.

Plot level regressions are made to clearly visualize those factors that contribute to the risk of tenure security of farmers. A dummy dependent variable on perception of tenure insecurity is used, based on perceived risk of private land disputes, land expropriation, and or border disputes. The regression controls for a number of household and community level variables that may explain tenure insecurity for smallholder farmers. These are household characteristics (sex, household size, and value of assets as a proxy for income level), land variables (per capita farm size, value, and characteristics), land investments, and land acquisition (household land status and year that the last parcel was acquired). Community (kebele) level variables used in the regressions include population density, kebele level proportion of households who acquired their first parcel within the past 15 years, and average travel time to the nearest all weather road.

In order to analyze those factors that determine the demand for further land demarcation at household level, we use a dummy dependent variable for households who reported desiring to have further land demarcation. The predicted value of

the dependent variable can be interpreted as the probability of the demand for land demarcation, given the values of the independent variables. The estimation is done by clustering at enumeration area to obtain robust, sample-design corrected standard errors for the predicted variables.

5. DESCRIPTIVE ANALYSIS

The descriptive evidence demonstrates the importance of tenure security, how tenure insecurity relates to household and parcel level information, and how change in these arrangement could have an important impact on further land demarcation for farmers. In order to assess the tenure insecurity of farm households, we used three main indicators. These are perceived risk of private land dispute, perceived risk of land expropriation, and the likelihood of a border dispute.

There are four types of tenure arrangement in this dataset – community allocated, inherited, purchased, and mortgaged – each with different bundles of rights governing access, use, and transfer (Table 5.1). The majority of farm households obtain land through administrative based allocation from the community (Peasant Association) administration, and it is the dominant tenure arrangement. Community allocated land is not transferable except to family members through bequeathing. While community allocated land provides basic rights, there are emerging derivative tenure systems, such as access to land through informal land rental markets. For the purpose of this analysis, we consider only those parcels owned by households – that is, parcels accessed through rental market were not included in the analysis.

Table 5.1: Mode of acquisition and purpose of land use by region

Variables	Tigray	Amhara	Oromiya	SNNP
Mode of land acquisition, % of plots				
Community allocated	79.0	60.2	51.1	13.1
Purchased	1.9	1.6	2.6	8.4
Inherited/Parental gift	19.0	38.1	46.1	78.5
Mortgaged	0.1	0.1	0.1	0.0
Total plots	4,757	6,803	5,781	3,508
Purpose of land use, % of plots				
Owner operated	52.5	71.3	71.0	64.9
Rented out	1.9	1.5	1.5	0.4
Sharecropped out	5.7	10.1	4.7	1.0
Permanent	4.4	7.0	13.8	58.1
Fallowed	1.4	0.9	2.4	6.1
Average parcel size, ha	0.40	0.34	0.50	0.45
Households with plots with natural boundaries, %	62	58	46	21
Households with plots with clear boundary demarcation, %	82	89	92	94

Source: Author calculation from AGP dataset

Our parcel level analysis revealed that over 79 percent of parcels in Tigray are obtained through government allocation while only 19 percent are obtained through inheritance and parental gift. In striking contrast to Tigray, nearly 79 percent of the parcels in SNNP are obtained through inheritance and parental gift, while only 13 percent are obtained through government allocation and 8.4 percent through purchases. In Amhara, over 60 percent of the parcels are obtained through government allocation, while 38 percent are obtained through inheritance and parental gift. Similar to the pattern seen in Amhara, over 51 percent of the parcels in Oromiya are obtained through government allocation, while 46 percent are obtained through inheritance and parental gift (Table 5.1).

The analysis also revealed that the majority of the farm population has access to land, regardless of whether they were in a position to be able to cultivate it. Nearly half of households in the four regions use the land for their own cultivation of annual crops. The proportion of parcels with clear boundary demarcations is very high for all regions (Table 5.1).

5.1 Household and parcel level analysis of correlates of perceived land tenure insecurity

Table 5.2 presents the means comparison test of tenure insecurity indicators on household characteristics. Perceived risk of land dispute and the risk for government expropriation is positively associated with having a single, never married status, and it is found to be statistically significant. However, when we analyzed the data at the parcel level, the analysis did not reveal the existing statistically significant association between perceived risk of land dispute and being of single, never married status (Table 5.2). On the other hand, the demand for further land demarcation is positively associated with non-farm employment. Those who are engaged in non-farm businesses are the ones who demand better protection of land rights – and exhibit a greater preference for participating in the second-level land certification process.

Table 5.2: Means comparison: Household characteristics versus tenure insecurity indicators

Variables	Perceived risk of land dispute		Perceived risk of expropriation		Demand for land demarcation	
	Yes	No	Yes	No	Yes	No
Single, never married, 0/1	0.036	0.024**	0.030	0.026**	0.028	0.027
Widow, 0/1	0.163	0.179	0.176	0.156	0.166	0.191
Divorce, 0/1	0.052	0.033	0.040	0.039	0.041	0.026
Farming, 0/1	0.878	0.865	0.870	0.859	0.867	0.883
Domestic work, 0/1	0.076	0.093	0.082	0.108	0.089	0.080
Non-farm, 0/1	0.032	0.022	0.031	0.021	0.030	0.017***
Other, 0/1	0.014	0.020	0.018	0.012	0.015	0.020
<i>Number of observations</i>	<i>2,566</i>	<i>3,725</i>	<i>5,864</i>	<i>1508</i>	<i>3,195</i>	<i>1,753</i>

Source: Author calculation from AGP dataset

Table 5.3 indicates the association between the mode of land acquisition and the tenure insecurity variables. The perceived risk of land disputes is positively associated with having the first-level land certification. Border disputes, being the most likely dispute reported by the farmers, is positively associated with land acquisition through government allocation, while it is negatively associated with land acquisition through inheritance. There exist a negative relationship between relative land abundance and tenure security of households. The likelihood of border disputes is positively associated with the number of parcels and farm size of the households – households with relatively larger landholdings or number of parcels are the ones who perceive that they face higher risks of boundary related disputes.

Table 5.3: Means comparison: mode/years of acquisition versus tenure insecurity

Variables	Perceived risk of land dispute		Most likely dispute is over borders		Perceived risk of expropriation		Demand for land demarcation	
	Yes	No	Yes	No	Yes	No	Yes	No
Has certificate, 0/1	0.84	0.82*	0.85	0.79	0.82	0.80	1.00	1.00
Acquisition allocated, 0/1	0.40	0.39	0.43	0.37***	0.40	0.39	0.40	0.44
Acquisition inherit, 0/1	0.56	0.58	0.54	0.60***	0.57	0.58	0.56	0.55
Acquisition purchase, 0/1	0.04	0.03	0.03	0.04	0.04	0.03	0.05	0.02*
Maximum years since acquired	21.8	22.0	21.7	22.3	21.9	22.4	22.0	23.8*
Parcel distance, minutes travel time	13.0	12.4	12.0	12.6	12.1	13.0	12.1	12.7
Parcel number	3.09	2.96	3.13	2.79**	3.00	2.79	3.03	3.13
Farm size, ha	1.25	1.27	1.34	1.23**	1.26	1.36	1.35	1.38
<i>Number of observations</i>	<i>2,566</i>	<i>3,725</i>	<i>3,766</i>	<i>3,608</i>	<i>7,492</i>	<i>7,492</i>	<i>3,195</i>	<i>1,753</i>

Source: Author calculation from AGP dataset

Demand for further land demarcation is positively associated with land acquisition through purchases. Moreover, consistent with the rationale for rolling out the second-level land certification, demand for second-level land certification is negatively associated with the length of time the household takes to acquire its first farm (Table 5.3). This could be due to lack of updates in the land registry system where parcels recently inherited or acquired could be the ones that are left without proper documentation to protect the interest of new landholders, and thus afford higher demand for new demarcation through the second-level certification.

Tables 5.4, 5.5, and 5.6 present the parcel level descriptive analysis and compares parcels with different likelihoods of private disputes of ownership or use right (i.e. insecure parcels) and parcels with no likelihood of private dispute (i.e. secure parcels).

As Table 5.4 shows, among the insecure parcels, the proportion of these that are registered, i.e., they have a certificate, is 65.5 percent. This is less than the comparable figure of 69.3 percent obtained from secure parcels. On the other hand, demand for second-level land certification (demarcation) is positively associated with tenure insecurity. Among the insecure parcels, the proportion of parcels for which households require land demarcation is 67.3 percent, while the comparable figure among tenure secure parcels is only 61.2 percent. Among the insecure parcels, the proportion of parcels that are acquired through government allocation is 55.1 percent. This is slightly higher than the comparable figure obtained for secure parcels of 54.1 percent. In contrast, among the insecure parcels, the proportion of parcels that are acquired through inheritance and parental gift is 42.0 percent, slightly less than the comparable figure obtained for secure parcels of 42.8 percent. In terms of farm size, the average size of parcels that are insecure (0.47 hectare) is slightly larger than that of secure parcels (0.45 hectare).

Table 5.4: Means comparison: parcel characteristics versus tenure insecurity indicator

Parcel Characteristics	Perceived risk of land dispute				Significance
	No		Yes		
	Obs.	mean	Obs.	mean	
Years since the parcel acquired	11,500	20.0	9,327	20.3	
Distance of the parcel from owner's home, minutes travel time	11,500	18.7	9,326	19.5	
Parcel is registered, %	11,500	69.3	9,327	65.5	***
Farm size owned, ha	11,500	0.44	9,322	0.47	***
Acquired through allocation, %	11,488	53.2	9,313	55.1	***
Acquired through inheritance/parental gift, %	11,488	43.5	9,313	42.0	**
Acquired through purchase, %	11,488	3.2	9,313	2.9	
Demand for 2 nd level land certification, %	8,020	61.2	6,130	67.3	***

Source: Author calculation from AGP dataset

Table 5.5 compares secure and insecure parcels by the parcel owners' marital status and occupation. We found that 70.3 percent of the insecure parcels and 71.4 percent of the secure parcels are owned by households where the head is monogamous, while 4.8 percent of the insecure parcels and 4.3 percent of the secure parcels are owned by households where the head is polygamous. Among the total parcel owners, 16.2 percent are widowed, 6.0 percent are divorced and 2.4 percent are single; and, in this regard, no statistically significant difference is observed between secure and insecure parcels. With regard to occupation, we found that 88.3 percent of the insecure parcels and 87.5 percent of the secure parcels are owned by households where the head is primarily a farmer, while 8.2 percent of the insecure parcels and 7.8 percent of the secure parcels, are owned by households where the head is primarily a domestic worker.

Table 5.5: Mean comparison: Household characteristics versus tenure insecurity indicator, percent

Demographic variables	Perceived risk of land dispute				Significance
	No		Yes		
	Obs.	mean	Obs.	mean	
Head is monogamous	11,492	71.4	9,313	70.3	*
Head is polygamous	11,492	4.3	9,313	4.8	*
Head is single	11,492	2.4	9,313	2.4	
Head is widowed	11,492	16.2	9,313	16.3	
Head is divorced	11,492	5.8	9,313	6.2	
Head's primary occupation is farming	11,492	87.5	9,313	88.3	*
Head's primary occupation is domestic work	11,491	8.5	9,313	7.8	**
Head's primary occupation is non-farming	11,491	2.3	9,313	2.5	

Source: Author calculation from AGP dataset

Table 5.6 compares secure and insecure parcels in reference to parcel level characteristics. Among the insecure parcels, the proportion of parcels that are left fallow is 5.9 percent, less than the comparable figure obtained from secure parcels of 7.1 percent. Similarly, among the insecure parcels, the proportion of parcels that supports permanent crops is 17.1

percent, higher than the comparable figure obtained from secure parcels of 19.7 percent. When we consider land rental, among the insecure parcels, the proportion of parcels that are rented-out is 7.2 percent, which is less than the comparable figure obtained from secure parcels of 7.9 percent. In contrast, 64.1 percent of secure parcels are owner-operated, compared to only 61.0 percent of insecure parcels.

Table 5.6: Mean comparison: Parcel characteristics versus tenure insecurity, percent

	Perceived risk of land dispute				Significance
	No		Yes		
	Obs.	mean	Obs.	mean	
Parcel has permanent crops	11,374	19.7	9,171	17.1	***
Parcel is fallow	11374	7.1	9,171	5.9	***
Parcel's slope is steep (<i>gedel</i>)	11,488	1.9	9,314	1.9	
Parcel is rented-out	11,374	7.9	9,171	7.2	**
Parcel is owner operated	11,374	61.0	9,171	64.1	***

Source: Author calculation from AGP dataset

General household characteristics of the sample are shown in Table 5.7. Average household size is about five persons and is almost similar for all regions considered. Since the sampling procedure included 30 percent female-headed households, the AGP dataset gives an opportunity to look at gender dimensions. Illiteracy is pervasive, where only 38 percent of the household heads in the sample are literate with informal schooling and primary education level. The proportion of households with no education is higher in Tigray and Amhara regions. Primary level education is higher for Oromiya and SNNP.

Table 5.7: Basic household characteristics of the sample

Household characteristics	Overall	Tigray	Amhara	Oromiya	SNNP
Household size	4.85	4.75	4.33	5.05	5.05
Male-headed households, %	69.0	68.7	69.5	69.0	70.0
Age of household head, years	45.0	45.1	45.3	44.9	43.4
Educational attainment, % of household heads					
Illiterate	62.0	66.0	72.7	56.9	58.2
Informal education	4.7	6.5	12.6	1.8	1.3
Primary	29.6	25.3	13.8	36.5	34.9
Secondary	2.9	2.1	0.8	3.6	3.9
Higher education and above	0.8	0.0	0.2	1.2	0.7

Source: Author calculation from AGP dataset

Table 5.8 presents household land certification status and the demand for further land demarcation. This table shows that about 68 percent of households have received a land certificate. The kebele level information which describes the year in which land registration was completed shows that only 15 percent of households received land certificates before the year 2000. This was because land registration only became widespread during 2011 and 2012 in most of the regions, with the exception of Tigray region, where land certification first started in 2005/06. When we consider demand for the new land demarcation, more than half of the households in the survey reported that they wanted additional delineation of the boundaries of their plots. Some of the rationale behind further land demarcation could be related to an absence of neighbors to serve as witnesses to the ownership of the land parcel. On the other hand, the border demarcation might become less clear with time due to physical erosion that could destroy the natural boundary that was used for land parcel demarcation. Questions were asked regarding the type of legal certificates that were held for each of the parcels. The survey result reveals that a large proportion of households have a land tax receipt as the legal document for their parcel, followed in second place by an approved survey plan.

Table 5.8: Household land certification status and demand for new demarcation, percent

Land certification characteristics	Percent
Households who have land certificates	68
Land certificate from before 2000	15
Land certificate from after 2000	85
Demand for new land demarcation	64
Type of land certificate	
Land tax receipt	58.5
Approved survey plan	12.4
Family receipt	10.0
Green book	9.8
Registered purchase agreement	2.9
Will agreement	1.2
Unregistered purchase agreement	0.6
Building plan	0.1
Other	4.3

Source: Author calculation from AGP dataset

Table 5.9 presents the tenure security variables for each region. The perceived risk of land dispute is computed from farmers' perceptions about the likelihood of dispute on land ownership or land use right. The answers are summarized into six categories. Farmers were asked to rank the likelihood of dispute as very high, high, moderate, low, very low, or not at all. From this ranking, a dummy variable was constructed where a value of 1 was given to those respondents who indicated some level of likelihood of dispute and a value of 0 was assigned to those who indicated there was no likelihood of dispute. Moreover, perceived risk of land expropriation by the government in the five years following were constructed in the same manner. Generally, parcels with perceived risk of private land dispute is high at 45 percent, while parcels with perceived risk of government expropriation is low at 16 percent. However, the latter is relatively higher in Oromiya and SNNP regions and low in Amhara

Table 5.9: Household land tenure security variables, percent

Tenure insecurity variables	Overall	Tigray	Amhara	Oromiya	SNNP
Perceived risk of private land dispute	45	48	47	44	38
Perceived risk of land expropriation	16	18	11	20	20
Likelihood of border dispute	59	61	64	57	48

Source: Authors' calculation from AGP dataset

Data on total farm size and parcel numbers owned by the household shows that the average household's landholding is about 1.3 hectare, with the smallest average landholding in SNNP. Half of the households in the study overall had landholdings which were less than one hectare. More than half of the households in Oromiya had landholdings of more than one hectare. In terms of number of land parcels, the majority of households had on average three parcels with regional variation (Table 5.10). However, the average area of land operated per household member is quite small.

Table 5.10: Parcel number and size by region

Variables	Overall	Tigray	Amhara	Oromiya	SNNP
Number of parcels, median	3	3	4	3	2
Farm size, ha	1.3	1.3	1.3	1.6	0.8
Households with overall farm size, %					
Less than or equal to 1.0 ha	55.8	53.5	50.7	41.9	74.6
1.0 to 2.5 ha	32.3	32.8	38.6	38.9	20.0
More than 2.5 ha	13.0	13.6	10.7	19.1	5.3
Household size	4.8	4.7	4.3	5.0	5.0
Farm size per capita, ha/person	0.30	0.33	0.35	0.34	0.17

Source: Author calculation from AGP dataset

Farmers who rented or sharecropped out part of their area have higher risk of government expropriation. This is in line with the Ethiopian land policy where farmers cannot rent out their land for long periods of time. This stipulation is in addition to a restriction on the area of land that can be sharecropped out (Table 5.11). The risk of government expropriation is less where an area is planted with a permanent crop. This could imply that permanent crops serve as a way of demarcating the land, as they remain for long periods of time once planted.

Table 5.11: Means comparison at household level: Parcel characteristics by tenure insecurity

Variables	Perceived risk of land dispute		Perceived risk of expropriation		Most-likely dispute is over borders	
	Yes	No	Yes	No	Yes	No
Steep (<i>gedel</i>) area as proportion of parcel	0.01	0.02	0.02	0.01*	0.01	0.02**
Rented out area proportion	0.01	0.01	0.01	0.01*	0.01	0.01
Sharecropped out area proportion	0.07	0.06	0.07	0.04**	0.07	0.05**
Fallow area proportion	0.02	0.02	0.02	0.02	0.02	0.02**
Permanent perennial crop area proportion	0.15	0.19	0.17	0.12**	0.12	0.20**
Operated area proportion	0.82	0.69	0.77	0.74	0.78	0.74
<i>Observations</i>	2,566	3,725	5,864	1,508	3,766	3,608

Source: Author calculation from AGP dataset

5.2 Role of population pressure and relative land scarcity on tenure insecurity

Regardless of the tenure insecurity indicator that we used, population density appears to have a negative correlation with tenure insecurity. Our analysis indicates that households living in relatively less populated kebeles (communities) perceive both greater public tenure security risk (proxied by risk of expropriation) and greater private tenure security risk (proxied by risks of border and ownership disputes). As can be seen in the top half of Table 5.12, the average population density of the kebeles where households perceive public and private tenure security risks is lower than the average population density of the kebeles in which respondents reported few such tenure security risks.

Table 5.12: Means comparisons of household perceived tenure insecurity and the role of kebele-level social and economic factors

Kebele-level variables	Expropriation risk is most important risk			Border dispute is most important risk			Ownership dispute is most important risk			Border or ownership dispute is most important risk		
	No	Yes	Significance	No	Yes	Significance	No	Yes	Significance	No	Yes	Significance
Population density, persons per sq. km	187.9	162.8	***	188.7	180.7	*	185.2	159.5	***	185.6	182.1	
Fallowed land, proportion	0.21	0.23	**	0.23	0.21	***	0.22	0.21		0.23	0.21	***
Average farm size per capita, ha/person	0.32	0.33	*	0.31	0.32	*	0.32	0.34	***	0.31	0.32	*
First parcel acquired in past 15 years, 0/1	0.36	0.38	***	0.35	0.37	***	0.36	0.37		0.36	0.37	**
Corrugated iron roof, %	35.1	33.6	**	33.4	35.4	***	34.8	34.8		33.9	35.2	**
Average travel time to the nearest city (> 50, 000 pop), minutes	210	208		208	210		207	234	***	207	210	
Average travel time to the nearest all weather road, minutes	124	120		122	123		121	150	***	122	123	

Source: Authors' calculation from AGP dataset

This finding does not seem in line with the conventional hypothesis that 'higher population density is associated with higher level of tenure insecurity' (Andre and Platteau 1998; Deininger and Castagnini 2006). However, this pattern may result from past policy interventions to solve tenure insecurity, e.g., maintenance of the land registration system, having focused mainly on densely populated areas.

Generally, we find a negative correlation between other relative land scarcity indicators, such as average farm size per-capita and land fallowing practice, and tenure insecurity. However, unlike population density, it is not possible to establish a conclusive association between them.

We found average farm size per capita to be consistently positively correlated with tenure insecurity, regardless of the category of risk, whether public tenure security risk or private tenure security risk, or the type of private tenure security risk considered, i.e., border dispute risk versus ownership dispute risk. As shown in Table 5.12, the average farm size per capita of the kebeles where households who perceived public and private tenure security risks reside is higher than that of other kebeles. This can be again due to the focus of past policy interventions in the densely populated areas.

Depending on the category of tenure security risk, i.e., whether public tenure security risk or private tenure security risk, we used, we found mixed results when measuring the correlation between following practice (the other proxy variable we used to measure relative land scarcity) and tenure insecurity. On the one hand, our analysis suggests that following practices are positively correlated with public tenure security risk, as proxied by expropriation risk. On the other hand, our analysis suggests that following practice is negatively correlated with private tenure security risk, regardless of the type of private tenure security risk considered, i.e., whether border dispute risk or ownership dispute risk. From Table 5.12, the proportion of following-practicing households in the kebeles where households who perceive private tenure security risk reside is shown to be lower than it is in the other kebeles. This suggests that it is government expropriation risk that is more of a threat to households who practice land following in Ethiopia than private tenure security risks.

5.3 Role of land use change and urbanization on tenure insecurity

Regardless of the tenure insecurity indicator we used, land use change appears to be positively correlated with tenure insecurity. Our analysis indicates that households living in kebeles with higher proportions of new land holders perceive both public tenure security risk and private tenure security risk. As can be seen in bottom half of Table 5.12, the proportion of households that acquired their first piece of land within the past 15 years is higher in the kebeles where households perceive public and private tenure security risks. This finding is consistent with our expectation that the 1995 decree to halt administrative land redistribution in Ethiopia has played a positive role in enhancing tenure security. Households that reside in villages with recent land redistribution programs have a higher perception of tenure insecurity, regardless of which alternative indicator of tenure insecurity is used.

Depending on the category of tenure security risk, i.e., whether public tenure security risk or private tenure security risk, and type of private security risk, i.e., whether border dispute risk or ownership dispute risk, we used, we found mixed result when we measure the correlation between urbanization – being proxied by average number of houses with corrugated roofs per kebele, average travel-time from the kebele to the nearest big city, and average travel-time from the kebele to the nearest all-weather road – and tenure insecurity.

On the one hand, urbanization, as proxied by average number of houses with corrugated roofs per kebele, appears to be negatively associated with public tenure security risk, as proxied by expropriation risk. On the other hand, urbanization, as proxied by the average number of houses with corrugated roofs per kebele, appears to be positively associated with private tenure security risk, as proxied by risk of border dispute. This finding is consistent with our assertion that there is a good chance to see higher tenure insecurity associated with expropriation risks in remote rural areas, perhaps due to the restricted use and transfer rights farmers have in such areas, while boundary related tenure risks are more common in urban or peri-urban locations. This is an important finding, as policy actions to address each source of tenure insecurity may need to be tailored depending on their significance in dictating households' perceived tenure insecurity. Land demarcation interventions are needed in areas where there is perception of significant boundary associated tenure risks, whereas regulatory and legislative reforms could be best suited to address the situation in areas where farming households perceive significant expropriation related tenure risks.

6. MODELING RESULTS AND DISCUSSION

Table 6.1 presents the household-level logistic regression outcomes on the probability of demand for second-level land certification. Descriptive results presented in Appendix 6.1 and Appendix 6.2 vindicated our approach to household-level demand analysis, as most of the parcel-level analyses on perceived tenure insecurity indicate that there is little parcel-specific variations to responses captured at parcel-level. When we calculated the percentage of interviewed households that gave the same responses (either as entirely “Yes” or entirely “No”) to questions which captured tenure insecurity at parcel level – such as experience of past land related disputes; level of private land dispute risk; level of government land expropriation risk; level of confidence about compensation in case of expropriation; clarity of parcel boundary mark; and mode of parcel acquisition – the proportion of households with the same responses for all their parcels range from 81 to 98 percent. Hence, our household-level analysis to determine factors associated with demand for second-level land certification is justifiable. The

first two columns (Model-1 and Model-2) in Table 6.1 show the results of the logit model without the regional clusters included, while model-3 presents the results obtained after controlling for regional clusters, using Oromia region as a baseline. Empirical results remain robust across the three alternative models.

Table 6.1: Factors associated with household level demand for second-level land certification – logistic model

Explanatory Variables	Model - 1 Mfx/(se)	Model - 2 Mfx/(se)	Model - 3 Mfx/(se)
Perceived risk of government expropriation, 0/1	-0.011 (0.03)	-0.014 (0.04)	0.002 (0.04)
Perceived risk of private dispute, 0/1	0.047* (0.03)	0.052* (0.03)	0.062** (0.03)
Made expenditures on a new house, 0/1	0.077*** (0.02)	0.082*** (0.03)	0.076*** (0.03)
Land area rented out, proportion	0.000 (0.04)	-0.047 (0.06)	-0.107* (0.06)
Interaction term (Rented out * Gender)	-0.131** (0.07)	-0.119 (0.09)	-0.064 (0.09)
Land area with natural boundary, proportion		-0.001 (0.01)	-0.001 (0.01)
Parcels with fertile soil, number		0.005 (0.01)	0.002 (0.01)
Current head is holder of the certificate, 0/1		0.022 (0.03)	0.048* (0.03)
Years with certificate		-0.005 (0.01)	-0.005 (0.01)
Border dispute experience, 0/1		0.069*** (0.02)	0.066*** (0.02)
Clear border demarcation before registration, 0/1		0.123*** (0.04)	0.138*** (0.04)
Protect against encroachment, 0/1		0.153*** (0.03)	0.150*** (0.03)
Marital status (1=single)		0.005 (0.03)	(0.01) (0.03)
Age of household head (years)		0.000 (0.000)	-0.001 (0.000)
Male household head, 0/1		0.001 (0.02)	(0.02) (0.02)
Household size		0.000 (0.01)	0.004 (0.01)
Farm size per capita, ha/person		0.014 (0.03)	0.04 (0.03)
Land predominantly acquired via inheritance, 0/1		-0.043* (0.02)	-0.041* (0.02)
Years since first parcel acquisition		-0.002** (0.001)	-0.002** (0.001)
Distance to market (km)		0.001 (0.001)	0.001** (0.000)
Tigray region			0.113* (0.06)
Amhara region			0.041 (0.05)
SNNP region			-0.124*** (0.05)
Number of observations	3,936	3,377	3,377
Probability > Chi ²	0.0023	0.0000	0.0000
Pseudo R ²	0.0055	0.0918	0.1563
Log likelihood	-3190.47	-1899.67	-1667.99

Source: Authors calculation from AGP data.

Note: Figures in parentheses are standard errors. Significance levels: * 10% level, ** 5% level, *** 1% level, **** 0.1% level.

Consistent with the results from the descriptive analysis from Section 5, the results shown in Table 6.1 reveal that households that experienced border disputes before the first-level land registration was implemented are more likely to be interested in a second-level certificate. This indicates the impact that greater tenure insecurity due to past conflict experience has on demand for certificates with clear boundary demarcations. Our empirical findings show significant perceived tenure insecurity on household demand for more protection of land rights. Moreover, households with higher perceived risk of private land disputes are more likely to be interested in the second-level land certificates.

We find that respondents are more likely to be interested and to have better awareness of the benefits of second-level certification based on their expectation that this will provide better protection against encroachment. This is perhaps because the first-level land certification used general boundaries to identify parcels which are not suitable for resolving potential disputes related to encroachment of boundaries, since no parcel demarcation was done.

None of the household demographic variables, such as, age, marital status, gender of the household head, etc., were found to be significantly associated with demand for second-level land certification. However, other household level variables, such as modes of land acquisition, incidences of investment in building, and the time since acquiring the first parcel, are strongly associated with explaining demand for the second-level land certification.

Consistent with results from our descriptive analysis, the regression results reveal that the length of time since a household acquired its first parcel is negatively associated with an interest in obtaining a second-level certificate. This could be because these households are likely to feel more secure with respect to their land tenure, compared to new landholders (recent settlers) who could be victims of a neglected land registry system which characterizes the land registration process in Ethiopia (Deininger et al. 2008). As far as the latter group is concerned, the demand for more protection of land rights through second-level land certificates could be even higher since these groups are more likely to benefit from recent land redistribution or inheritance, and thereby have more insecurity on their tenure rights over their parcels. Moreover, interest in second-level land certification is significantly lower among households that predominantly acquired their parcels through family inheritance, compared to those who acquired their parcels predominantly from government allocation or purchases². This could be due to frequent administrative redistribution of government allocated land in the past, which was driven by considerations of equity in land distribution, causing such households to feel less secure about the perpetuity of their rights over their land. Thereby, they demand better protection of their rights in the form of the second-level land certification.

Another interesting variable is the effect of a household's investment in new houses or building structures. Our empirical results reveal that those who built a new house or spent money to improve their house are more likely to seek clearer demarcation of their landholdings. This could be interpreted in two ways. First the variable can be taken as a proxy for the status of the household by which the demand for further formalization of land is higher for better-off families. On the other hand, households who invest in housing construction may be more tenure insecure, and building a new house may help ensure clearer boundaries.

After controlling for other factors, households in SNNP, the latest region to implement the first level land certification, are less likely to demonstrate demand for the second-level land certification, while households from Tigray region, the first region to implement the first level land certification almost nine years before the roll out in Oromia region (our baseline region for the model), shows significantly higher demand for second-level land certification. This could be due to obsolete boundary markings from the first-level land certification in Tigray, which may be less of an issue in areas where the first-level certification process was conducted more recently, as in SNNP, or due to greater need for rights to be documented in areas where the first level certification was administered 20 years ago, i.e., Tigray.

Second-level land certification depends also on market access, which in turn is associated with proximity to urban settlements. Farmers residing in remote areas are more likely to demand proper land demarcation, though the effect is marginal. This could be due to the fact that those living far from a town are limited to a life of farming, and thus increasing their tenure security might be very important to them. On the other hand, this could be also due to being near to town, which may be dominated by informal settlers in slum areas. The landholding household may feel that in the process of further demarcation by the government, this might result in having their land confiscated by the state and, hence, their demand for further land certification decreases.

The next regression outcomes (Table 6.2) illustrate what factors determine the tenure insecurity of farm households. Our plot-level regression analysis suggests that both public land tenure security risk, proxied by government expropriation

² Land predominantly acquired via inheritance is equal to 1 if more than 50% of the parcels in the household are acquired via inheritance and 0 otherwise.

risk, and private land tenure security risk, proxied by border dispute risk, are positively associated with household-level relative land abundance, calculated as the ratio of farm size per capita to kebele average farm size per capita. This finding does not seem to be in line with the conventional hypothesis that says 'land scarcity is positively associated with level of tenure insecurity' (Andre and Platteau 1998; Deininger and Castagnini 2006). However, this also could be related to the fact that past policy interventions that attempted to solve tenure insecurity in Ethiopia mainly focused on land-scarce areas, and could possibly neglect parts of the country where land is abundant.

It seems that land certification tends to aggravate border dispute risk, even as it achieves its objective of curbing the risk of expropriation. In this regard, the regression results suggest that households perceive a higher level of border dispute risk for plots with certificates than plots without certificates. In connection to this, it is also observed that the lack of man-made boundary demarcations seems to be positively associated with border dispute risk, as households are more fearful of border disputes for plots that have only natural boundary demarcations.

Table 6.2: Regression results on plot level drivers of tenure insecurity using several indicators of tenure insecurity

Explanatory Variables	Private risk Mfx (A)	Expropria- tion risk Mfx (B)	Border dispute Mfx (C)	Index (B+C+ past dispute experience) Mfx
Household-level relative land abundance, 0/1 *	-0.001*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.000 (0.000)
Interaction of farm size * Male household head	-0.020* (-0.01)	0.017* (-0.01)	-0.005 (-0.01)	0.001 (-0.01)
Household rented out or sharecropped out, 0/1	0.008 (-0.02)	-0.004 (-0.01)	-0.023 (-0.02)	-0.013 (-0.02)
Interaction rented out * Male household head	-0.042 (-0.03)	-0.027 (-0.02)	-0.001 (-0.02)	0.052* (-0.03)
Community allocated land, 0/1	0.01 (-0.01)	-0.002 (-0.01)	0.009 (-0.01)	-0.01 (-0.01)
Purchased land, 0/1	0.003 (-0.02)	-0.022 (-0.01)	0.021 (-0.02)	0.014 (-0.02)
Farm size, ha	0.020** (-0.01)	-0.013 (-0.01)	0.000 (-0.01)	-0.006 (-0.01)
Fallow plots, number	-0.029** (-0.01)	-0.022** (-0.01)	-0.025** (-0.01)	0.024* (-0.01)
Annually operated plots, number	0.005 (-0.01)	0.004 (0.000)	0.006 (0.000)	-0.013*** (0.000)
Permanent plots, number	-0.013** (-0.01)	-0.005 (-0.01)	-0.004 (-0.01)	0.009 (-0.01)
Head makes decisions on land use solely, 0/1	-0.036** (-0.02)	-0.01 (-0.01)	0.043*** (-0.01)	0.042** (-0.02)
Joint decisions by household member on land use, 0/1	-0.093*** (-0.02)	-0.031** (-0.01)	0.035** (-0.01)	0.108*** (-0.02)
Natural boundary for border demarcation, 0/1	-0.005 (-0.01)	-0.002 (-0.01)	0.060*** (-0.01)	0.009 (-0.01)
Has land certificate, 0/1	-0.005 (-0.01)	-0.022*** (-0.01)	0.022** (-0.01)	0.030*** (-0.01)
Age of household head, years	-0.001*** (0.000)	0.000 (0.000)	0.000 (0.000)	0.001*** (0.000)
Male household head, 0/1	0.016 (-0.01)	-0.003 (-0.01)	0.009 (-0.01)	-0.006 (-0.01)
Years since land acquisition	0.002*** (0.000)	0.001*** (0.000)	-0.001** (0.000)	-0.002*** (0.000)
Village average land size (ha) per capita	0.003*** (0.000)	0.001 (0.000)	0.003*** (0.000)	-0.003*** (0.000)
Village level prevalence of land markets, 0/1 **	-0.253*** (-0.03)	-0.009 (-0.02)	0.243*** (-0.02)	0.216*** (-0.03)
Households which first land owned within 15 years, proportion	0.153*** (-0.03)	0.062*** (-0.02)	-0.255*** (-0.03)	-0.203*** (-0.03)

Explanatory Variables	Private risk Mfx (A)	Expropriation risk Mfx (B)	Border dispute Mfx (C)	Index (B+C+past dispute experience) Mfx
Economic vibrancy, 0/1 ⁺⁺⁺	0.075 ^{***} (-0.02)	-0.024 ^{**} (-0.01)	0.022 [*] (-0.01)	-0.048 ^{***} (-0.01)
Market access, minutes travel time to town with at least 50,000 persons	-0.001 ^{***} (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 ^{***} (0.000)
Access to all weather road, minutes travel time	0.001 ^{***} (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 ^{***} (0.000)
Population density, persons per square km	0.000 ^{***} (0.000)	-0.000 ^{***} (0.000)	-0.000 ^{***} (0.000)	0.000 (0.000)
Amhara region, 0/1	-0.051 ^{***} (-0.02)	-0.039 ^{***} (-0.01)	-0.025 [*] (-0.01)	0.056 ^{***} (-0.02)
Oromiya region, 0/1	-0.065 ^{***} (-0.02)	0.059 ^{***} (-0.01)	-0.073 ^{***} (-0.01)	-0.005 (-0.02)
SNNP region, 0/1	-0.176 ^{***} (-0.02)	0.093 ^{***} (-0.02)	0.100 ^{***} (-0.01)	0.074 ^{***} (-0.02)
Number of observations	20,324	20,326	20,327	20,327
Probability > Chi ²	0.000	0.000	0.000	0.000
Pseudo R ²	0.0192	0.0223	0.0286	0.0138
Log likelihood = -13693.5	-13693.5	-8830.4	-10556.2	-18261.1

Source: Authors calculation from AGP data.

Note: Figure in the parenthesis are standard errors. Significance levels: * 10% level, ** 5% level, *** 1% level, **** 0.1% level.

+: Household level variable with value of 1 if household per capita landholding is greater than the village (kebele) average.

++: Village level variable with value of 1 if proportion of households in village who participate in the land rental market (as landlord, tenant, or both) is greater than the aggregate sample average proportion of participants in the land rental market.

+++: Village level variable with value of 1 if proportion of households in village with modern roofing materials (i.e., concrete, iron/galvanized, etc.) is greater than the aggregate sample average proportion of households with modern roofing materials.

Households perceive a higher level of risk of expropriation than of border disputes for the plots that were acquired a long time ago. Based on the plot-level regression analysis, the length of time since the acquisition of the parcel is found to be positively associated with expropriation risk and negatively associated with border dispute risk. Regardless of the tenure insecurity indicator we used, following practices are negatively associated with tenure security risk. However, when we use an index to measure the overall level of tenure insecurity, we found a positive association between the number of plots that a household cultivated and the degree of tenure insecurity perceived. Results suggest that tenure insecurity is positively associated with soil quality and farm size. We found that households perceive higher levels of expropriation risk for *lem* (high soil quality) plots than for other plots. Similarly, our plot level regression analysis indicates that both overall farm size and farm size per capita are positively associated with private land tenure security risk.

When comparing parcels where the wife of the head is reported to be the sole decision maker on its use to parcels where such decision making is solely made by the head or collectively shared, higher risk of private-type disputes, such as over ownership, and higher perceived risks of expropriation are associated with the former case. This result is indicative of the higher vulnerability to risk of land loss or disputes of female-controlled parcels when compared to parcels controlled collectively with other household members or by heads of households, who are predominantly male. Regardless of the tenure insecurity indicator we used, the way that the land is acquired – whether the plot is purchased or allocated by local officials – does not seem to have a significant association with tenure insecurity. The plot-level regression analysis also includes kebele (equivalent to community) level variables to assess whether a household's perception of tenure security risk varies based on community level factors.

Regardless of the tenure insecurity indicator we used, and consistent with our findings based on means comparisons in the descriptive analysis section, the regression analysis suggests that population density appears to be negatively correlated with tenure insecurity. Households perceive lower levels of risk of expropriation and border dispute for plots in kebeles where the population density is greater. As indicated above, this could be because policy interventions in the past mainly focused on densely populated areas in an attempt to solve tenure insecurity in such areas.

Consistent with our findings from the descriptive analysis in Section 5, the regression analysis suggests that land use change through administrative land redistribution is positively correlated with public tenure insecurity. Households reported greater fear of land expropriation on parcels located in kebeles where there is a higher proportion of new landholders.

This result suggests that the land decree of 1975 (“land to the tiller”) continues to influence households with respect to their perceived risk of land expropriation. However, the contrary holds true for boundary-related disputes. This is consistent with the government-claimed rationale for rolling out the second-level land certification, i.e., the need for further demarcation due to increasing losses in the general boundary markings of a majority of parcels, especially in areas where land was re-distributed or re-allocated a long time ago.

Consistent with the earlier descriptive results, the regression analyses suggest that the degree of economic vibrancy in an area (urbanization) is positively correlated with private tenure security risk, yet it is negatively correlated with expropriation risk. Moreover, households have a higher fear of border disputes for plots in kebeles where there is higher level of economic vibrancy, while the opposite is true for tenure risks associated with fear of government expropriation of land. Generally, as compared to Tigray, Oromiya and SNNP have higher levels of expropriation risk, while Amhara region has lower levels of expropriation risk. This could possibly be related to the fact that the extent of private large and medium scale land acquisitions are higher in Oromiya and SNNP than is the case in Amhara and Tigray. In contrast, as compared to Tigray, SNNP has higher levels of border dispute risk, while Oromiya and Amhara regions have lower levels of dispute risk.

7. CONCLUSION

This study assessed the demand for further formalization of land rights in Ethiopia using household and parcel-level data from the four major agricultural regions of the country. Overall, there is significant variation among regions in terms of the predominant mode of land acquisition. For instance, 63.2 percent of the households in Tigray stated that they obtained all of their parcels through government allocation, while 74.3 percent of the households in SNNP obtained all of their parcels through inheritance and parental gift. On the other hand, nearly 45 percent of the households in Amhara obtained their parcels through government allocation, while nearly 42 percent of the households in Oromiya obtained all of their parcels through inheritance and parental gift. This is consistent with the findings from the parcel-level data analysis. This suggests that land policy interventions, including the introduction of second-level land certification, should be context specific by taking into account regional differences in customs and norms of land transfers and administration.

Regardless of the tenure insecurity indicator we used, and based on the kebele-level descriptive analysis, population density appears to be negatively correlated with tenure insecurity. Similarly, in line with our findings on the relation between population density and tenure insecurity, our kebele-level descriptive analysis reveals a negative correlation between the other relative land scarcity indicators, i.e., average farm size per-capita and land fallowing practice, with tenure insecurity. These findings do not seem in line with the conventional hypothesis which claims ‘higher population density is associated with higher level of tenure insecurity’. However, this may not always be the case. Specially, there is a good chance of higher tenure insecurity in less densely populated parts following the effects of past policies which addressed insecurity in populated areas and neglected less densely populated parts. Findings also suggest that government expropriation risk is more of a threat to households who practice land fallowing. Moreover, descriptive findings are also consistent with our assertion that higher tenure insecurity is associated with expropriation risks in remote rural areas, while boundary-related tenure risks are more common in urban or peri-urban locations. This is important as policy actions to address each sources of tenure insecurity may need to be tailored depending on their significance in dictating households’ perceptions of tenure insecurity. For example, land demarcation interventions are required where there are boundary-associated tenure risks, whereas regulatory and legislative reforms could be best suited to address expropriation-related tenure risks.

Our plot-level regression analysis suggests that both public land tenure security risk, proxied by expropriation risk, and private land tenure security risk, proxied by border dispute risk, are positively associated with household level relative land abundance. It also suggests that land certification tends to aggravate border dispute risk, while it seems to achieve its objective of curbing risk of expropriation. In connection to this, it is also observed that a lack of man-made boundary demarcations seems to be positively associated with border dispute risk as households fear border disputes for plots that have only natural boundary demarcations. In contrast to the results obtained in the descriptive analysis, the regression result indicates that households perceive higher levels of expropriation risk for plots that were acquired a long time ago, though they perceive less border dispute risk for such plots. The regression results also suggest that tenure insecurity is positively associated with soil quality and farm size. When we look at decision making over parcel use and explaining who has control over how the land is used, sole decision making by the head or collective decision making by members of the household is negatively associated with both risk of private-type disputes over ownership and public-type disputes, including risks of expropriation by the government. This indicates the high vulnerability of female, spouse-controlled parcels to risks of both private-type and public-type disputes.

Regardless of the tenure insecurity indicator we used, consistent with our findings based on means comparisons in the descriptive analysis section, the regression analysis suggests that kebele-level population density appears to have a negative correlation with tenure insecurity. Similarly, the same regression analysis suggests land use change to be positively correlated with expropriation risk and negatively correlated with border dispute risk.

Generally, compared to Tigray, Oromiya and SNNP have a higher level of expropriation risk, while Amhara region has a lower level of expropriation risk. This could possibly be related to private large and medium scale land acquisitions being higher in Oromiya and SNNP than in Amhara and Tigray. In contrast, as compared to Tigray, SNNP has a higher level of border dispute risk, while Oromiya and Amhara regions have a lower level of dispute risk. This could be related to the high level of land scarcity in SNNP. This suggests that, in terms of policy intervention, a cautious and pragmatic approach that takes into account observed regional variations is required.

The parcel-level descriptive analysis suggests a negative association between land registration and the likelihood of private land dispute. Furthermore, the demand for second-level land certification (demarcation) is positively associated with tenure insecurity. This shows the relevance of land certification in terms of improving tenure security. Generally, the perceived risk of government expropriation and border disputes and, consequently, the demand for land demarcation is still high in Ethiopia

Households with border dispute experience perceive a higher risk of tenure insecurity and are more likely to demand new formalization of land rights. Private land tenure security risk is positively associated with the number of parcels and farm size of the households. The results from the logistic model confirmed that demand for land demarcation is associated with the time of land acquisition. Households who acquired their land a long time ago are less tenure insecure and are less likely to demand second-level land certification.

Moreover, results from the logistic model reveal that households that experienced border dispute before the implementation of the first-level land registration, as well as households with a higher perceived risk of private land disputes, are more likely to be interested in a second-level certificate. Similarly, according to the logit model results, individuals who have greater awareness of the features of second-level land certification, such as demarcation, are more likely to be interested in this certification. Among households that predominantly acquired their parcels through family inheritance, second-level certification is significantly higher, compared to those who acquire their parcels predominantly from government allocation or purchases. Interestingly, after controlling for other factors, households in SNNP, which is the latest region to implement the first level land certification, are less likely to demonstrate demand for the second-level land certification, while households from Tigray, the first region to implement the first level land certification starting nine years ago, show significantly higher demand for the second-level land certification, compared to Oromiya.

Overall, the fact that border dispute experience is positively associated with demand for second-level land certification, suggests that the implementation of the second-level land certification needs to be implemented gradually, while giving priority to areas where land disputes are common and possibly based on need. Similarly, consideration should be paid to the fact that modes of land acquisition, incidences of investment in building structures, and the length of time since first parcel acquisition are all strongly associated with interest in obtaining a second-level certificate. Hence, the results indicate the importance of effective targeting and prioritization, using these parameters in the implementation of the second-level land certification. On the other hand, the observed variation in the demand for the second-level land registration, based on households' awareness of the added value second-level certification can bring, calls for the need for sensitization or knowledge dissemination campaigns to maximize the impacts of the new intervention. Finally, as there is regional variation in the demand for second-level land registration, the rollout strategy should not be a blanket solution for the entire nation. A cautious, pragmatic approach is what is required, taking into account the drivers of perceived tenure insecurity and economic viability of the program across the regions.

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APPENDICES

Appendix Table 1: Proportion of households who gave uniform responses to key questions for all of their parcels, by region

Key Questions	Tigray	Amhara	Oromiya	SNNP
How did your household acquire this parcel?	81.3	84.3	88.2	91.9
Have you had disputes over this parcel?	92.8	89.1	92.5	95.1
How likely will someone dispute your ownership or use right?	85.6	83.0	89.6	94.1
How confident are you that you will not lose this parcel due to government expropriation?	83.6	88.4	89.7	93.4
How confident are you that you will receive compensation for this parcel if expropriated?	88.1	89.7	91.1	94.2
What is the first most likely issue that might spur disputes?	85.3	89.2	89.7	93.9
Does this parcel have a clearly marked boundary?	93.5	95.9	96.6	98.3

Source: Author calculation from AGP dataset

Appendix Table 2: Proportion of households who acquired all of their parcels exclusively from one source, percent

	Tigray	Amhara	Oromiya	SNNP
Allocated	63.2	44.8	40.3	9.4
Purchased	7.0	5.6	6.1	8.2
Inherited/Parent's Gift	11.0	33.7	41.8	74.3
Mortgaged/Pledged	0.1	0.1	0.1	0.0
No answer	0.1	0.1	0.0	0.0
Sub-total	81.3	84.3	88.2	91.9

Source: Author calculation from AGP dataset

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