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## PERCEIVED TENURE (IN)SECURITY IN THE ERA OF RURAL TRANSFORMATION GENDER-DISAGGREGATED ANALYSIS FROM MOZAMBIQUE

By

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## **Food Security Policy *Research Papers***

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## SUMMARY

This study examines the drivers of tenure insecurity in Mozambique using data from the National Agricultural Survey (TIA) 2014 as well as a follow-up supplemental survey with detailed land tenure gender-disaggregated data from three groups: namely, principal male, principal female, and female spouses. Perceived risk of land loss (collective tenure risk) and perceived risk of a private land dispute (individual tenure risk) are used to measure land tenure insecurity. The empirical findings reveal, overall, collective tenure risks are the real threat to women's tenure security while individual tenure risks (ownership, inheritance, border disputes, etc.) are more of a threat to the tenure security of men. However, a more gender-disaggregated analysis reveals that individual tenure risk is higher among female spouses as compared to male heads within the same household. Moreover, perceived risk of land loss is higher among non-indigenous male heads while female spouses who have no control over family land are more likely to have higher perceived tenure insecurity. Results also show that land-related legal awareness seems to be more significant in dictating the (positively) perceived tenure security of women as compared to their male counterparts. Generally, tenure insecurity for female spouses seem to be associated with the emergence of land markets while relative land scarcity in a given community dictates tenure insecurity of the principal female (female heads). Hence, the empirical findings reinforce the need to complement ongoing efforts to enhance tenure security at the household and community level with gender-tailored/targeted programs that take into account the intra-household dimension of addressing issues of land tenure security.

**Keywords:** Gender, Mozambique, Perception, Rural Transformation, Tenure Insecurity

## Table of Contents

1	Introduction.....	1
2	Conceptual Framework .....	2
3	Land Tenure and Tenure Security in Mozambique .....	5
4	Data and Method.....	7
4.1	Data .....	7
4.2	Empirical Method.....	8
4.3	Robustness checks and sensitivity analysis .....	10
5	Descriptive Analysis .....	11
6	Econometric Analysis.....	13
6.1	Drivers of perceived tenure insecurity: Aggregate.....	14
6.2	Determinants of perceived tenure insecurity (fear of land loss): Gender-disaggregated.....	15
7	Conclusions .....	24
	References.....	26

## 1 Introduction

Poor agricultural productivity and food insecurity are persistent features of many less developed countries. Governments and international development agencies have therefore rightly considered agricultural intensification as the primary means for inducing technological change in developing countries that have high population pressure and low agricultural productivity. Integral to this growing global interest in agricultural intensification is the issue of land tenure security (Holden et al. 2008). Because of the conventional view that traditional or "customary" land rights impede agricultural development (Johnson 1972; Gavian and Fafchamps 1996), many developing countries and major multilateral organizations have promoted formalization of land rights (in the form of registration and documentation of land rights) as a top priority in their economic development agendas (Atwood 1990; IFAD 2001; Bonfiglioli 2003; Deininger 2003).

Against this backdrop, land tenure reform directed towards individual freehold has long been seen as a prerequisite for development in sub-Saharan Africa. However, the impact of such land tenure systems on agricultural investment and productivity in the region continues to be the subject of intense scrutiny mainly because of the mixed nature of the effects of past land titling interventions on credit access, smallholder agriculture transformation, and overall production. Recent food security crises in Africa have revived the debate over whether current land tenure systems constrain farmer innovation and investment in agriculture. Recognizing the importance of good land governance, in 2009 the African Union (AU) heads of state agreed to a framework and guidelines for land policy initiatives in Africa which have led an increasing number of countries (including Mozambique) to implement far-reaching programs to improve land tenure security.

Given the documented land-related disputes in Mozambique in recent years, several interventions are either under way or in the proposal stages in order to speed up interventions in the form of individual right protections (DUAT) and/or the community land delimitation (CLD) process to not only secure the land rights of individuals/communities but also to spur agricultural investment and overall economic transformation in the country. Theory suggests that individuals/communities respond to certification in accordance with their level of demand for such formalization of land rights. In other words, as any affirmative outcomes of such reform programs (cost effectiveness and sustainability) hinge on proper implementation and understanding of the drivers of tenure insecurity of individuals, households, and communities, differentiating between demand-driven versus supply-driven interventions may add value to assessing the respective impacts on investment, production, tenure security, etc.

This study aims to assess the drivers of tenure insecurity in Mozambique using a gender dis-aggregated supplemental survey of 3,556 farm households. This survey builds on Mozambique's agricultural survey, the National Agricultural Survey, also known as TIA (Trabalho de Inquerito Agricola), from 2014, by interviewing the same households to collect much-needed data on details of intra-household access to and control over land, land transfer (lease or inheritance) activities, household- and farm-specific indicators of perceived tenure (in)security, and knowledge of the existing land law—which are not usually well captured in various nationally representative datasets such as the TIA. Since potential policy prescriptions to address issues of tenure insecurity vary depending on the nature of the tenure security, a key contribution of this study is the disaggregated analysis of the role rural social and economic transformations play in dictating various types of perceived tenure security (private versus collective tenure risks) of individuals. Taking advantage of the unique dataset, this study also goes one step further from the conventional gender-disaggregated analysis which simply analyzes differential implications by comparing principal males with principal females. To account for potential

social and economic differences between these two groups, our gender-differentiated analysis includes comparisons of the drivers of tenure insecurity within household (intra-household analysis) by comparing principal males with female spouses. Such analysis is expected to shed some light on better understanding the inter-household and intra-household dynamics and to inform gender-tailored policy prescriptions to reduce the gender gap in enhancing tenure security.

The results show that tenure insecurity is influenced by individual, household, and community-specific characteristics and the effect of the determinants also varies across the source of tenure insecurity and gender. At the household level, the determinants of perceived tenure insecurity have contrasting and similar effects depending on whether the source of tenure insecurity is private or collective. The empirical finding from intra-household and inter-household gender-disaggregated analysis indicates that being residence in more economically vibrant communities are positively and significantly correlated with collective tenure risk of principal males while being indigenous is associated with lower likelihood of collective tenure risk for female heads. Similarly, the likelihood of collective tenure risk is significantly lower for principal females and female spouses who have at least one plot with a title and who reside in land abundant communities. Receiving legal advice on land-related matters has significant negative and positive effects on collective tenure risk for female spouses and principal males within a household, respectively. Aged principal females and female heads with larger size of farm land are more vulnerable to collective tenure risk. Whereas, being in a polygamous marriage and community-level land market vibrancy negatively and positively affects collective tenure risk for female spouses, respectively. On the other hand, the impact on collective tenure risk of participation in nonfarm activities, social connectedness, having permanent crops on a plot, demand for new land demarcation, or having no need to obtain DUAT is similar regardless of gender.

The rest of the paper is organized as follows. Section 2 presents the discussion on the conceptual framework of drivers of tenure insecurity. Section 3 describes the data and methodology employed for the econometric analysis in this study. Section 4 discusses the results obtained from the descriptive analysis. Section 5 is devoted to the discussion of the regression results for the drivers of tenure insecurity. Finally, the last section presents the conclusion and policy implications of the empirical findings.

## 2 Conceptual Framework

The economy of most African countries is dependent on agriculture and natural resources, which constitute the major share in gross domestic product (GDP), employment, and export earnings. Even if land seems to be an inexhaustible resource, ever-increasing population growth and market development are creating escalating demand and competition for land in Africa (AUC, ECA-AfDB 2011). The changes in social, economic, cultural, and political conditions are affecting customary tenure systems. Customary land tenure is the dominant land tenure system on the continent (Cotula et al. 2004).

Increased tenure security is expected to bring economic benefits to land holders mainly through three channels. First, secured land tenure will induce farmers to invest in agriculture that will increase the productivity of their land. Second, transferability of land allows transferring land from less to more productive users. Moreover, productivity increases because the resources that would have been used for securing land rights will be diverted to other productive purposes. Third, in situations where effective demand for credit exists, secured tenure, in the form of a formal title, will improve access to credit for investment (Deininger 2003). On the other hand, land is the major means of livelihood for

the poor, which serves as a vehicle for investment, wealth accumulation, and transferring wealth to descendants. Land constitutes a larger share in the asset portfolio of the poor. Thus, securing the poor's land rights is increasing the net wealth of households (Deininger and Binswanger 1999).

Despite the relative abundance of natural resources, including land, in Africa, the rate of agricultural productivity in many African countries has been among the lowest in the world (Deininger et al. 2011). The issue of land tenure security and its role in agricultural investment and productivity has been a topic of empirical research for the past five decades. A systematic literature review done by Lawry et al. (2014) indicates that the efforts made towards securing land rights in Africa show weaker results as compared to Latin American and Asian countries. Underestimating the contribution of a customary tenure system to farmers' tenure security, a lower level of household income to make investments in agriculture, and a lack of complementary public investments (investment in infrastructure, provision of inputs and market access, training for farmers) to support agricultural investment are mentioned as possible causes for the weak linkage. Fenske (2011) also examined literatures on the relationship between property rights in land and agricultural investment, performed a meta-data analysis, and concluded that the evidences are "often confusing and contradictory."

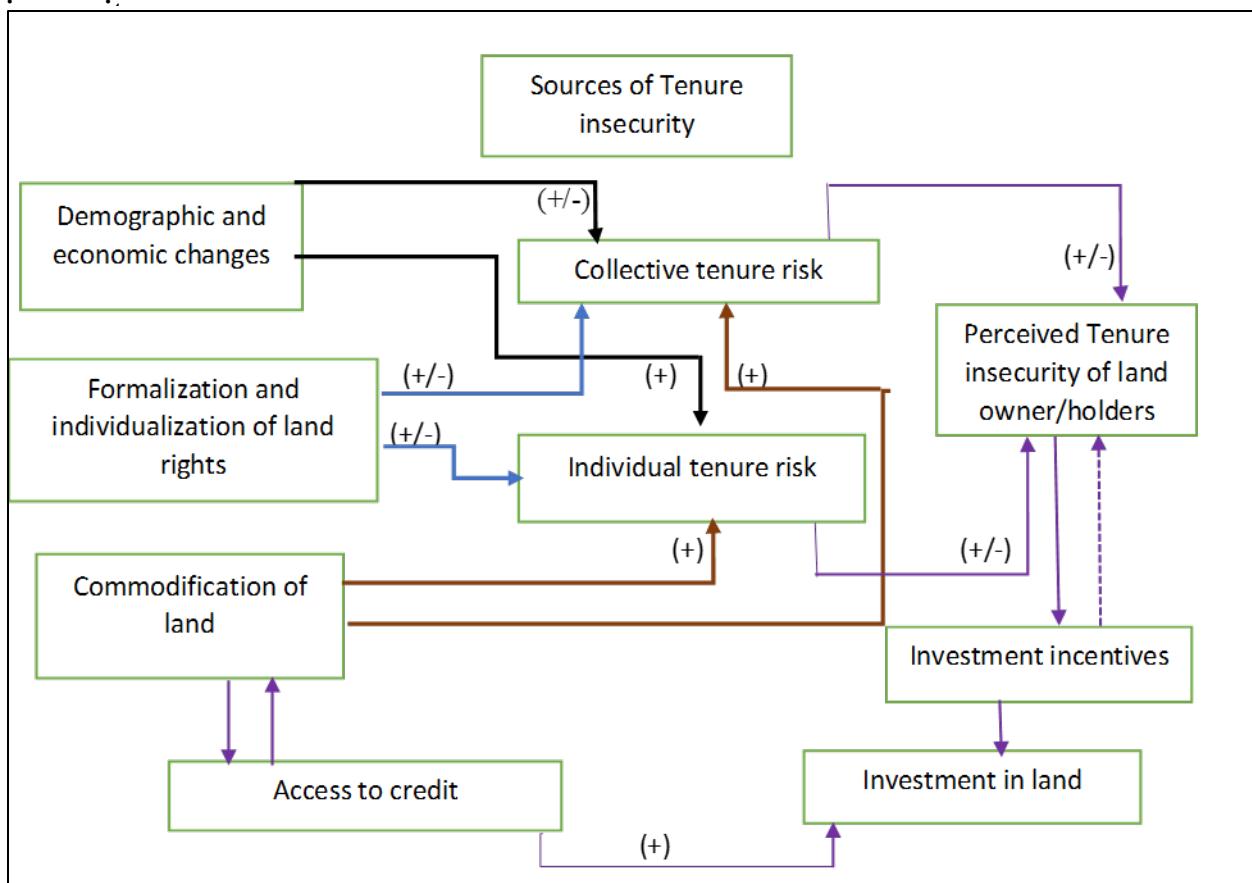
The variation in the definition and measurement of tenure security used in the studies may be one contributing factor to the inconclusive results on the linkage between tenure security and economic benefits (Persha et al. 2015; Arnot et al. 2011). Broadly, tenure insecurity is measured objectively (the existence of formal land titles) or subjectively (land holders' perception of the risk of losing land) in the empirical research. Simbizi (2016) developed an indicator-based framework to measure tenure security from a rural pro-poor perspective, paying special attention to the Sub-Saharan tenure systems. The indicators are based on the interaction between people (individuals or households), public institutions, social and customary institutions, the continuum of land rights and restrictions, and physical land and land information.

This study focuses on the question "what determines land tenure insecurity?" in the context of Mozambique. Here, land tenure insecurity is defined in two major ways, following Ghebru (2015): individual tenure risk; and collective tenure risk. The first definition considers individuals' perception regarding the risk of losing land ownership or use rights due to inheritance, divorce, or encroachment by individuals. The second definition of tenure insecurity depends upon individuals' collective perception regarding the risk of losing their land ownership or use rights in the future due to local or foreigners or government interest on the land i.e. risk of losing land rights due to land needed by the government for public use or by private investor. Tenure insecurity of individuals/households may depend on demographic and economic changes, formalization of land rights, land market activities, community specific factors, etc. (Ghebru and Lambrecht 2017). However, the effect of these factors on tenure insecurity may vary depending on the sources of tenure insecurity. Besides, this study will try to see the differential effect of the determinants of tenure insecurity among males and females within the same household, using a gender-disaggregated dataset. Differentiating the analysis by the sources of tenure insecurity and gender will be relevant to taking policy actions which are compatible with each type of tenure risk and responsive to gender differences.

Based on the above discussion, a conceptual framework for the drivers of tenure insecurity differentiated by the sources of tenure insecurity is illustrated in Figure 2.1. The first driver, indicated by bold dark arrows, shows the effect of demographic and economic changes on the two sources of tenure insecurity. An increase in population growth would increase population density, which will intensify the competition to get arable land. On the other hand, economic changes such as commercialization of agriculture and expansion of urban centers will increase the value of land due to

higher demand from the agricultural and non-agricultural sector (Cotula et al. 2004). Demographic changes might lower the tenure security of land holders since land disputes and conflicts may arise as a result of increased land value (Cotula et al. 2004). On the other hand, urbanization and commercialization of agriculture also threaten the tenure security of land holder since they increase the non-agrarian segment of the population, including public officials, businessmen, politicians, and other seeking to buy agricultural land for residential, commercial agriculture and speculative purposes (Chimhowu and Woodhouse 2006). However, demographic and economic changes might lead to improved tenure security through creating demand for individualization of land rights (Cotula et al. 2004). Hence, demographic and economic changes have positive and negative effects on both individual and collective tenure risks.

**Figure 2.1 Conceptual framework of the drivers of land tenure**



Source: Adapted from Ghebru and Lambrecht (2017).

Note: Different arrow colors distinguish among different drivers of tenure insecurity.  $(+)$  = A positive effect on tenure security.  $(+/-)$  = Combined positive and negative effects on tenure security.

Second, formalization of land rights has positive and negative effects on both types of tenure insecurity as indicated by the blue arrow in Figure 2.1. Granting proof of ownership in the form of formal registered titles will positively affect tenure security by decreasing the probability of a land dispute and land owners'/holders' fear of losing land due to government expropriation or a private dispute (Besley and Ghatak 2010; Bouquet 2009). On the contrary, formalization will put women, especially the

poorest, least educated women, at a disadvantage due to the associated high cost of obtaining land titles and the gaps in understanding the land laws and procedures (Hartwig and Houngbedjino 2015). Thus, the effect of the formalization of land rights on tenure insecurity is indeterminate.

Third, the effect of land market activities (commodification of land) on tenure security is shown by the bold brown arrows in Figure 2.1. Land markets in the form of sale, rent/lease, or sharecropping is assumed to increase productivity by transferring land from less productive, land-abundant farmers to more productive, land scarce users. However, it has an adverse effect on the tenure security of land owners/holders (Holden et al. 2008, cited in Holden and Otsuka 2014). First, the incidence of conflict will be higher due to the economic benefits in relation to an increased value of land (Chimhowu and Woodhouse 2006; Boudreax and Sacks 2009). Second, most of the time, formal land markets are followed by parallel land markets, which are characterized by uncertainty in land ownership because of formally unregistered transactions (Bouquet 2009). Due to these reasons, we expect that commodification of land will have negative effects on tenure security, in cases of both individual and collective tenure security.

Overall, tenure security is influenced by social, cultural and political factors. In many parts of Africa, where the customary tenure system is dominant, women have limited land rights in terms of ownership or inheritance (Cotula and Neves 2007). Even if countries gave recognition to women's land rights under statutory law, the laws' practicability is questionable, particularly in rural areas (Cotula et al. 2004). Besides women, migrants are among the vulnerable groups in terms of land rights. The conflict between indigenous inhabitants and migrants grows with increasing land scarcity and population pressure (Fred-Mensah 1999). In some cases, migrants may be relatively successful and wealthy, which prompts the jealousy of indigenous groups. Hence, these and other factors contributed to a lower level of tenure insecurity among migrants. In addition, the extent of political participation or the connection of land owners/holders with officials/chiefs is also associated with the level of tenure security (Cotula et al. 2004).

### 3 Land Tenure and Tenure Security in Mozambique

In Mozambique, where 70 percent of rural people rely on land and natural resources to lead their life, land is a most valuable resource. After independence from Portuguese colonial rule in 1975, the then-leading party, Frelimo, declared a Marxist-Leninist government in which all land was owned by the State. After independence, however, a civil war took place between the Frelimo and Renamo parties, partly because of state enterprises' failure due to destruction of administrative structure and lack of government resources (Burr 2004). The 17-year civil war ended with a peace agreement between the two parties followed by multiparty elections in 1994. The emergence, following the return of refugees and internal displaced people, of land conflicts which were beyond the capacity of customary institutions and the government necessitated the design of a new land policy (De Quadros 2003). Consequently, a new National Land Policy in 1995 and a Land Law in 1997 were formulated after a participatory process including international donor agencies, political parties, religious groups, traditional authorities, the private sector, academic institutions, and Mozambican NGOs. The Land Policy and Land Law both recognize the customary tenure system and the role of local leaders in conflict management, land allocation, and registration of land use rights (Filipe and Norfolk 2017).

According to the 1997 Land Law, "the land is the property of the State and cannot be sold or otherwise alienated, mortgaged, or encumbered." However, three conditions were defined in which communities, local people, and investors could gain land use rights; i) local community occupation governed by customary law; ii) good-faith occupation (after using the land for at least 10 years without

objection); and iii) adjudication and allocation of a 50-year lease by the State. Land use rights is granted through issuance of a DUAT (the right of use and benefit of land), which is secure, transferable, renewable, and allows long-term user rights for a period of 50 years.

Nevertheless, even after the introduction of the 1995 Land Policy and 1997 Land Law, land grabbing by elites, political officials, and foreign investors was a major concern for the land rights of local communities (Filipe and Norfolk 2017). In addition, the high cost and complexity of the issuance of DUAT encouraged the government to look for alternative low-cost options for formalization of group land rights in the form of CLD (Ghebru 2015). The CLD approach aimed to empower local communities to use and benefit from their land, in which they have legal rights (Knox and Tanner 2011).

In Mozambique, the demand for land increased both in rural and urban areas following rapid structural changes in the economy and other factors such as population growth, urban expansion, and internal migration. Land became an important economic asset required by local and foreign investors for agriculture, tourism, mining, real estate and forestry (Filipe and Norfolk 2017; Strasberg and Kloeck-Jenson 2002). These factors intensify the pressure on land which deprives rural communities of the access to resources that is essential for their livelihoods and socioeconomic survival. These changes especially affect the interests of poor communities with limited access to information and laws to protect their rights, in terms of equitable land allocation and land administration (Filipe and Norfolk 2017).

Under the customary system, access to land is mainly through inheritance, allocation by community leaders via requests, land clearing, buying, and borrowing (Tique 2002). Even if the law prohibits land markets, the purchase and sale of land is a common public practice. One form of land market is community land markets where private investors agree to pay for the land through agricultural produce, construction of schools or clinics, or hiring labor from the community, sometimes consulting community leaders to get access to land for investment. The other form of land market is private land markets. Private land markets started after the privatization of companies that raised the demand of land for investment. Private land markets could include internal markets within communities, urban people purchasing land from rural people, or private groups and individuals coming from South Africa and Zimbabwe to rent land for farming. Selling land to foreigners using Mozambican partners was seen in many parts of the country. These phenomena created a perception of land scarcity on the farmers' side (Tique 2002). Filipe and Norfolk (2017) argued that communities are losing access to better quality land following commodification of land and land scarcity. Similarly, vulnerable groups in these communities—women, widows, orphans, the poor and elderly—are also losing land due to land being taken by more powerful villagers through distress sales and encroachment by neighbors.

Women have insecure land rights since the daily lives of rural women are regulated by customary laws and traditional practices that favor men (Knox and Tanner 2011). Ninety-three percent of women are involved in agricultural activities but only 20 percent of women have more than 2 hectares of land. Despite their engagement in farming, women acquire access and use rights to land through their husbands, fathers, uncles, and other male relatives under customary law (FAO 2016). The 1997 Land Law awards women the right to participate in all land-related decisions and the right to register DUATs individually. However, the law has little impact since many women are not familiar with the formal laws and lack financial resources and mobility to enforce their rights (Knox and Tanner 2011).

Regarding the inheritance rights of women, the spouses are equally entitled, in the revised Family Law, to half of the goods purchased together after the dissolution of marriage caused by death or other

reasons (FAO 2016). However, the inheritance rights of widows or divorced women differ when it comes to customary law. In the southern part of the country, where a patrilineal system is practiced, the women are forced to leave the husband's household and return to her family. Whereas, a matrilineal system prevails in the northern part of the country. And in the case of the husband's death, the wife can stay with her husband's family with her children, where an inheritance right to land is bestowed on the first-born son (FAO 2016). Hence, the gaps in implementation of the law and customary practices might result in a lower level of tenure security among women.

Political power and economic resources are other factors that determine the status of land tenure security in Mozambique. Farmers and other residents rely on money and political connections to access land to satisfy basic needs of food, livelihoods, and home. The poor are left with fragmented and less productive lands as more land is allocated to the rich (Filipe and Norfolk 2017). Consequently, existing land owners develop a sense that their families and future generations are losing their land, with increasing population density making it difficult for other farmers to buy or rent additional land they need for cultivation (Filipe and Norfolk 2017).

## 4 Data and Method

### 4.1 Data

This study aims to assess the drivers of tenure insecurity in Mozambique. For this purpose, data for this study came from two surveys. The first survey, Mozambique's TIA, covered 6,194 households from ten provinces and was conducted by the Ministry of Agriculture and Food Security (MASA) in 2014. The second survey, a gender-disaggregated Supplemental Land Tenure Survey, was conducted by the International Food Policy Research Institute (IFPRI) in 2015 by revisiting 3,556 households in seven (rural) provinces (except the three Southern provinces of Gaza, Maputo and Inhambane, where smallholder agriculture is less prevalent) that were interviewed during TIA 2014. The supplemental survey collected much-needed data on details of intra-household access to and control over land, land transfer (lease or inheritance) activities, household and farm-specific indicators of perceived tenure (in)security, and knowledge of the existing land law—which were not well captured in the TIA dataset. Such unique data enabled us to analyze the role social and economic transformations play in dictating the perceived tenure security of individuals with varying social status by comparing the within- and across-household differential effects. Since potential policy prescriptions to address issues of tenure insecurity vary depending on the nature of the tenure security, key contributions of this study include the following:

- i. Disaggregated analysis of the drivers of two types of tenure insecurity: namely, collective tenure risk (fear of land loss), as well as individual tenure risk (risk of encroachment);
- ii. Gender-differentiated analysis of the drivers of the two types of tenure insecurity. Not only does our dataset enable us to conduct the conventional gender analysis comparing principal males with principal females (inter-household analysis) but it also enables us to conduct intra-household analysis comparing differential implications on principal males versus spouses. Table 4.1 below shows the composition of our sample with regard to these three groups. Overall, the sample used consists of responses from 5,076 individuals: 2,350 principal male respondents, 928 principal female respondents, and 1,798 female spouses.

The sense of tenure insecurity might be based on households' perception of land loss or their disputes over land ownership/use rights or might arise from local or global phenomena that could potentially

affect households' land rights (Ghebru 2015). Hence, we use two types of tenure insecurity indicators. These indicators help us to see tenure insecurity from the perspective of future risk, which could be individual (idiosyncratic) or collective (co-variate).

Table 4.1: Unique gender-disaggregated Household Sample Composition

Household characteristics	Respondent's gender		
	Female	Male	Total
Head (principal)	928 <sup>A</sup>	2,350 <sup>B</sup>	3,278
Spouse	1,798 <sup>C</sup>		1798
Total	2,726	2,350	5,076

Source: Authors' computation using the Mozambique National Agricultural Survey (TIA survey) 2014 and TIA supplemental survey 2015.

**Note:** Sub sample A and B used for inter-household analysis; hereafter called "Type I" household  
Sub sample B and C used for intra-household analysis; hereafter called "Type II" household

The first tenure insecurity indicator is based on the perceived likelihood of losing land ownership/use rights because of their land being required in the next five years either by the government (public use) or by a private investor. This is called *collective tenure risk* or *risk of land loss*, hereafter. The second tenure insecurity indicator is based on the perceived likelihood of a private land dispute (such as encroachment, inheritance, divorce, etc.) in the next five years. This is called *individual tenure risk*, hereafter. Hence, using these two binary proxies for tenure (in)security, a respondent is considered as tenure insecure if he/she responded yes to the questions which ask about the probability or incidence of each type of tenure risk (ownership of dispute).

## 4.2 Empirical Method

In order to investigate the determinants of land tenure insecurity, a household-level and gender-disaggregated analysis is conducted using a probit estimation method. Thus, the general form of the model (model 1) is presented as follows:

$$\begin{aligned}
 TI_{h,i fe,fp} = & \beta_0 + \beta_1 NI_i + \beta_2 MC_c + \beta_3 LM_c + \beta_4 EV_c + \beta_5 LA_c + \beta_6 PC_h + \beta_7 SC_h + \\
 & \beta_8 PU_h + \beta_9 OC_h + \beta_{10} INH_h + \beta_{11} BM_h + \beta_{12} DD_h + \beta_{13} DT_h + \beta_{14} YA_h + \\
 & \beta_{15} AW_i + \beta_{16} SU_i + \beta_{17} PP_i + \beta_{18} LD_i + \beta_{19} PD + \beta_{20} II_i + \beta_{21} HH_h + \beta_{22} CC_c + \\
 & \varepsilon_i + \varepsilon_h + \varepsilon_c \dots \dots \dots \quad (1)
 \end{aligned}$$

The dependent variables  $TI_{h\ell}$  and  $TI_{hfp}$  are used for a household analysis in which they represent collective tenure risk and individual tenure risk, respectively, for household  $h$ , and  $TI_{ife}$  is used for a gender-disaggregated analysis which denotes collective tenure risk for individual  $i$ , where:

$TI_{\ell}$  takes the value 1 if the respondent perceived that he/she is likely to lose land ownership/use rights due to land being required by the government for public use or land being required by a private investor; and 0, otherwise,

$TI_{fp}$  takes the value 1 if the respondent perceived that he/she is likely to lose land ownership/use rights due to a private land dispute; and 0, otherwise.

Thus, among the two proxies, collective tenure risk is appropriated to conduct both intra-household and inter-household analysis by disaggregating the sample between principal males and the spouses (female), and principal males and principal females, respectively. Definitions and expected signs of key explanatory variables (determinants of perceived tenure security) are presented in Table 4.2.

Table 4.2: Definitions and expected signs of key variables of interest

Explanatory variables	Exp. Sign
$NI_i$ – indicator variable for indigenous respondents, i.e., who are born in current residence village	(+)
$MC_c$ – proxy for intensity of migration, community proportion of households with migrant head or spouse	(+)
$LM_c$ – proxy for land market vibrancy, community proportion of households who participate in land market either through renting/sharecropping in/out, purchasing or borrowing at least one parcel	(+)
$EV_c$ – proxy variable for economic vibrancy, proportion of households with modern roofing material <sup>1</sup>	(+)
$LA_c$ – proxy variable for land abundance, community proportion of households with easy access to land <sup>2</sup>	(-)
$PC_b$ – proxy variable for political connectedness, dummy variable that takes a value of 1 if the household head/relative ever held a position in community offices <sup>3</sup> , and 0, otherwise	(-)
$SC_b$ – proxy variable for social connectedness dummy variable that takes a value of 1 if the household head has active participation in community issues <sup>4</sup> , and 0, otherwise	(-)
$PU_b$ – dummy for a household with at least one plot acquired via purchase	(-)
$OC_b$ – dummy for a household with at least one plot acquired via occupation	(+)
$INH_b$ – dummy for a household with at least one plot acquired via inheritance	(-)
$BM_b$ – dummy for a household with at least one plot with manmade boundary marking	(+)
$DD_b$ – dummy variable, 1 if a household has demand for new land demarcation to make borders/boundaries of a parcel clearer, and 0, otherwise	(+)
$DT_b$ – dummy variable, 1 if a household obtained a DUAT for at least one parcel, and 0, otherwise	(+)
$YA_b$ – number of years since acquisition of first plot	(-)
$AW_i$ – dummy for a respondent who has awareness about land laws and procedures	(+)
$SU_i$ – dummy variable, 1 if a respondent thinks survey and demarcation help to reduce risk of dispute and increase the chance of getting compensation in the event of expropriation, and 0, otherwise	(+)
$PP_i$ – dummy variable, 1 if the respondent has ownership right or has some form of involvement in plot management/decision making/labor or money contribution, and 0, otherwise	(-)
$LD_i$ – dummy variable, 1 if the respondent received legal advice on land-related matters from formal or informal sources, and 0, otherwise	(+)
$PD$ – dummy for provinces in Mozambique (reference group is Niassa)	(+/-)
$II_i$ – other individual-level variables	(+/-)
$HH_b$ – other household-level variables	(+/-)
$CC_c$ – other community-, village-, or cluster-level variables	(+/-)
$\epsilon_b, \epsilon_h, \epsilon_c$ – error terms at individual, household, and community-level	

Source: Authors' definition of variables from datasets of the Mozambique National Agricultural Survey (TIA survey) 2014 and TIA supplemental survey 2015.

**Notes:** DUAT = individual right protections; Exp. Sign = expected sign.

<sup>1</sup> Modern roofing material is defined as a house roof made of metal sheet, zinc, or tiles.

<sup>2</sup> Easy access to land means if an individual perceives that it is very easy or easy to acquire land via allocation, inheritance/gift, purchase, occupation, borrowed for free or rent/sharecrop-in in the next five years.

<sup>3</sup> Position in community offices refers to positions held in either of the following places: post-administrative council (head, security committee, election committee, etc.), local committee (head, security committee, election committee, etc.), local community, ward community, or *bairro* (judge, secretary, etc.).

<sup>4</sup> Active participation in community issues is defined as engaging in at least one of the following activities: voting in an election, contacting an elected representative, actively participating in an information campaign or making a personal contact with an influential person about a community issue.

#### 4.3 Robustness checks and sensitivity analysis

The robustness of the results for the key variables of interest—the variables' statistical significance and respective expected signs—is tested by running eight distinct regressions models using a series of alternative model specifications. The sensitivity analysis used the pooled sample intra-household gender disaggregated data. Thus, sensitivity analyses (as shown in Table 4.3 below) were conducted using three parameters: i) parametric regressions with and without households where most of their plots are not located inside their holding<sup>1</sup> ii) regressions with versus without households where most of their own-hold plots are not cultivated<sup>2</sup>; and iii) regressions by relaxing the definition of family size variable, with versus without non-resident members of the household<sup>3</sup>.

Table 4.3 Model specifications used for sensitivity analysis

Models	Sample				Observations
	Includes households without plot (s) located inside the holding	Excludes households without own-hold cultivated plot (s)	Family size variable excludes nonresident members		
1	No	Yes	Yes		2,000
2 <sup>+</sup>	Yes <sup>+</sup>	No	No		3,152
3	Yes	Yes	Yes		2,988
4	No	Yes	No		2,000
5	No	No	Yes		2,078
6	Yes	No	Yes		3,152
7	Yes	Yes	No		2,988
8	No	No	No		2,078

Source: Authors' definition using datasets of the Mozambique National Agricultural Survey (TIA survey) 2014 and TIA supplemental survey 2015.

**Note:** <sup>+</sup> Same model specification reported as the main findings under Table 6.1 – Model 2.

<sup>1</sup> This parameter is used for sensitivity analysis since households in these groups are assumed to have different characteristics.

<sup>2</sup> This parameter is used for sensitivity analysis since households in these groups are assumed to have different characteristics.

<sup>3</sup> This is used in the sensitivity analysis because non-resident household members are also considered in the case of intrahousehold land distribution (Ghebru and Lambrecht 2017).

## 5 Descriptive Analysis

Land tenure insecurity is proxied by indicators which show potential tenure risk. Thus, the study uses two tenure insecurity indicators: collective tenure risk and individual tenure risk, based on individuals' perception of the likelihood, in the next five years, of losing land ownership/use rights either because of their land being required by the government (public use)/private investors (collective tenure risk) or because of private disputes (individual tenure risk). These definitions hold for the rest of the discussion in the descriptive analysis. The analysis is done both at the household level and disaggregated by gender.

Overall, results from Table 5.1 show a high level of collective tenure risk, with 1/3 of the households reporting fear of land loss due to expropriation by the government or eviction by a private investor while only 10 percent of households report individual tenure risk. Comparing principal males (male heads) with principle females (female heads), results show that collective tenure risks are the real threat to women's tenure security while individual tenure risks (ownership, inheritance, border dispute, etc.) are more of a threat to the tenure security of males (men). Mean comparisons among groups of tenure secure versus tenure insecure households also show that a higher level of tenure insecurity is more prevalent among those households who have reported to be demanding interventions on demarcations of parcels. This is consistent when both indicators of tenure insecurity are taken into account—both private as well as collective tenure risks. Being a land-abundant household, a household with a recent history of land acquisition, or both is associated with prevalence of individual tenure risk while these factors seem to have no or little significant association with collective tenure risk. Similarly, those households who happen to have a history of credit (the household either has borrowed or attempted to borrow in the past or is currently borrowing) have revealed higher private tenure insecurity while such credit history seems to have no or few implications for collective tenure risk.

Although the household head's overall literacy (household head ever attending school) shows a negative correlation with a higher level of individual tenure risk, results show that legal literacy is associated with less fear of land loss (higher collective tenure security) while the opposite is true for individual tenure risk. However, such a negative correlation between individual tenure risk and legal literacy can be explained by the fact that this could be indicative of reverse causality. Households with higher perceived individual tenure risk may invest (or may be targeted for interventions) in legal literacy to a greater degree than those which appear to have a lower likelihood of perceived tenure insecurity caused by encroachment risks and other private-related causes.

Table 5.2 presents a mean comparison of land tenure insecurity indicators, legal literacy and access to/control over land among the three groups of individuals in our sample: namely, male (head) and female (spouse), and female-headed households. Results show that the prevalence of perceived tenure insecurity (individual tenure risk) is significantly higher among female spouses compared to principal males (male heads) as well as principal females (female heads). Similarly, female spouses seem to be the most disadvantaged group when their access to and control over land is compared to both the male heads and female heads. Comparing the legal literacy level of male heads with their female spouse counterparts, results show a significantly higher proportion of male heads to have received legal advice on land related matters, have awareness about land acquisition and dispute resolution mechanisms than female spouses. The result also shows a significant difference between male and female respondents in general (both female spouses and female heads) with access to and control over land favoring male heads.

Table 5.1 Household characteristics and mean comparison by tenure insecurity indicators

Variables	All	Collective tenure risk (fear of land loss)		Individual tenure risk (risk of encroachment)	
		No	Yes	No	Yes
<b>Tenure insecure</b>		0.323		0.115	
<b>Head is male</b>		0.771	0.694***	0.968	0.981**
<b>Polygamous marriage</b>	0.033	0.036	0.046	0.032	0.038
<b>Household size</b>	5.424	5.550	5.611	5.420	5.462
<b>Demand for demarcation</b>	0.494	0.400	0.571***	0.463	0.734***
<b>Number of plots</b>	2.989	3.005	2.971	2.949	3.302***
<b>Number of years since last plot acquisition</b>	9.539	9.254	9.442	9.644	8.731*
<b>Household with at least one permanent migrant</b>	0.233	0.220	0.254**	0.230	0.236
<b>Types of legal advice received by a household</b>					
<b>How to acquire DUAT</b>	0.038	0.049	0.031**	0.027	0.126***
<b>How to resolve land dispute</b>	0.071	0.084	0.059**	0.058	0.173***
<b>The benefits of DUAT</b>	0.034	0.047	0.025***	0.026	0.099***
<b>How to appeal expropriation</b>	0.028	0.044	0.015***	0.021	0.088***
<b>Age of the head</b>	41.848	42.596	41.944	41.874	42.209
<b>Head is indigenous</b>	0.712	0.738	0.661***	0.709	0.739
<b>Head attended school</b>	0.784	0.822	0.831	0.789	0.750*
<b>Head has credit history</b>	0.110	0.119	0.119	0.103	0.168***
<b>Observations</b>	5,076	5,076		5,076	

Source: Mozambique National Agricultural Survey (TIA survey) 2014 and TIA supplemental survey 2015.

**Note:** DUAT = individual right protections. \*\*\* is <=1%, \*\* is 5% and \* is 10% level of significance.

Table 5.2 Tenure insecurity indicators and mean comparison among male heads, female heads and female spouses characteristics

Variables	All	Female spouse	Male head	Female head
<b>Individual tenure risk</b>	0.135	0.151	0.106**	0.092***
<b>Types of legal advice received by a household</b>				
<b>How to acquire land</b>	0.080	0.069	0.091**	-
<b>How to resolve land dispute</b>	0.067	0.059	0.076**	-
<b>Any legal advice</b>	0.091	0.076	0.105***	-
<b>Respondent has ownership right of a parcel</b>	0.877	0.800	0.954***	0.904***
<b>Respondent made business decision on the plot</b>	0.828	0.711	0.946***	0.870***
<b>Respondent managed income/output generated from a parcel</b>	0.836	0.734	0.939***	0.869***
<b>Observations</b>	5,076	1,798	2,350	928

Source: Mozambique National Agricultural Survey (TIA survey) 2014 and TIA supplemental survey 2015.

\*\*\* is &lt;=1%, \*\* is 5% and \* is 10% level of significance.

## 6 Econometric Analysis

Table 6.1 reports results for two specifications of tenure insecurity indicators: individual tenure risk (Model 1) and collective tenure risk or fear of land loss (Model 2). Initially, the conventional gender analysis was conducted by comparing just the principal male versus the principal female (type-I households as described in Table 4.1) and only vectors of interaction terms for male respondents were used to account for gender differential effects. However, as argued in section 4, we expect the conventional gender analysis comparing male- and female-headed households to have conceptual flaws as these households not only vary in the gender of the head but also in a host of various social and economic parameters. Hence, we conduct a disaggregated analysis of Equation (1) on a sub-sample of the three groups of respondents in our sample: principal males, principal females, and female spouses (as reported in Table 4.1 as datasets A, B, and C, respectively). Such analysis not only helps in accounting for each potential driver of tenure insecurity's slope effects on these three groups of respondents but also controls for the heterogeneity in social and economic parameters among these groups. Table 6.2 reports estimates of drivers of collective tenure risk on sub-samples of female spouses (model 1), principal males or male-headed households (model 2) and principal females or female-headed households (model 3). Hence, the gender-disaggregated analysis in Table 6.2 aims to show the estimated differential effects of each potential driver of tenure insecurity by comparing not only principal males (male heads) with principal females (female heads), but also by comparing, through intrahousehold analysis, male heads with their female spouses as well as female heads versus female spouses.

Table 6.1 Factors associated with perceived insecurity of tenure - Household level (marginal effects)

Explanatory variables	Model 1		Model 2		
	ME (se)		ME (se)		
Gender-Male	-0.042*	(0.04)	0.076***	(0.03)	
Experience of dispute	0.049**	(0.02)	0.034*	(0.02)	
Respondent in polygamous marriage	-0.017	(0.04)	0.002	(0.05)	
Respondent is indigenous	-0.004	(0.02)	-0.073****	(0.02)	
Political connectedness	-	0.087****	(0.02)	-0.021	(0.02)
Social connectedness	-	-0.058***	(0.02)	-0.115***	(0.04)
Respondent attended school	-	0.070****	(0.02)	-0.019	(0.02)
Respondent thinks survey and demarcation reduce risk of dispute and increase compensation	-0.045**	(0.02)	-0.180****	(0.02)	
Received legal advice on land-related matters	0.127****	(0.02)	-0.016	(0.03)	
Has awareness about land laws and procedures	0.045***	(0.02)	-0.009	(0.03)	
Respondent practices non-farm activity	-0.005	(0.02)	0.136****	(0.02)	
Respondent has access to land†	-0.017	(0.05)	-0.110***	(0.03)	
Respondent has credit demand	0.034*	(0.02)	-0.070**	(0.03)	
Respondent has personal savings account	0.045**	(0.02)	0.061**	(0.03)	
Community-level land market vibrancy††	0.082***	(0.03)	0.153****	(0.04)	
Community proportion of households where the head or spouse are migrants	0.110***	(0.03)	-0.043	(0.04)	
Community-level economic vibrancy†††	-0.087***	(0.03)	0.099***	(0.04)	
Community-level land abundance††††	-0.006	(0.02)	-0.077**	(0.04)	

Explanatory variables	Model 1		Model 2	
	ME (se)	ME (se)	ME (se)	ME (se)
Plot is occupied	-0.037*	(0.02)	-0.070***	(0.02)
Plot is purchased	-0.032	(0.02)	-0.162****	(0.03)
Plot is inherited	-0.029	(0.02)	-0.038	(0.02)
Plot with man-made boundary marking	0.029*	(0.02)	0.035*	(0.02)
Plot cultivated with permanent crops (trees)	-0.037**	(0.02)	-0.117****	(0.02)
Log of farm size (in hectares)	0.008	(0.01)	0.028***	(0.01)
Household has demand for new land demarcation	0.101****	(0.01)	0.159****	(0.02)
Household has title for a plot	0.004	(0.04)	-0.269****	(0.06)
Joint F-test for other individual characteristics <sup>i</sup>	15.12**		21.74***	
Joint F-test for other household characteristics <sup>ii</sup>	12.61**		94.33****	
Joint F-test for community characteristics <sup>iii</sup>	43.18****		80.01****	
Pseudo R2	0.2211		0.1748	
Observations	2072		3152	
Prob>Chi2	0		0	

Source: Mozambique National Agricultural Survey (TIA survey) 2014 and TIA supplemental survey 2015.

**Notes:** For Model 1 the dependent variable is individual tenure risk (dummy variable equal to 1 if household perceived that there is likelihood/risk of private land dispute; and 0, otherwise). For Model 2 the dependent variable is collective tenure risk (dummy variable equal to 1 if household perceived that there is likelihood/risk of land expropriation by the government or concession by private investor; and 0, otherwise).

† 1 if the respondent has ownership right or has some form of involvement in plot management/decision making/labor or money contribution, and 0 otherwise.

†† A dummy equals to 1 if community proportion of households who participate in the land market through land purchase, rent/sharecrop in/out, or borrowed, is above the median proportion, and, zero otherwise.

††† A dummy equals to 1 if community proportion of households who have house with modern roofing material is above median proportion, and, zero otherwise.

†††† A dummy equals to 1 if community proportion of households who perceive that they will have easy access to land in the next five years is above the median proportion, and zero otherwise.

i Individual characteristics include the following variables: age of the respondent, respondent perceive it is easy to get land, respondent's religion.

ii Household characteristics include the following variables: household size, household has other type of legal document for plot, household spent time and/or money on boundary marks on plot(s), plots' average distance from household residence, plot has physical soil and water conservation structure, number of years since first plot acquisition, used pesticide, used chemical fertilizer, used irrigation.

iii Community characteristics include the following variables: community-level average farm size per capita and dummy for the six Provinces (Cabo Delgado, Nampula, Zambezia, Tete, Mancia, Sofala by taking Niassa as reference group)

Figures in parentheses are standard errors; \*\*\*\* significant at 0.1%; \*\*\* significant at 1%; \*\* significant at 5%; \* significant at 10%.

## 6.1 Drivers of perceived tenure insecurity: Aggregate

As depicted in Table 6.1 above, the determinants of tenure insecurity are compared along the two tenure insecurity indicators: individual tenure risk and collective tenure risk. The factors which affect tenure insecurity differ based on the source of tenure insecurity. Past experience of land-related disputes, prevalence of land-market activities, and possession of land with man-made boundary markings are estimated to have a deterring effect on the likelihood of both

individual and collective tenure security while social connectedness of respondents, possession of parcels planted with permanent crops, and acquisition of a parcel via occupation are estimated to enhance tenure security irrespective of whether tenure insecurity is individual or collective tenure.

However, in line with the conceptualization of this study that policy prescriptions aimed at enhancing tenure security should be tailored to account for the source of tenure security, a host of individual, household, and community-level variables have contrasting effects on the two sources of tenure insecurity. While involvement in non-farm activities and possession of larger land holdings are estimated to be associated with a higher likelihood of fear of land loss (collective tenure risk) these variables seem to have no significant effect on dictating individual tenure risks.

Similarly, while whether a household is indigene, as well as community-level land abundance, seems to matter less in influencing perceived private tenure insecurity, both variables (being an indigene household and residing in less [land]-stressed areas) are estimated to reduce fear of land loss due to expropriation (collective tenure risk). The latter is consistent with the findings by Deininger et al. (2018) showing, in predominantly customary tenure systems, collective tenure risk (risk of land loss) is higher for strangers as compared to the locals.

Coefficients on legal literacy and village-level variables on the level of diversity within a community are associated with a higher probability of individual tenure risk but not collective tenure risk. The former could be due to effective targeting of programs involving legal literacy (paralegal aid) in areas with higher prevalence of individual tenure risks. Similarly, given that a customary tenure system is subject to a lack of transparency and prone to substantial subjective interpretations on matters of land allocation, land-related dispute resolutions, or both, political connectedness/affiliations appears to matter most in reducing individual tenure risk (such as risk of disputes related to encroachment, border, inheritance, etc.), while it has no significant effect in influencing the likelihood of collective tenure risk.

## 6.2 Determinants of perceived tenure insecurity (fear of land loss): Gender-disaggregated

Table 6.2 describes the regression results of intra-household and inter-household gender-disaggregated analysis for the drivers of tenure insecurity. The result using the pooled sample (which includes all three groups) shows perceived tenure insecurity (fear of land loss) is more prevalent for female spouses as compared to the control group –that is, principal females (female heads). This could be due to the fact that, in addition to the common tenure security risks that may equally affect female heads and female spouses, women as spouses face an additional risk of losing their land to their male partners – especially, in countries such as Mozambique with patrilineal systems (Arnaldo 2004). This is consistent with findings from a similar study by Ghebru and Lambrecht (2017) in Ghana, in which perceived tenure insecurity was found to be higher for women in male-headed households. Results reported in Models 1- 3 of Table 6.2 further illustrate, by gender and social status, the factors associated with perceived tenure (in)security for the various groups.

Table 6.2 Factors associated with perceived insecurity of tenure - Gender disaggregated (marginal effects)

Explanatory variables*	Pooled sample	Inter-household		
		Model 1†	Model 2‡	Model 3§
Male head	0.151**** (0.02)			
Female spouse	0.217**** (0.02)			
Experience of dispute	0.092**** (0.02)	0.043* (0.03)	0.057** (0.03)	0.081** (0.04)
Age of the respondent	0.001* (0.00)	-0.001 (0.00)	0.001 (0.00)	0.003*** (0.00)
Respondent in polygamous marriage	-0.007 (0.04)	-0.297*** (0.11)	0.049 (0.05)	-0.030 (0.16)
Political connectedness	-0.019 (0.02)	-0.036 (0.03)	-0.056** (0.03)	0.050 (0.04)
Social connectedness			-	
	-0.141**** (0.02)	-0.125*** (0.04)	0.142**** (0.03)	-0.101** (0.05)
Respondent is indigenous	-0.064**** (0.02)	-0.027 (0.03)	-0.035 (0.04)	-0.042* (0.02)
Respondent thinks demarcation reduces risk of dispute and increases compensation		-0.175**** (0.03)	-0.056** (0.03)	
Respondent received legal advice on land-related matters	-0.004 (0.03)	-0.108** (0.05)	0.182**** (0.03)	-0.112** (0.06)
Respondent has access to land†	-0.067** (0.03)	-0.174**** (0.04)	0.043 (0.07)	0.058 (0.07)
Respondent practices non-farm activity	0.117**** (0.02)	0.180**** (0.03)	0.075**** (0.02)	0.105*** (0.04)
Community-level land market vibrancy††	0.142**** (0.03)	0.239**** (0.04)	0.097 (0.06)	0.033 (0.06)
Community proportion of households where the head and/or spouse are migrants	0.051 (0.03)	0.031 (0.04)	0.142**** (0.04)	0.091* (0.05)
Community-level economic vibrancy††	0.060** (0.03)	0.081 (0.05)	0.083** (0.04)	0.034 (0.06)
Community-level land abundance†††	-0.059** (0.02)	-0.057 (0.04)	-0.044 (0.03)	-0.099* (0.05)
Plot is occupied	-0.072**** (0.02)	-0.080** (0.03)	-0.056** (0.03)	-0.033 (0.04)
Plot is purchased			-	
	-0.160**** (0.02)	-0.164**** (0.04)	0.212**** (0.03)	-0.078 (0.05)
Plot is inherited	-0.057*** (0.02)	-0.038 (0.03)	-0.045 (0.04)	-0.076** (0.04)
Plot with manmade boundary marking	0.015	0.025	0.000	-0.055

Explanatory variables <sup>y</sup>	Pooled sample	Inter-household		
		Intra-household		
		Model 1 <sup>†</sup>	Model 2 <sup>#</sup>	Model 3 <sup>##</sup>
Plot cultivated with permanent crops (trees)	(0.02)	(0.03)	(0.02)	(0.04)
Household has no need to obtain DUAT	-0.143**** (0.02)	-0.084*** (0.03)	0.093**** (0.02)	-0.065* (0.04)
Household has title for a plot	-0.242**** (0.05)	-0.196** (0.08)	-0.090 (0.06)	-0.344** (0.16)
Log of farm size (in hectares)	0.021*** (0.01)	0.017 (0.01)	0.025 (0.03)	0.035** (0.02)
Joint F-test for other individual characteristics <sup>i</sup>	27.29****	18.75**	40.70****	32.53****
Joint F-test for other household characteristics <sup>ii</sup>	85.96****	57.13****	25.56***	13.75
Joint F-test for community characteristics <sup>iii</sup>	62.27****	42.32****	54.56****	44.10****
Pseudo R2	0.1422	0.1842	0.1937	0.2187
Observations	4380	1574	2039	767
Prob>Chi2	0.0000	0.0000	0.0000	0.0000

Source: Mozambique National Agricultural Survey (TIA survey) 2014 and TIA supplemental survey 2015.

Notes: DUAT = individual right protections.

<sup>y</sup>The dependent variable is collective tenure risk, which is a dummy variable equal to 1 if household perceived that there is likelihood/risk of land expropriation by the government or concession by private investor; and 0, otherwise)

<sup>†</sup>Regression includes sub-sample of female spouses, <sup>#</sup> Regression includes sub-sample of male heads, <sup>##</sup> Regression includes sub-sample of female heads

<sup>†</sup> 1 if the respondent has ownership right or has some form of involvement in plot management/decision making/labor or money contribution, and 0 otherwise.

<sup>††</sup> 1 if community proportion of households who participate in the land market through land purchase, rent/sharecrop in/out, loan

<sup>†††</sup> 1 if community proportion of households who have house with modern roofing material

<sup>††††</sup> 1 if community proportion of households who perceive that they will have easy access to land in the next five years.

<sup>i</sup> Individual characteristics include the following variables: respondent has awareness about land laws and procedures, respondent attended school, respondent has credit demand, respondent has personal savings account, respondent perceives it is easy to get land, respondent's religion.

<sup>ii</sup> Household characteristics include the following variables: household size, household has other type of legal document for plot, household spent time and/or money on boundary marks on plot(s), plots' average distance from household residence, plot has physical soil and water conservation structure, number of years since first plot acquisition, used pesticide, used chemical fertilizer, used irrigation.

<sup>iii</sup> Community characteristics include dummy for the six Provinces (Cabo Delgado, Nampula, Zambezia, Tete, Mancia, Sofala by taking Niassa as reference group)

Figures in parentheses are standard errors; \*\*\*\* significant at 0.1%; \*\*\* significant at 1%; \*\* significant at 5%; \* significant at 10%.

Key drivers of tenure insecurity for female spouses that have little effect on principal males and principal females are associated with marriage structure and whether or not the respondent has ownership or control over land. Results show that female spouses under polygamous marriage and those with land ownership (has access to or control over land) are the ones with a higher likelihood of tenure security. Such findings are indicative of the joint documentation of rights (joint land titling) as effective measures to enhance the tenure security of married women. Community-level land market vibrancy has a positive and significant effect on perceived tenure insecurity for female spouse only. With increasing land commodification (due to urban expansion and Mozambique being one destination for large-scale, land-based investments), female spouses would become more vulnerable and marginalized as control over resources; the decision to sell or rent property, including land; or both mainly remains in the hands of the husband (principal male). Such findings support the notion that traditional institutions and the protection they can provide matter more for women than for men (Ghebru and Lambrecht 2017; Deininger et al. 2018).

Results also show contrasting effects on perceived tenure security of legal literacy and having a land title when comparisons are made between female (regardless of their social status) and male respondents. Accordingly, while having a title or not doesn't seem to affect the perceived tenure security of male respondents, it is positively associated with enhancing the tenure security of women – both as head of households and spouses. More interestingly, legal literacy has a significant negative effect on the likelihood of female respondents (both as a head and spouse) expressing fear of land loss while the opposite is true for male respondents. Such empirical evidence is a reinforcement of why the SDG indicators for land tenure security that incorporate legal literacy on land matters are considered effective measures of enhancing tenure security, especially targeting women.

On the other hand, social belongingness and relative abundance of land in a community seems to matter the most for perceived tenure security of principal females (female heads) with no/little effect on male heads or female spouses. Perhaps, showing the level of social and economic marginalization that disfavors female heads in Mozambique, being an indigenous (non-migrant) individual seems to be significantly associated with perceived tenure security of female heads, while such indicators seem to matter less for female spouses or principal males. Similarly, residing in communities with relative land abundance matters most for principal females. The result is consistent with similar findings from Ghana (Ghebru and Lambrecht 2017), showing the vulnerability of female heads, especially in areas with relative land scarcity, given that they are most likely to be residual claimants as their ownership and/or control over land is often targeted by in-laws in land-constrained areas. Moreover, age and total farm size are shown to be positively associated with the probability of losing land for principal females while it has little or no effect for female spouses as well as principal males. This could be so since female heads who are older or have larger land-holdings, or both are more vulnerable to land claims by their kin and in-laws. Farm size is also positively correlated with perceived tenure insecurity for principal females. Households with larger tracts of land might be more exposed to land expropriation by the government or private investors due to relatively higher land value. Hence, the chance of land expropriation is higher for the female heads. This is consistent with the empirical findings by Ghebru and Lambrecht (2017), which show farm size to be positively correlated with tenure insecurity in Ghana.

The empirical results confirm anecdotal evidence showing how social and economic transformation in Africa (Mozambique in particular) is eroding tenure security and the protection offered by the customary tenure system in safeguarding land rights in Africa (Mozambique in particular). These empirical results also show that higher perceived tenure insecurity of principal male respondents is associated with being located in areas with relatively active land markets and higher levels of economic

vibrancy while relative concentration of non-indigene households (an indicator of migrant inflow) seems to equally affect (negatively) the perceived tenure security of principal male and female respondents (with no effect on female spouses). Such findings indicate the need for targeting areas with such relatively higher social and economic dynamics to enhance desired tenure security outcomes of households (especially, the predominant male-headed households). Other key contrasting findings from Table 6.2 show that parcels acquired via purchase are associated with perceived tenure security for principal males while inherited land is associated with higher tenure security for principal females.

Finally, regardless of the gender of the respondent or their social status, past experiences of land-related disputes and engagement in non-farm activities are associated with perceived tenure insecurity, while respondents who are socially connected and those who own parcels with permanent trees are the ones with high levels of tenure security. Overall, such contrasting evidence from our gender-disaggregated analysis justifies the scrutiny highlighted in this study with regard to the potential flaws of aggregated analysis in understanding the drivers of tenure insecurity and the resultant blanket solutions (policy measures) to safeguard land rights and thereby enhance tenure security.

A sensitivity analysis is done to test the robustness of the drivers of perceived land tenure insecurity. Table 6.3 shows the results of the sensitivity analyses conducted to test the robustness (sign and significance) for key variables of interest by using alternative model specifications based on three parameters: i) parametric regressions with and without households where most of their plots are not located inside their holding; ii) regressions with and without households where most of their own-household plots are not cultivated; and iii) regressions by relaxing the definition of family size variable, with and without non-resident members of the household. Accordingly, the results of the eight different regressions confirms the robustness of our main results to various alternative model specifications. With two exceptions (indicator for male respondent and community-level land abundance), the variables of interest in the robustness test remain robust and consistent with respect to statistical significance and expected signs.

Table 6.3 Robustness test for factors explaining drivers of perceived land tenure insecurity-Household-level analysis

MODEL	Sample		Signs and significance level of key variables of interest <sup>¥</sup>							
	Includes household s without plot(s) located inside the holding	Excludes household s without own-hold cultivated plot(s)	Family size variable excludes	Gender- Male	Respondent is indigenous	Community- level land market vibrancy <sup>††</sup>	Community proportion of households where the head or spouse are migrants	Community- level economic vibrancy <sup>†††</sup>	Community- level land abundance <sup>†</sup> <sup>†††</sup>	Observations
1	No	Yes	Yes	-0.048**	-0.053*	0.108**	0.094**	0.111**	0.028	2000
2	Yes <sup>+</sup>	No	No	-0.032*	-0.073****	0.175****	0.106***	0.096***	-0.071**	3152
3	Yes	Yes	Yes	-0.030	-0.082****	0.160****	0.121***	0.111***	-0.067**	2988
4	No	Yes	No	-0.048**	-0.053*	0.108**	0.093**	0.111**	0.028	2000
5	No	No	Yes	-0.047**	-0.056**	0.108**	0.092**	0.116**	0.040	2078
6	Yes	No	Yes	-0.032*	-0.073****	0.175****	0.106***	0.096***	-0.071**	3152
7	Yes	Yes	No	-0.030	-0.082****	0.160****	0.121***	0.111***	-0.067**	2988
8	No	No	No	-0.047**	-0.056**	0.109**	0.092**	0.115**	0.040	2078

Source: Mozambique National Agricultural Survey (TIA survey) 2014 and TIA supplemental survey 2015.

**Notes:** <sup>¥</sup> In each regression, the dependent variable is an indicator variable equal to 1 if household perceived that there is likelihood/risk of land expropriation by the government or concession by private investor; and 0, otherwise. <sup>+</sup> Same model specification reported as the main findings under Table 6.1 – Model 2.

<sup>††</sup> 1 if community proportion of households who participate in the land market through land purchase, rent/sharecrop in/out, loan.

<sup>†††</sup> 1 if community proportion of households who have one non-resident member out of the village searching for work or land.

<sup>††††</sup> 1 if community proportion of households who perceive that they will have easy access to land in the next five years.

\*\*\*\* significant at 0.1%; \*\*\* significant at 1%; \*\* significant at 5%; \* significant at 10%.

## 7 Conclusions

The rapid structural changes in the economy, population growth, urbanization and internal migration in Mozambique are creating higher demand for land and, thereby, putting pressure on small land holders and the poor who rely on the customary tenure system (Filipe and Norfolk 2017). Thus, the issue of land access and tenure security has become important in the country. This study investigates the drivers of tenure insecurity using a gender disaggregated household level survey. In order to assess the different dimensions of tenure insecurity, the study uses two types of tenure insecurity indicators for the analysis, namely, collective tenure risk and individual tenure risk. Collective tenure risk and individual tenure risk are based on an individual's perception regarding the likelihood of losing land in the next five years due to expropriation by the government (for public use) or by a private investor; or due to private disputes, respectively. Household-level and gender-disaggregated analysis (intra-household and inter-household) is used to assess the drivers of tenure insecurity.

The results from household-level analysis indicate that the factors have contrasting as well as similar effects on perceived tenure insecurity based on the sources of tenure insecurity. In addition, the significance of the drivers of tenure insecurity varies for private and collective tenure risk. Access to legal advice on land-related matters, engagement in non-farm activities, awareness about land laws and procedures, community-level economic vibrancy, having title for a piece of land, and having credit demand has contrasting effects on individual tenure risk and collective tenure risk. Further, being indigenous, community proportion of migrant households, community-level land abundance, plot acquisition through purchase, having no demand to obtain DUAT for a plot, and farm size significantly affect only collective tenure risk. Whereas, the effect of having political connections and attending school is significant for individual tenure risk. Other factors, such as positive attitudes towards survey and demarcation, having social connections, plot acquisition via occupation, having plots with permanent crops and man-made boundary markings, and community-level land market participation have similar effects on perceived tenure insecurity irrespective of the sources of tenure insecurity.

Further intra-household and inter-household gender-disaggregated analysis is conducted, using collective tenure risk, which is a common indicator to conduct both type of gender analysis. The analysis using the pooled sample of principal males, female spouses, and principal females reveals that female spouses are more likely to perceive risk of losing land ownership/use rights due to government expropriation or concession by private investors as compared to principal females. According to intra-household and inter-household gender-disaggregated analysis, the significance of the factors that affect tenure insecurity is different for principal males and females (spouses and principal). Perceived risk of land expropriation is significantly higher only for principal males who are non-indigenous and who reside in more economically vibrant communities. Whereas, collective tenure risk is significantly lower for female spouses and principal females who have title for at least one plot and who reside in communities with abundant land. Within a household, female spouses who received legal advice on land-related matters are less likely to perceive risk of losing land due to government expropriation or concession by private investors, and the reverse is true for principal males.

We also find that some determinants of perceived tenure insecurity are significant only either for female spouses or principal females. Being in a polygamous marriage, residence in communities with higher land market vibrancy and plot acquisition through purchase and occupation is negatively correlated with collective tenure risk for female spouses. Increased age and farm size increases the likelihood of losing land due to land expropriation or concession only for principal females. Whereas,

principal females who acquire land through inheritance are less likely to perceive collective tenure risk. Some factors such as participation in non-farm activity, social connectedness, having permanent crops on a plot, demand for new land demarcation, and having no need to obtain DUAT have a similar effect on perceived tenure insecurity irrespective of gender.

Overall, the empirical findings from this study reaffirm that social, economic, and demographic transformations have a role in dictating the tenure insecurity of land owners/holders in customary tenure systems. Moreover, the factors that determine tenure insecurity differ between male and female respondents within the same household and across households. In particular, perceived tenure security among female spouses is more sensitive to the changes as compared to that among principal females since land rights of female spouses are threatened both from inside by their partners/families, and from outside by the government or private parties. Hence, beside the efforts made to secure land rights at the household and community level in the country, land tenure reforms should also consider the intra-household dimension in addressing land tenure security. On the other hand, commodification of land and improvement in economic conditions are associated with a higher level of perceived tenure insecurity due to increasing economic value of land. Thus, programs which aim to enhance land tenure security should take into consideration the context and peculiar characteristics of communities during program formulation and implementation phases.

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