



# **Land Tenure Insecurity, Fragmentation and Crop Choice: Evidence from Uganda**

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August 2021 / No.761

## **Abstract**

This study uses household, parcel, and plot-level data to analyze the effect of land tenure insecurity and land fragmentation on crop choice. We use formal land titling as a proxy for de jure land rights, and the perceived transfer rights over parcels as a proxy for de facto land rights. Using two-part model, the study shows that both de jure and de facto land rights significantly increase the likelihood of planting perennial commercial crops, and increase the hectares allocated to commercial crops. The results also show that when the rights to land are weak (i.e., no land titling and no transfer rights), farmers tend to grow annual crops.

Land fragmentation affects more the choice of, and land allocation to, perennial crops than it does for other crop categories. Overall, the results suggest that there is a need for policies and laws that strengthen land tenure security, either through formal land titling or strengthening informal land rights, to promote the production of perennial and other commercial crops.

## Introduction

Land is a major pillar of national development and source of livelihood for most developing countries which rely on agriculture (Lawry et al., 2017; Bugri, 2008). Therefore, factors that impede effective utilization of land have serious implications on economic development and poverty. Land tenure insecurity and land fragmentation are major factors that are prevalent in most sub-Saharan African countries (SSA). Land tenure insecurity is blamed on communal nature of tenure systems in most SSA countries (see Oladele et al., 2011; Bugri, 2008; Sjaastad & Bromley, 1997), while land fragmentation is caused by population explosion and practices of equal inheritance among siblings (Ali et al., 2015). Empirical evidence shows that tenure insecurity reduces investment in land, and impedes efficient land allocation, which in turn affects agricultural productivity (Besley, 1995; Deininger & Jin, 2006; Goldstein & Udry, 2008; Fenske, 2011; Bellemare, 2013; Mwesigye & Matsumoto, 2016). Farmers are less likely to invest in land if they are not sure of recouping the benefits from the investment in future. Land tenure insecurity also affects portfolio choice of crops. A study by Voors et al. (2012), on land insecurity in Burundi, found that households that had land disputes had lower shares of cash crops grown in total production.

Land fragmentation is another factor that affects land use and agriculture performance. Land fragmentation is mainly caused by partible inheritance and population growth. Fragmentation raises the cost of land in borders and of labour in moving among fragments (Eastwood et al., 2010). Land fragmentation leads to increased travel times, more boundary waste, non-feasible small-scale unproductive investments, and increased supervision costs of labour, which negatively impact on-farm activities (Monchuk et al., 2010). It, therefore, follows that addressing tenure insecurity and land fragmentation challenges would help boost agricultural performance in most sub-Saharan African countries. Both tenure insecurity and land fragmentation are endogenous and their net effect on agricultural productivity is ambiguous a priori. Farmers can invest in land to enhance tenure security especially if that investment can reduce expropriation risk (Place & Otsuka, 2002; Deininger & Jin, 2006). In addition, farmers can acquire more parcels of land to diversify crops, and to reduce the likelihood of losing the entire land, especially in areas where land tenure insecurity is high. Therefore, it is important to control for tenure insecurity when examining the agricultural impacts of land fragmentation and vice versa.

Tenure security is a matter of public concern in Uganda. Land in the country is increasingly getting scarce, largely propelled by the rapid population growth rate. Indeed, the country's population growth rate is second in SSA after Niger (Uganda Bureau of Statistics [UBOS], 2016; World Bank, 2018)<sup>1</sup>. Due to land scarcity, land fragmentation has increased, mostly in regions with high population density. Fragmentation of land has attracted government attention, indicated by the president's repeated calls to farmers to consolidate family land and work as groups, rather than sub-dividing it among the children into small, fragmented parcels, to aid agricultural commercialization. The current agricultural sector strategic plan (2015/16 to 2019/20) intends to promote commercialization of prioritized agricultural commodities, especially among smallholder farmers because most of them (about 69%) are still stuck in subsistence production (World Food Programme and National Planning Authority [WFP & NPA], 2017). The plan to promote agricultural commercialization is justifiable as it is one of the critical drivers of poverty reduction and welfare improvement. As such, it is important to understand whether and how land tenure insecurity and land fragmentation can affect commercialization of agriculture in Uganda, through crop choice.

## Uganda's land tenure systems, fragmentation, and policy frameworks

Land is the most important factor for agriculture production in Uganda and its security enhances food and nutrition security (World Food Programme and National Planning Authority [WFP & NPA], 2017). Land tenure security<sup>2</sup> is especially critical for poor people living in rural areas and depending on agriculture for their livelihood. In Uganda, over 78% of the total population lives in rural areas (Uganda Bureau of Statistics [UBOS], 2016) and agriculture employs about 75% of the rural labour force. Land is scarce with the average holding estimated at 1.1 hectares per household and farmers largely practice subsistence farming. Transforming the sector into commercialized agriculture would require increased land investment to enhance crop intensification, and the production of commercial crops. However, there are still low levels of technology adoption in the country. For example, in 2014, 85% of farmers reported that they did not use fertilizers and planted local seed, while

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1 According to World Bank data (2018), Uganda's population growth rate is 3.7% and second in sub-Saharan Africa, after Niger whose population grew at 3.8% per annum in 2018. Other countries with a growth rate more than 3% in SSA include Equatorial Guinea (3.7%), Angola (3.3%), Burundi (3.2%), Democratic Republic of Congo (3.2%), Chad (3.0%) and Tanzania (3.0%) (World Bank, 2018).

2 Livingsage & Mangiafico (2015) define land tenure security as people's ability to control and manage land, use it, dispose of its produce, and engage in transactions, including transfers.

about 6.5% of farmers combined fertilizers and improved seed, suggesting very low levels of intensification. Existing evidence indicates that tenure insecurity has affected agriculture productivity in Uganda (Deininger & Castagnini, 2006; Mwesigye & Matsumoto, 2016). Thus, it is important that farmers gain secure access to land to encourage land investment and increased productivity, because this reduces vulnerability to hunger and poverty.

There are four legally recognized land tenure regimes in Uganda; freehold, leasehold, customary and Mailo, with varying levels of tenure security and land rights (The 1995 Constitution of Uganda). Customary tenure is the dominant system, constituting about 80% of the total land in Uganda. A study by Mwesigye et al. (2017) showed that this tenure regime is evolving from communal to private land ownership due to rural-to-rural migrations and population pressure. In communities where the land rights are more privatized, individuals have full rights to sell and bequeath land they operate without seeking for approval from the extended family or clan members. In other communities where private land rights are weak, individuals are required to seek for approval from clan heads or other extended family members before transferring land; while where land rights are purely communal, transfer rights are restricted. Therefore, customary tenure regime contains private and communal elements (Busingye, 2002). Mailo is another land tenure system in Uganda. In central Uganda (Buganda kingdom), the colonialists introduced the Mailo tenure system where land, about 19,600 square miles, was divided into mile blocks (hence Mailo) and given to chiefs and other officials with their titles in Buganda kingdom through the Buganda Agreement of 1900 (West, 1965; Rugadya, 1999). Former peasants who were cultivating the land never got a share and instead became tenants, obliged to pay rent to title holders. Since then, a landlord-tenant relationship has been created. Landlords' own titles, but tenants have usufruct rights. Since tenants have been on land for long, they consider it theirs which creates overlapping rights, and has catalysed land disputes (Deininger & Castagnini, 2006).

To enhance tenants land rights, the government, through the 1998 Land Act and 2010 Amended Land Act, stipulated that tenants that have been on land for 12 years cannot be evicted by their landlords without full compensation. In addition, the Acts state that if the landlords want to sell land, they would give the priority to current tenants. The laws have thus strengthened land rights of both tenants and occupants on Mailo land (Republic of Uganda, 1998; 2010). Studies have found that the registration of land under Mailo tenure system has not improved investment in land (Deininger & Ali, 2008). This suggests that the overlapping land rights created by Mailo tenure system offset the security that comes with land registration. While other land tenure arrangements have revolved on customary land, Mailo land tenure has not changed much, and it is still characterized by landlords with full rights, and tenants and occupants with limited rights.

Land rights are most secure under freehold and leasehold tenure systems which account for the smallest share of land in Uganda.<sup>3</sup> These two tenure regimes grant land titles to owners which increases tenure security. Individual farmers enjoy full rights such as transfer rights, rights to bequeath and to give, and the right to use land as collateral. Under freehold, land is held in perpetuity and the owner is issued with a title. In leasehold, same full rights are exercised as in freehold up to the expiration of a lease, usually 49 and 99 years.

In 2013, the Government of Uganda formulated a National Land Policy to address land access and tenure security issues. The policy provides a framework for articulating the role of land in national development, land ownership, distribution, utilization, alienability, management, and control of land (Republic of Uganda, 2013). The policy maintains and recognizes the four tenure systems (customary, freehold, leasehold and Mailo) as enshrined in Uganda's constitution. However, as earlier noted, the most predominant system (customary) does not fully guarantee tenure security to the occupants since their rights to transfer the land are restricted. Thus, by analyzing the consequences of restricted land transfer rights (a form or cause of tenure insecurity), the study findings can inform the review of the National Land Policy and strategies.

Furthermore, the National Land Policy recognizes that excessive land fragmentation is a common practice especially in the densely populated areas such as Kigezi highlands and is believed to negatively affect agricultural production potential. The policy identifies strategies to institute public education on the consequences of land fragmentation and sensitize the public on the value of land as a wealth producer and a factor of production. Therefore, this study strongly contributes to the attainment of this strategy by generating research-based evidence on the impact of land fragmentation on investment in agriculture.

Land tenure insecurity has been identified as one of the key causes of low agricultural production and productivity in Uganda. It is said to affect investments on land, especially investments in long-term high value crops such as coffee (WFP & NPA, 2017). Land tenure insecurity exists in Uganda because institutions that deal with land administration and land disputes have remained weak (Mwesigye et al., 2017). Land tenure insecurity is a source of conflict within families, and between groups and communities. Land conflicts render land inaccessible for production and yet land dispute resolution in the high court takes quite a long time and is costly.

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3 A parcel is in freehold if the owner has a title. Titling and leasing are still rare in Uganda because of high costs of surveying and demarcation that are involved in obtaining a land title.

Given that land tenure security is of high relevance to the policy debate and land fragmentation is increasingly high, our study seeks to answer the following research questions, among others:

1. Is crop choice (between annual and perennial commercial crops) influenced by land tenure security and land fragmentation?
2. Is the production intensity of adopting commercial crops (proportion of land allocated to a specific crop category) affected by land tenure security and land fragmentation?

## Objectives of the study

The overarching objective of this study is to examine whether land tenure security and fragmentation impact on agricultural commercialization through crop choice in Uganda.

We use the two key indicators of land rights and tenure security to derive our hypotheses. These are de jure land rights which are derived from the ownership of formal land titles, and de facto land rights which are derived from community specific norms and practices regarding land use, land rights and tenure security. These informal arrangements shape individuals' perceptions about the form of rights they possess over the land they occupy such as land transfer rights (see Bellemare, 2013; Besley, 1995). The study empirically tests the following null hypotheses:

- a) Land titling has no differential effect on the choice between perennial commercial and other crop types, and on the production intensity.
- b) There is no differential effect of perceived land transfer rights on the choice between perennial commercial and other crop types, and on the production intensity.
- c) Land fragmentation has no differential effect on the choice and production intensity between perennial commercial and other crop types.

## Data source

This study utilizes household, parcel and plot-level data collected as part of the Research on Poverty, Environment and Agricultural Technology (RePEAT) surveys from rural Uganda from 2003 to 2015. The sample for the RePEAT survey builds upon a research project on policies for improved land management in Uganda, conducted

by the International Food Policy Research Institute (IFPRI) and Makerere University from 1999 to 2001 (Pender et al., 2004). The latter involved a survey of 107 villages selected from two-thirds of the regions in Uganda, including the more densely populated areas and areas that were free from wars in the southwest, central, east and parts of northern Uganda and representing seven of the nine major farming systems of the country. Because of insecurity in the north and northeastern parts of the country, villages in this region were excluded from the surveyed samples. Within the study region, villages (the lowest administrative units) were selected using a stratified random sample, with the stratification based on development domains defined by the different agro-ecological and market access zones, and differences in population density.

The RePEAT survey covers 94 villages which are the smallest administrative units in Uganda.<sup>4</sup> From each village, ten households were randomly selected to make a total of 940 sample households (Yamano et al., 2004). The RePEAT surveys were jointly conducted by Makerere University, the Foundation for Advanced Studies on International Development (FASID), and the National Graduate Institute for Policy Studies (GRIPS) in 2003, 2005 and 2009, and by Makerere University and GRIPS in 2012/2013 and 2015.

RePEAT surveys captured information on household characteristics, land tenure and tenancy arrangements, land titling and documentation, different forms of land use and land transfer rights, crops produced and land allocation to each crop. The survey was extended to northern and north eastern Uganda in 2015, and therefore the latest survey phase covered all regions of Uganda.

RePEAT panel surveys have suffered from attrition over the years. The sample in 2003 was 940 households, the sample reduced to 936 households in 2005 and, hence, the attrition rate was 0.4%. In 2012, the panel sample size reduced to 778 households resulting into the attrition rate of 17%. In 2015, the original panel sample reduced further to 609, and the attrition rate raised to 35%. In 2012 and 2015, the households that could not be traced were randomly replaced by their previously neighboring households. In addition, the 2015 survey expanded the scope to include the northern region. This study utilizes the 2003 and 2012 data because it captured the land rights and tenure security variables which are key for our analysis. The focus of the analysis is land tenure security, land fragmentation and crop choice. Accordingly, information on land tenure systems, tenancy arrangements, titling and transfer rights form a core of this study. However, 2005 panel round missed information on land tenure systems and as a result, we drop this data set.

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4 We use village to mean Local Council 1, the lowest administrative unit in Uganda.

## Conclusion and policy recommendations

This study examines the effect of land tenure security and land fragmentation on crop choice and production intensity in Uganda using household, parcel, and plot-level data for 2003 and 2012. We use formal land titling as a proxy for de jure land rights, and land transfer rights as an indicator of informal or de facto land rights, and these two measures indicate land tenure security. The two-part model estimates showed that having a title significantly increases the likelihood of growing perennial commercial crops, and the land allocated to production of perennial commercial crops. However, the findings show that there is a less likelihood of growing annual crops on the titled parcels, suggesting that when farmers have land rights, they substitute annual crops with perennial commercial crops. The results show no effect of land titling on the land allocated to annual crops and trees. When land titling is interacted with the distance to parcel, the results show that farmers grow more commercial crops and less annual crops on the titled parcels even when the distance increases. In addition, the results show no effect of distance on the amount of land allocated to commercial and annual crops when parcels are titled.

Consistent with the results on de jure land rights, the results also show that transfer rights (both with and without approval) increase the likelihood of growing perennial commercial crops and the size of land allocated to perennial commercial crops. The transfer rights weakly impact on the production of annual crops and trees as they have no effect on the land allocated to these crops.

Regarding land fragmentation, the results reveal that Simpson Index is negatively and significantly associated with low likelihood of growing commercial crops and a reduction in the land allocated to perennial commercial crops. The Simpson Index, however, is positively associated with the likelihood of growing annual crops but negatively associated with the land allocated to annual crops. We do not find any impact of Simpson Index on the land allocated for trees. These results suggest that land fragmentation affects more the production of perennial commercial crops than it does for other crops.

These results have key policy implications. First, they suggest that land tenure security affects more the production of commercial crops, which need significant investment than they do for annual crops and trees. Therefore, to promote the production of commercial crops, there is a need for policies and strategies that enhance tenure security through titling and registration, and other interventions to privatize land rights. Secondly, the results show that both formal (tilting) and informal (de facto) land rights enhance the choice of, and land allocated to, perennial commercial crops. This means that simple and less costly interventions that improve farmers land rights and security perceptions would go a long way in promoting the production of commercial



crops. The Government of Uganda has implemented similar interventions through the 1998 Land Act that prohibits displacement of tenants and bona fide occupants on Mailo land without compensation. Similar interventions can be implemented on customary land to enhance transfer rights.

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