



The Mitigating Impact of Land Tenure Security on Drought-Induced Food Insecurity: Evidence from Rural Malawi

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July 2021 / No.741

Abstract

This paper investigates the interaction between land tenure security and food security in agriculture-dependent households. We explore household variation in land tenure security and drought shocks across villages to investigate the extent to which land tenure systems affect the capacity of agricultural households in Malawi to cope with adverse impacts of weather shocks. Our findings reveal that land tenure security cushions the effect of drought regimes on food security. Further, we establish irrigation practice as the underlying channel that mediates the impact of drought shocks on food insecurity. The results of this study reinforce the growing consensus that property rights through land tenure security are associated with agricultural productivity and, consequently, household food security.

Introduction

Promoting agricultural productivity to ensure food security has been a major public policy issue in developing countries in recent years. Despite the enormous efforts by the governments, both national and international, evidence shows that the number of chronically undernourished people worldwide increased from about 804 million in 2016 to almost 821 million in 2017. And the prevalence of food insecurity is higher in Africa than in other regions in the world. About 256 million people in Africa, accounting for 21% of the population suffering chronic food deprivation in 2017 and for a significant proportion of global food insecurity cases (FAO et al. 2018). Since 1990–1992, about 42 million were added to the total number of undernourished people in sub-Saharan Africa with an estimated 217.8 million in 2014–2016 compared to 176 million in 1990–1992 (FAO, 2015). These dynamics are driven by the poverty statistics associated with this region compared to the rest of the world¹.

Many poor households in sub-Saharan Africa depend on smallholder agricultural practice for their livelihoods. Given this background, sustainable food security for most poor households in the region is often linked to enhanced productivity and growth of the agriculture sector. However, the sustainable agricultural productivity of these households is hampered by the variability of weather and climate. The bottom of the pyramid of agrarian households is the worst hit by this (Asfaw and von Braun, 2004; Fussel, 2010; Ericksen et al., 2011; Skoufias et al., 2011; Levine and Yang, 2014; Asfaw and Maggio, 2017)².

Besides climate and weather variability, land tenure insecurity has been a limiting factor in agricultural productivity and food security among agrarian households. When land rights are insecure, the motivation to invest in the land could be low. This can also lead to entitlement failure, in which farmers fail to make long-term plans or invest in crops with high yields on farmlands. These behaviours can have consequences, leading to a decrease in agricultural productivity and food insecurity (Besley, 1995; Potts, 2006; Woodhouse, 2006; Deininger et al. 2009; Bhaumik et al., 2016; Linkow, 2016; Lovo, 2016).

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- 1 As of 2012, the share of people living on US\$1.90 or less a day was 47% (501 million people) of the population of sub-Saharan Africa. This resulted in 233 million undernourished people in sub-Saharan Africa within the same period (World Bank, 2017). s
 - 2 Recent evidence shows that climate and weather variability have deleterious effects on household welfare through crop failures and yields variability. Therefore, climate change can potentially affect all aspects of food security through reduction in food access and utilization, and price instability (Challinor et al., 2010; IPCC, 2014).

Considering the above, this project investigated the nexus between drought regimes, land tenure security and food security in Malawi using data from a household survey. We used two waves of household data, namely the Integrated Household Surveys (IHS) of 2013 and 2016. The first motivation for focusing the research context on Malawi can be linked to an important reference from the World Bank (2010) statistics where Malawi emerged as the twelfth most exposed country to the effects of climate change. This vulnerability is likely explained by the country's historical climate distribution, which is characterized by frequent environmental shocks such as droughts and floods (Chinsinga, 2013).

Second, structural economic conditions exacerbate this vulnerability. For example, Malawi's agriculture sector contributes nearly 37% to the country's gross domestic product (GDP), with subsistence smallholders producing 75% of Malawi's total agricultural output using a production system that is predominantly rainfed with limited irrigation (Chirwa and Quinion, 2005). Moreover, according to the Global Food Security Index (GFSI), Malawi ranks 105/113 countries on overall food security index with a breakdown of 105, 101 and 106 in terms of affordability, availability, and quality/safety of food respectively (GFSI, 2016). These features typically explain why micro and macro food security indices in Malawi may be highly elastic to rainfall shocks, especially droughts. This situation leaves Malawi highly susceptible to chronic food insecurity (Harrigan, 2008).

Third, Malawi has variations in land tenure security across plots belonging to different households. Basically, the nature of the land tenure security in Malawi could be categorized as secured and unsecured land tenure. Customs and traditions determine land tenure systems through the inheritance systems in place across villages³ affecting efficient food production through agricultural practice. Patrilineal or matrilineal systems have direct effects on land ownership tenures, and these are products of customs and traditions. Also, the inheritance system in practice plays a significant role in the institution of marriage across communities thereby determining the expected traditional union for couples – patrilocal or matrilocal. Hence, the customary gender-biased inheritance practices prevalent in the community could affect the extent of land tenure security (Peters and Kambewa, 2007; Peters, 2010; Lovo, 2016; Berge et al. 2014)⁴.

The objectives of this study were twofold: first, to investigate the mitigating role of land tenure security in the relationship between droughts and household food

3 Takane (2008) documents that approximately 70% of Malawi land ownership is determined through the customary land tenure system.

4 Land tenure refers to 'the relationships between individuals and groups of individuals by which rights and obligations are defined with respect to control and use of land' (Bruce, 1986; Moyo, 1995; Shivji et al., 1998).

security in Malawi⁵. This stems from the evidence that considers land tenure security as associated with food security (Besley and Burgess, 2000; Deininger et al., 2009; Ghebru and Holden, 2013; Mendola and Simtowe, 2015). Second, to investigate whether the mitigating role of land tenure security on the impacts of drought on food security differs between matrilineal and patrilineal societies.

Accordingly, this study addressed the following research questions: Do droughts have impacts on household food security in Malawi? If so, are households with land tenure security less vulnerable to the impacts of rainfall shocks than insecure land tenure holders? For example, households with land tenure security could have more investment on the land that mitigates the impact of rainfall shocks on food security. Are there differences in mitigating impact of land tenure security between matrilineal and patrilineal societies? This research is based on the following hypotheses: (1) drought affects household food security; (2) households with land tenure security are less affected by drought; and (3) patrilineal societies with land tenure security are less affected by the impact of droughts on food security relative to matrilineal societies.

The paper contributes to the growing literature on the impact of rainfall shocks on household welfare (Jayachandran, 2006; Yang and Choi, 2007; Björkman-Nyqvist, 2013; Levine and Yang, 2014; Asfaw and Maggio, 2017) by considering the role of land tenure security in mitigating against drought shocks for rural households. The paper's novel approach in examining the mitigating role of land tenure security in the relationship between drought and household food security distinguishes it from the existing literature.

Land tenure system in Malawi: A background

The evolution of the customary land tenure system in Malawi is strongly linked to lineage systems across communities. Dating back to 1965, the Land Act in Malawi defines land ownership under three major categories, namely private, public, and customary tenures (Kishindo, 2004). The public land ownership category is the most reliable followed by customary and private, respectively. Weakness in private ownership is attributed to possibility of withdrawal of freehold/leasehold title or Certificate of Claim by the minister responsible for land matter. The customary land ownership category dominates in the rural areas where land distribution is delegated to chiefs and village heads by the minister. Whilst customary land is the legal property

5 Food security is commonly defined as prevailing 'when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life' (FAO, 2014a).

of Malawi (Nankumba and Machika, 1988), such land is usually operated under the customary law of each community. Therefore, the distribution of customary land to villagers is basically guided by cultural, socio-economic, and demographic conditions of each locality. Hence, the variation in the sociocultural backgrounds in Malawi causes differences in the management and allocation of customary land across communities. In addition to a general perception that land is a gift from God for subsistence, it belongs to lineages. These are a strong force in determining availability, access, and control of customary land across communities.

Lands allocated to household units by chiefs and village heads are premised on user rights which can be terminated at any time. Also, chiefs only exercise trusteeship and are accountable to the community for due diligence – to ensure its tradition is preserved. In essence, the only sustaining factor for acquisition and distribution of land in rural Malawi is the lineage institution. The institution in this regard comprises kinship, descent tracing and inheritance systems which vary substantially across Malawi communities. The northern region of Malawi predominantly practices a patrilineal sociocultural system giving men primary rights and control over land while in the central and southern regions, which are predominantly matrilineal, these rights belong to women (Kishindo, 2004)⁶.

Marriage and residence are other bases for acquiring land use rights. This creates an additional basis for patrilocal or matrilineal practices across Malawi. Matchaya (2009) reviews residential factors determining access and security index of customary land tenures in Malawi. Results reveal that non-indigenous groups are associated with a higher likelihood of land tenure insecurity than other categories (indigenous, weakly indigenous and indigenous). This finding is consistent with the submission of Kishindo (2004) who explains that non-indigenous residents are considered eligible for land use rights only after being accepted as members of their host community.

Lovo (2016) has shown that the gender-biased inheritance and residency system in Malawi could constitute a source of land tenure insecurity among farmers. The various systems are the matrilineal–matrilocal and the patrilineal–patrilocal systems. In a matrilineal–matrilocal system, the husband moves to the wife’s village and cultivates the land his wife inherited from her relatives. Conversely, in a patrilineal–patrilocal system, the wife moves to the husband’s village; he has inherited the land from his relatives so that a family is an integral part of the husband’s lineage. Divorce or death of a spouse under these two practices effectively renders the non-local partner landless and he/she returns to the village of origin without any form of compensation for the investment made in the land. Death of the landowner usually results in the land being returned to her/his relatives (Takane, 2008; Peters, 2010; Lovo, 2016).

6 Communities sharing both descent tracing categories may resolve to propensity of affiliation by community for land allocation and accessibility index.

In 2002 a new policy was instituted in Malawi witnessed that allowed farmers to register their customary land as private property. The necessary legislative amendments required to keep the policy in place were not followed and the policy ended abruptly. The question of land reform, however, continues to be a topical issue on the agenda of the government. The major concerns of the land tenure system in Malawi have since focused on land inheritance laws, and landlord–tenant relationships in the rapidly growing informal rental market (Peters, 2010).

Land policy reforms in Malawi

Post-independence, Malawi has undergone a series of land reforms to promote agricultural productivity and increase sustainable food security. Before 1996, efforts by the government failed to yield the desired outcomes at land reforms. For example, the 1967 land reform was largely unsuccessful because no major break from the past was instituted in terms mode of land ownership. Rather, it was a continuation of the colonial framework of land tenure patterns and ownership (Ng'ong'ola, 1982; Kanyongolo, 2005). The unsuccessful post-colonial land reforms and the rapid rise in population, which had severe implications on per capita landholding, led to the quest for land policy reform that could address the issues associated with perverse land inequality in Malawi.

On 18 March 1996, the central government led by the United Democratic Front (UDF) put forward a Presidential Commission of Inquiry on Land Policy Reform (PCILPR), with the mandate to promote land reform efforts in Malawi. The recommendations by the PCILPR led to the formulation of a national policy on land reform which was approved by the Cabinet in 2002⁷ (Chinsinga, 2011).

As a response to the increasing demand for arable land, the government instituted a Community-Based Rural Land Development Project (CBRLDP). It was a decentralized market-based land reform initiative introduced in 2004, and carried out in the southern region of Malawi, to ease land pressure and improve land access for needy rural households. The project was designed to address land redistribution issues that emanate from stark inequality in land distribution, and to increase agricultural productivity and the incomes of about 15, 000 poor rural families in southern Malawi (Mueller et al., 2014; Mendola and Simtowe, 2015).

Moreover, CBRLD is a market-assisted land redistribution programme based on voluntary transfers between landowners (willing-sellers) and the land-poor (willing-buyers), with government and donor agencies providing the finances and services to allow communities to buy and manage land themselves. The CBRLD was carried

7 The new land policy aimed to correct the social tension and stark inequality associated with land ownership in the country.

out in six districts, namely Machinga, Mangochi, Mulanje, Thyolo, Balaka, and Ntcheu (Mendola and Simtowe, 2015). The project was supported by the World Bank through the International Development Association (IDA), which provided US\$27 million of the total cost of US\$29.8 million.

Eligible households (landless or land-poor) were organized into 10–35 participant households and were provided with conditional cash and land transfer to relocate, purchase, develop and register new plots of farmland (Mueller et al., 2014). The total amount provided per household was US\$1,050, with up to 30% allocated to the purchase of land, 8% for relocation allowance and 62% for farm development. The programme ended in September 2011. Although it had a modicum of success in terms of land ownership and access among rural farmers in the southern region, implementation was marred by stakeholders at the community level who exploited the programme to advance their own selfish interests (Chinsinga, 2011).

Another significant agricultural policy in Malawi was the introduction of a farm input-subsidy programme. This policy was heralded several policies such as the Agriculture and Livestock Development Strategy and Action Plan (ALDSAP) established in 1995; Malawi Agricultural Sector Investment Programme (MASIP) of 1999; the Agricultural Development Programme (ADP) of 2006; the Agricultural Sector Wide Approach (ASWAP) of 2007–2009 and 2010–2015 (Ministry of Agriculture and Food Security, 2010; FAO, 2014c).

Malawi's Farm Input Subsidy Programme (FISP) is an offshoot of the Agricultural Input Subsidy Programme, a small-scale targeted input subsidy programme, also known as the Starter Pack Scheme, and it was initiated in 1998. FISP gained prominence in 2005 after the country experienced severe drought. As a result of the drought, the scope of the programme was expanded from only a few farmers to about 50% of the country's farmers, and in recent years, it covers over 70% of farmers (Harou, 2018).

The objective of FISP is to give farmers access to improved agricultural inputs which can help achieve food sufficiency and enhance rural incomes via higher levels of food and cash crop production (Dorwad and Chirwa, 2011; Lunduka et al., 2013). The programme is implemented by handing out vouchers and coupons to smallholder farmers who own their farmlands and reside legitimately in their own villages for the purchase of farm input⁸ at subsidized rates (Dorward and Chirwa, 2011; Harou, 2018). The distribution of the vouchers is done at two levels (Ricker-Gilbert and Jayne, 2017). The first level entails the allocation of fertilizer and seeds to regions and districts based on agricultural cultivation area and the number of smallholders in such location. At the second level, distribution is at community level. The community

8 These include fertilizers for maize production, improved maize seeds, pesticides, and tobacco fertilizers.

and village heads are then involved to determine the eligible smallholder. By design, the original allocation of the vouchers targets smallholders and full-time farmers who are unable to purchase at most two bags of fertilizers at the prevailing commercial price in the community of the smallholder as determined by local leaders (Dorward et al., 2013). From 2008 onward, the target group was defined as a “vulnerable” group, including resource-poor households, and disabled, elderly, female, and child-headed households (Ricker-Gilbert and Jayne, 2017).

In 2010 the government established the National Agricultural Policy Framework (NAPF), which was tasked with the responsibility of harmonizing the various agricultural development strategies and promoting agricultural productivity and realizing national food security, amongst others (FAO, 2014c).

Data sources

This study used household and plot-level data provided by the Integrated Household Panel Survey (IHPS) 2013 and the Fourth Integrated Household Survey (IHS4) 2016/2017 for Malawi⁹. These surveys were conducted by the Government of Malawi through the National Statistical Office, with the support of the World Bank. The surveys collect information on households across the entire country and provide information on various rainfall and temperature measures in the geospatial data relating to seasonal variation of weather. Other plot-specific information relating to agricultural productivity includes the topographic and vegetation indicators of household plot characteristics. The surveys collected data for 4,000 households for 2013 and for 12,447 households for 2016/2017.

To measure local rainfall shocks, we rely on rainfall data from terrestrial precipitation: the 1900–2017 gridded monthly time series (version 5.01), from the University of Delaware’s (UDel) Center for Climatic Research. The data set provides estimates of monthly precipitation on a 0.5° by 0.5° grid covering terrestrial areas across the globe for the period 1900–2014. Rainfall estimates are based on climatologically aided interpolation of available weather station information. The data have been compiled and made available by Matsuura and Willmott (2018). We use the GPS information provided for each locality referenced as enumeration area in the IHPS and IHS4 respectively for 2013 and 2016/2017 waves to access the UDel rainfall repository by matching each locality to the four closest weather stations to obtain rainfall data for the years spanning 1900 to 2017.

9 The IHS is also known as Living Standards Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA).

Conclusion and policy implications

Climate variability has been a major threat to agricultural production, food security and livelihoods of most agrarian households in developing countries. Over the years, governments—both local and international—have made efforts to design sustainable policies (directly or indirectly) to help households cope or mitigate the pernicious impacts of weather shocks. In view of this, our study extends the existing literature by evaluating the mitigating role of land tenure security on food security in regions that depend on agriculture. Specifically, we explore variations in land tenure security and drought regimes across villages to investigate the extent to which the land tenure system matters in household capacity to cope with negative consequences of climate shocks for rural agricultural dependent households in Malawi.

Our findings reveal that drought shocks significantly affect household food security among rural households in Malawi. More importantly, we investigate the role of land tenure security across households and the capacity to cope with drought shocks. The results show a counteracting role of land tenure security on the effect of drought shocks on food security. Land tenure security arrangements in Malawi are widely diversified across legal, institutional, and customary perspectives. However, we found the strongest mitigating signals from the land titling relative to informal measures. These results are consistent with the importance of formalizing land ownership in rural areas for example through expanding legal documentation of rural lands. This finding has an important policy direction for government agencies in charge of land acquisition in Malawi. Also, we established a pathway for the mitigating effects of land tenure security as an irrigation practice. The coefficient estimates for matrilineal and patrilineal communities are distributed along outcome variables in a manner that does not suggest any differential roles of land tenure security.

The results suggest that land tenure security can have important policy implications, particularly from the perspective of safety nets. The results of this study reinforce the growing consensus that property rights through land tenure security are associated with agricultural productivity and household food security in rural areas. The most efficient way to achieve land tenure security is through formalization of land rights by issuing land titles to landowners as showcased in our study. Even though most of the land in Malawi is acquired through customary tenure systems (inheritance), the need for landowners to have formal titles will prevent land grabbing and expropriation by the government. Having formal land titles is often associated with land tenure security, which can lead to increased soil conservation practices and agricultural productivity by the landowners.

This study stresses that land reforms aimed at increasing tenure security and inclusive ownership for land users may improve productivity thereby mitigating the negative

impacts of weather shocks and enhancing household welfare among households that depend on agriculture. Therefore, land tenure security can be a policy instrument to enhance or change the welfare distribution of households, which can lead to a reduction in poverty, and promote growth and sustainable development in developing countries.

One limitation of this study is the non-randomness of land tenure security across households in rural Malawi. Although there is evidence supporting the claim, we made in this paper that land acquisitions in rural Malawi are mostly through inheritance, this mode of acquisition is, to some extent, an exogenous source of land tenure security. Future research could consider a more plausibly exogenous source of land tenure security such as land titling that provides a clear treatment and control groups in an experimental setting. This sort of study will provide a more causal claim or argument for the mitigating impact of land tenure security than this current paper.

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Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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