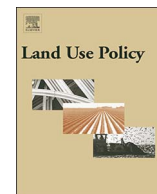




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Land access, land rental and food security: Evidence from Kenya

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ABSTRACT

Land scarcity is increasingly recognized as a problem impeding rural household welfare in densely populated areas of Africa. This study utilizes household- and parcel-level data from rural Kenya to explore the linkage between land access and food security. Renting land is found to be the main approach used by rural households in a given year to access additional land for cultivation. However, our econometric results show that land rental markets do not allow farmers to fully adjust their operated land size to desired levels. Furthermore, parcel-level analysis shows that indicators of land productivity and investment are lower on rented parcels than on own parcels. These findings indicate that land rental markets in Kenya do not enable land to be reallocated in ways that would fully contribute to national food security and poverty reduction goals. A 100% increase in rented land – which amounts to 1.04 acres for the median renter – would increase household food consumption per adult equivalent by 9%, cereal consumption per adult equivalent by 14%, and home-produced food consumption per adult equivalent by 11%. Even with imperfections in land rental markets, renting-in land still contributes to food security among rural households in Kenya.

1. Introduction

Food insecurity and malnutrition are persistent worldwide problems. More than 1.4 billion people lived on less than \$1.25 a day, the international poverty line in 2005 (Chen and Ravallion, 2008). According to FAO (2010), 925 million people suffered from food insecurity in 2010.¹ Sub-Saharan Africa (SSA) has the highest incidence of under-nourishment of all regions of the world; roughly 30% of SSA's population suffers from chronic hunger.

These problems of food insecurity are likely to be exacerbated in densely populated and poverty-stricken areas of Africa where the arable land frontier has been exhausted, and where farm sizes are small and declining due to increased population pressures and sluggish structural transformation processes (Jayne et al., 2014). In such settings, many land-constrained rural households rely on land markets to gain access to land (Teklu and Lemi, 2004; Benin and Pender, 2008; Ghebru and Holden, 2008; Holden et al., 2008; Lunduka et al., 2008; Yamano et al., 2008; Deininger and Mpuga, 2009; Jin and Jayne, 2013). Many studies have addressed the determinants of land rental market participation in numerous countries. However, the relationship between rental market

participation and households' food security status has not been explored in the literature and remains poorly understood. This study is motivated by the need to more accurately understand the potential of land rental markets to improve rural households' access to land and their food security status.

We begin to fill this knowledge gap by addressing three related issues. First, we investigate the extent to which households are able to access the desired amount of operational land size² through land rental markets. Second, we use parcel-level data from households that cultivate both owned and rented parcels to compare potential differences in land productivity and input use intensity. Third, we rely on the panel household data to measure the specific contributions of additional rented and owned land to various indicators of household food consumption and income. The analysis is based on panel survey data covering 713 rural households in 2004 and 2007.

Our analysis highlights three main findings. First, major concerns are warranted regarding the performance of land rental markets in Kenya. While our data show that rented land accounts for roughly 40% of total operated area among households that rent land, and that these numbers are growing over time, land rental markets do not enable

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E-mail addresses: muraokarie@gmail.com (R. Muraoka), sjin@zju.edu.cn, jins@msu.edu (S. Jin), jayne@msu.edu (T.S. Jayne).¹ According to FAO, food security is defined as having physical and economic access to sufficient safe and nutritious food for people to meet their dietary needs and food preferences for a healthy and active life (Pinstrup-Anderson 2009).² "Desired" amount of operational land size is defined as the operational land size that would maximize the value of output per unit of land given the level of the household's labor and other resources, following Skoufias (1995).<http://dx.doi.org/10.1016/j.landusepol.2017.10.045>Received 13 January 2017; Received in revised form 23 October 2017; Accepted 25 October 2017
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farmers to achieve their desired amount of operated farm size. The results indicate that tenants rented in between 67% and 72% of the amount of land that would maximize the value of output per unit of land, given their other resource constraints. Landlords rented out less than half the amount of land that would have maximized their value of output per unit land. Second, we find that land productivity of rented parcels is significantly lower than owned parcels, and farmers apply significantly less organic fertilizer to rented land than to own land. Third, regardless of these limitations of land rental market in Kenta, we still find that households participating in land rental markets are able to improve their food security status. A doubling of operated rented-in land, which is roughly an additional one acre of land for the median household that rents land, would increase household total food consumption per adult equivalent, cereal consumption per adult equivalent, and home produced food consumption per adult equivalent by 9%, 14%, and 11%, respectively.

The organization of this paper is as follows. Section 2 reviews the literature on the performance of land rental markets in developing areas and in Kenya. Section 3 presents our estimation strategy. The data used in this research is discussed in Section 4, followed by descriptive statistics. Section 5 discusses estimation results. Finally, Section 6 summarizes the major findings and draws policy implications.

2. Background

2.1. Evidence on land rental and sale markets

In Asia, land rental markets have been actively studied for decades. Land rental markets have historically been very thin in most of Africa, but this has changed rapidly over the past decade (Holden et al., 2008). A few highly consistent and important findings have emerged from the large number of studies covering a large number of countries. First, with few exceptions, land rental markets have been found to be a major way -- if not the only way -- for enabling land-poor households to access land (see Jin and Deininger, 2009 and Kimura et al., 2011 for evidence on China; Deininger and Jin, 2008 on Vietnam; Deininger et al., 2008 on India; Deininger et al., 2011, and Gebregziabher and Holden, 2011 on Ethiopia; Migot-Adholla et al., 1994 on Ghana; Holden et al., 2006 on Malawi; Yamano et al., 2008, and Jin and Jayne, 2013 on Kenya; André and Platteau, 1998 on Rwanda; Deininger and Mpuga, 2009 on Uganda; and Chamberlin and Ricker-Gilbert, 2016, on Malawi and Zambia). Second, land rental markets are generally found to enhance farm productivity (Jin and Deininger, 2009; Deininger and Jin, 2008, Deininger et al., 2008; Deininger and Mpuga, 2009; Jin and Jayne, 2013; Chamberlin and Ricker-Gilbert, 2016). Third, many studies identified the presence of significant transaction costs associated with participating in land rental markets, which typically prevent farmers from fully adjusting their operated land size to desired levels (Skoufias, 1995; Deininger and Jin 2005; Yamano et al., 2008; Kimura et al., 2011; Chamberlin and Ricker-Gilbert 2016).

Compared to land sale markets, land rental markets in developing countries tend to attract more attention from policy makers and researchers (Holden et al., 2008; Deininger, 2003). Besides the fact that land sale markets are banned in some developing countries (e.g., China, Mozambique, etc.), there are several reasons why land rental markets may be more effective for enabling poor rural households to access land than sales market. First, land purchases require a much greater up-front payment than renting land. Hence, land rental markets are more accessible for farmers, especially poor farmers facing credits constraints (Hayami and Otsuka, 1993). Second, rental payment sometime can be paid after harvest, which makes renting land by poor farmers possible (Jin and Deininger, 2009). Third, rental markets are more flexible in terms of duration. Finally, rental markets are less risky than sales markets. Distress sale is an example of how farmers may sell land at a heavy discounted price to cope with emergency conditions, and they ended up losing the land forever (Rawal, 2001; Baland et al., 2007).

These considerations partially explain why land sales markets are generally much less active than rental markets in Africa (Holden et al., 2008). For the same reasons, rental markets are widely promoted by the Government of Kenya (Government of Kenya, 2007, paras 162 and 163) and many other developing countries (Deininger, 2003).

2.2. Land rental markets in Kenya

Rural households' participation in rental markets in Kenya appears to be rising. Less than 10% of rural households rented land in several districts in Kenya in the late 1990s (Wangila, 1999). However, Yamano et al. (2008) find that 17.9% households rented land in 15 districts in Kenya in 2004. Jin and Jayne (2013) show that the proportion of households renting in land increased from 18% to 20% from 1997 to 2007 in 24 districts in Kenya. The data used in this study showed that 22.3% of households rented in land in 2007 in Kenya. This 2007 data is a panel of the 2004 data used by Yamano et al. (2008) in their analysis. This suggests that the proportion of households renting in land increased by 5% in 3 years. Almost all land rental contracts are in the form of fixed-rent contact and there are very few sharecropping contracts in Kenya (Yamano et al., 2008).

The Government of Kenya's National Land Policy (2007) states that "the potential to provide access to land to those who are productive but own little or no land" and also says that government should "encourage the development of land rental markets while protecting the rights of smallholders by providing better information about transactions to enhance their bargaining power" (Government of Kenya, 2007, paras 162 and 163). Given the fact that the Kenyan government takes a positive stance to promote land rental markets and that a significant proportion of Kenya farmers are participating in land rental markets, it is important to understand how well the current land rental markets are functioning in terms of allowing farmers to access additional land for agriculture and the ensuing effects on household income and food security.

2.3. Land access and food security

In developing countries where the off-farm employment opportunities are limited, a rural household's ability to own or access land is directly related to its ability to produce food and generate income. The two common channels that land access affects food security are (1) purchase power and (2) food availability. There is considerable evidence that operated land size and ability to access land are positively correlated with income and/or welfare of rural households in regions that have remained primarily agrarian (Tschirley and Weber, 1994; Jayne et al., 2003; Mather et al., 2012; Jin and Jayne, 2013; Chamberlin and Ricker-Gilbert, 2016). Another argument linking land access to food security is related to the aspect of food availability. Burgess (2001) argues that under imperfect food markets, land can serve as a source of cheaper food relative to market-purchased food. Pinstrup-Andersen (1993) emphasizes the linkage between production and consumption in addressing nutrition and food security strategies in developing countries.

Maxwell and Wiebe (1999) and Holden and Ghebru (2016) provide comprehensive reviews of the literature examining the relationship between access to land and access to food in an agrarian economy (Drèze and Sen, 1989; Shipton, 1990; Barraclough, 1991; and Rahmato, 1993; Holden et al., 2008). A growing body of evidence, from a variety of settings around the world, illustrates the positive correlation between land rights, land access, and food security and nutrition.³ A descriptive study of a land purchase program from the Indian state of Andhra

³ However, there are some exceptions. For example, a study of the land redistribution reform in South Africa found that reform beneficiaries are more food insecure than non-beneficiaries, and this finding controls for omitted unobservables (Valente, 2009).

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