

## Africa's changing farm size distribution patterns: the rise of medium-scale farms

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### Abstract

This study assesses changes over the past decade in the farm size distributions of Ghana, Kenya, Tanzania, and Zambia, drawing on two or more waves of nationally representative population-based and/or area-based surveys. Analysis indicates that much of Sub-Saharan Africa is experiencing major changes in farm land ownership patterns. Among all farms below 100 hectares in size, the share of land on small-scale holdings under five hectares has declined except in Kenya. Medium-scale farms (defined here as farm holdings between 5 and 100 hectares) account for a rising share of total farmland, especially in the 10–100 hectare range where the number of these farms is growing especially rapidly. Medium-scale farms control roughly 20% of total farmland in Kenya, 32% in Ghana, 39% in Tanzania, and over 50% in Zambia. The numbers of such farms are also growing very rapidly, except in Kenya. We also conducted detailed life history surveys of medium-scale farmers in each of these four countries and found that the rapid rise of medium-scale holdings in most cases reflects increased interest in land by urban-based professionals or influential rural people. About half of these farmers obtained their land later in life, financed by nonfarm income. The rise of medium-scale farms is affecting the region in diverse ways that are difficult to generalize. Many such farms are a source of dynamism, technical change, and commercialization of African agriculture. However, medium-scale land acquisitions may exacerbate land scarcity in rural areas and constrain the rate of growth in the number of small-scale farm holdings. Medium-scale farmers tend to dominate farm lobby groups and influence agricultural policies and public expenditures to agriculture in their favor. Nationally representative Demographic and Health Survey (DHS) data from six countries (Ghana, Kenya, Malawi, Rwanda, Tanzania, and Zambia) show that urban households own 5–35% of total agricultural land and that this share is rising in all countries where DHS surveys were repeated. This suggests a new and hitherto unrecognized channel by which medium-scale farmers may be altering the strength and location of agricultural growth and employment multipliers between rural and urban areas. Given current trends, medium-scale farms are likely to soon become the dominant scale of farming in many African countries.

*JEL classifications:* Q15, O13, O55, D30

*Keywords:* land; Africa; farm size distribution; medium-scale farms; land acquisitions; agricultural transformation

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### 1. Introduction

Recent global policy attention to “land grabs” by international investors, while of great consequence, has arguably diverted attention from another development that may be more fundamentally affecting Africa's economic development tra-

jectory: the pace of land acquisitions by medium-scale farmers. Land acquisitions by this group are part and parcel of changing perceptions within African governments about how agricultural development should unfold in their countries, and they appear to be changing the nature of political support for African agriculture.

Rising rural population densities across sub-Saharan Africa, coupled with rural populations that retain family farms regardless of their primary source of employment, suggest an

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evolution toward smaller farm sizes across the region (Jayne et al., 2003; Masters et al., 2013). The fact that most farms in the region are becoming smaller is therefore not surprising. Rather more surprising are the indications of important changes in farm structure associated with rapid expansion in the number of medium-scale farms, defined here as farm holdings between 5 and 100 hectares, many of whom live in urban areas (Jayne et al. 2014; Sitko and Jayne, 2014).<sup>1</sup> We contend that most analyses of African agriculture using population-based surveys may mask potentially major changes in farm size distributions. We do not know precisely how pervasive these changes in farm size distribution are, much less do we fully understand their effects on the broader development processes playing out in the region. Nonetheless, on the basis of the evidence presented in this study, we can start to trace out some initial trends and patterns.

This study uses available data to estimate the percentage of farmland under small-, medium-, and large-scale holdings in Ghana, Kenya, Tanzania, and Zambia. In Tanzania's case, we are able to compare farm size distributions according to population-based survey data and census data in the same year. We then assess trends in the growth in numbers of farms in various size categories over time as well as shifts in their shares of total agricultural land. We also review evidence on the characteristics and origins of the growing class of medium-scale farmers based on unique surveys of these households in Ghana, Kenya, and Zambia. We conclude by speculating about the potential effects of changing farm size distributions in the region and propose new data collection activities to enable policy makers to better understand the policy implications of these trends.

## 2. Conceptual framework: causes of changing farm structure

Our thinking about changes in farm structure is situated within broader theoretical perspectives on development of agrarian economies, starting with the structural transformation framework (Johnston and Kilby, 1975; Johnston and Mellor, 1961; Mellor, 1976; Mellor, 2014). Stylized facts about this process are as follows: (i) the structural transformation process starts with agricultural productivity growth, at least where farming is the primary source of employment for the majority of the population; (ii) productive farmers with sufficient land to produce a surplus will lead this process; and (iii) the money that they spend from their rising surplus production stimulates demand for goods, services, and jobs in the various off-farm sectors of the economy, which induces rural–urban migration, a gradual shift in the labor force from farm to nonfarm activities, and a slowing of population growth in rural areas. Agriculture

declines in its share of gross domestic product (GDP) over time. Consolidation of farmland occurs gradually (unless associated with expropriation) as the more efficient farmers rent or buy land from their less efficient neighbors, who exit farming or reduce the share of their labor time devoted to it. Labor productivity rises as labor migrates from less productive agriculture to more productive manufacturing and service sectors (intersectoral gains) and through productivity growth within agriculture (intra-sectoral gains), which is generally driven by technological innovation, scale economies, shifts to higher-return crops and animal products associated with urbanization and improving market access conditions, and the exit of less productive laborers from farming.

Recent African cross-country data suggest that at least some aspects of this process are well underway. Table 1 reports shifts over time in the composition of the labor force in nine African countries based on population-based national surveys or censuses. Two indicators of job composition were computed: the total number of jobs recorded by sector, based on the recognition that most African adults have multiple jobs, and the full-time equivalent method that allocates individuals' work time to particular activities. According to both indicators, there has been a widespread but highly variable, and in some cases quite rapid, shift of the labor force out of farming in recent years (see also McMillan et al., 2014).

Since Lewis (1954), it has generally been understood that agriculture would continue to be the reserve labor pool for the work force until dynamism in the nonfarm sector pulled labor out of farming. African countries' recent growth in nonfarm sectors and shift in the labor force out of farming, as indicated in Table 1, might be expected to gradually contribute to land consolidation and rising farm sizes. Urbanization and higher urban incomes would increase the demand for food and for property, and hence for land. Rising land prices induce more intensive and commercialized patterns of land use close to cities (von Thünen, 1826), with the scale of farming being commodity specific. Labor-intensive vegetable and fruit production could remain small scale while economies of scale in grains and oilseed production would induce larger-scale operations. Meanwhile, the hinterlands remain semisubsistence and small-scale until the spread of urbanization and market connectivity eventually pulls them into similar commercialization processes (Masters et al., 2013; Reardon, 2015).

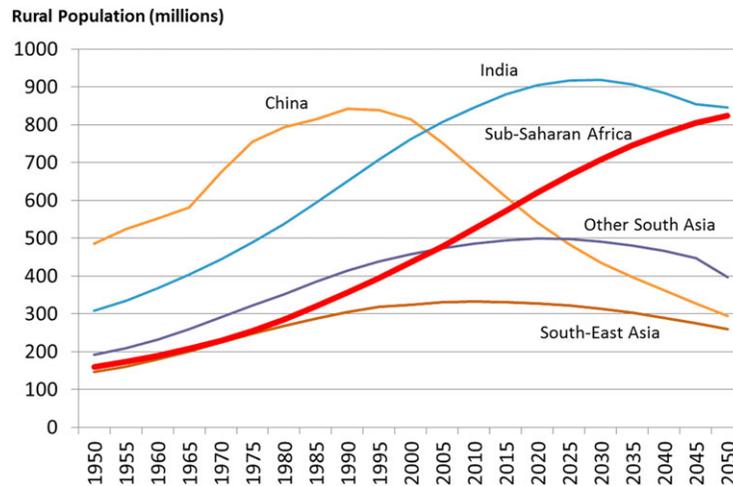
The stylized Asian structural transformation process described above has for decades provided a framework for anticipating the development process that would similarly unfold in much of sub-Saharan Africa. Similar to Asia, Africa was perceived to have a predominantly “unimodal” smallholder farming system (with a few exceptions such as South Africa and Zimbabwe) and therefore the Asian experience has generally been considered more relevant for Africa than Latin America with its “bimodal” and highly concentrated farm structure. However, some aspects of the economic transformations now underway in Africa show significant divergences from the stylized Asian transformations.

<sup>1</sup> The terms “medium” and “large” scale are inherently arbitrary and connote different scales of farming in different regions of the world, but for the purposes of our article, we will refer to small-, medium-, and large-scale farms as those between 0–5, 5–100, and over 100 hectares of operated land, respectively. A number of African governments also use 5 hectares as the distinction between small- and medium-scale holdings.

Table 1  
Changes in the share of total jobs among the working-age population (15–64 years) in farming, off-farm jobs within agri-food systems (AFS), and in nonfarm jobs (non-AFS)

Country	Survey years	Total # of jobs in millions	Off-farm within AFS										Nonfarm outside AFS	
			Farming		Agro-processing		Downstream commerce and distribution		Farming		Agro-processing		Nonfarm outside AFS	
			% of jobs	% of FTE jobs	% of jobs	% of FTE jobs	% of jobs	% of FTE jobs	% of jobs	% of FTE jobs	% of jobs	% of FTE jobs	% of jobs	% of FTE jobs
Ghana	2005/06	10.1	52.1	43.5	7.5	6.3	7.1	8.6	33.3	41.6				
	2012/13	13.9	43.6	34.3	3.7	3.7	13.8	15.5	38.9	46.5				
Nigeria	2010/11	62.3	37.0	30.6	2.6	2.3	16.1	18.7	44.4	48.2				
	2012/13	69.7	42.1	33.7	4.8	4.6	16.2	18.6	36.9	43.1				
Rwanda	2005/06	6.1	75.2	65.7	0.4	0.4	6.5	7.4	18.0	26.6				
	2010/11	9.1	67.4	54.0	1.1	1.2	5.7	7.7	25.9	37.0				
Tanzania	2010/11	18.4	59.0	47.3	1.7	2.5	12.5	15.0	26.8	35.2				
	2012/13	20.4	58.7	48.3	1.5	1.6	12.5	15.6	27.3	34.5				
Uganda	2005/06	10.8	72.6	57.0	2.1	2.8	5.7	10.2	19.6	30.0				
	2011/12	15.9	67.1	48.6	2.8	1.7	6.6	12.0	23.5	37.7				
Zambia	2005	4.7	73.8	61.2	1.2	1.6	1.9	3.1	23.1	34.1				
	2012	5.3	60.4	46.7	1.6	2.1	4.9	7.1	33.2	44.1				
Kenya~	1999	11.1	54.4	-	-	-	45.6	-	-	-				
	2009	14.2	45.6	-	-	-	54.4	-	-	-				
Malawi~	1998	1.9	73.3	-	-	-	26.7	-	-	-				
	2008	2.0	53.9	-	-	-	46.1	-	-	-				
Mali~	1998	2.0	79.6	-	-	-	20.4	-	-	-				
	2009	2.6	64.2	-	-	-	35.8	-	-	-				

Notes: FTE, full-time equivalent employment. ~The census data used to compute results for Kenya, Malawi, and Mali did not permit disaggregation of off-farm jobs into various categories. Agri-food systems jobs reported above include those in input supply, extension, trading of agricultural products, processing, preparation of foods away from home, etc. For details, see Yeboah and Jayne (2016). Source: Yeboah and Jayne (2016), computed from Ghana Living Standard Survey; Zambia labor force surveys; Rwanda Integrated Household Living Survey; Tanzania National Panel Survey; Uganda National Panel Survey; Nigeria General Household surveys. ~Kenya, Malawi, and Mali results are from population and housing census data in Integrated Public Use Microdata Series (IPUMS: <https://www.ipums.org/>).



Source: United Nations, 2014.

Fig. 1. Rural population trends (millions) in sub-Saharan Africa and other developing areas.

First, rural populations continue to grow even as most African countries are urbanizing. Sub-Saharan Africa is the only region of the world that is continuing to experience rural population growth. Rural Africa is projected to have roughly 60% more people in 2050 than in 2015 (Fig. 1). Similarly, Green Revolution Asia and most other agricultural growth successes have occurred with steadily rising absolute numbers of rural and agricultural populations for extended periods of time, with Asia's rural population only having begun to decline very recently (Bezemer and Hazell, 2006; Lipton, 2009, p. 100). Farmland consolidation in most Asian countries has started to occur only very recently, if at all.<sup>2</sup> Hence, the Asian experience might suggest that Africa should also experience a very slow rate of farmland consolidation.

However, many parts of Africa are experiencing major shifts in the balance of power over land allocation and resulting change in land institutions. Customary tenure systems in sub-Saharan Africa were generally designed to hold land in reserve for current and future generations of local people. Yet recent studies point to a widespread breakdown of these traditional norms.<sup>3</sup> Customary tenure systems have already been abolished in some countries as the modern state has exerted its authority over all land in the country. In other cases where customary tenure systems still exist, local and foreign interests have successfully negotiated with traditional authorities for land, much of which is subsequently converted by the recipient to privately titled land. These types of land acquisitions can, over time, influence farm size distribution patterns. Sitko and Chamberlin (2016) report that the share of Zambia's land under customary tenure has declined from 94% at independence to at most 54%

in 2015. The share of Malawi's land under customary tenure has similarly declined from 87% at independence to an estimated 60% today (Anseeuw et al., 2016). To the extent that willingness to pay modes of land acquisition have become increasingly common in customary tenure areas, then even in spite of continued rural population growth, we might expect to see the scale and structure of farmland ownership changing much earlier and more rapidly in African structural transformation processes than was witnessed in Asia (Woodhouse, 2003). Moreover, to the extent that the new farms being created as a result of these processes are relatively few in number (in relation to the total population of farm households in a given country), these acquisitions could be changing countries' farm size distributions in ways not well measured in population-based surveys such as the Living Standards Monitoring Surveys (LSMS).

A second stylized fact of Asian structural transformation models that may not generally apply to Africa is that of a unidirectional flow of labor from farm to off-farm sectors of the economy, i.e., that once people find their way into gainful nonfarm employment, they are unlikely to return to farming. This perspective does not account for the possibility that under certain conditions, some groups that are urban-based and engaged primarily in nonfarm jobs may have incentives to invest in farming and may be in a relatively advantageous position to do so after having overcome constraints related to access to capital, management expertise, social *entrée*, and ability to navigate complex traditional and/or statutory land institutions to acquire land—constraints that generally limit the ability of the vast majority of rural-based farmers to compete for quality land in both customary and statutory tenure systems. We might expect that a relatively small segment of the urban population—those who have accumulated substantial wealth, are well educated, and have become close to the sources of power in the capital cities—may have unique advantages to exploit profit

<sup>2</sup> See Lipton (2009), Bezemer and Hazell (2006), Huang and Ding (2015), Masters et al. (2013), and Lowder et al. (2016).

<sup>3</sup> For rich evidence on this point, see Woodhouse (2003), Colin and Woodhouse (2010), Boone (2014), and Edelman et al. (2015).

opportunities associated with land acquisition (which may include investment in farming, although not necessarily so).<sup>4</sup>

Political economy models may also help us anticipate future trajectories of farmland distribution in parts of Africa. Because of the tendency for politically influential groups to succeed over time in altering government distribution systems to their interests (López, 2005), it may be expected that they would seek to create and utilize state apparatuses to acquire land once the returns to capital in farming or other land-based activities start to become attractive, e.g., in response to urbanization and/or the recent period of high global food prices. Rising land scarcity might ignite efforts by the state to wrest control of land from local chiefs where significant unutilized land is still under customary tenure systems. Where customary tenure systems have already been abolished, as in much of Zimbabwe and Kenya, we might expect to see efforts by wealthy and influential people to seek preferential and low-cost access to government-controlled statutory land (Herbst, 2000). State-supported large farm initiatives have arisen in numerous African countries, such as Block Farm schemes in Zambia and Ghana and public/private farm investments in Ethiopia (Ali et al., 2015). Government Land Bills to support entrepreneurial “emergent” farmers appear poised to facilitate the conversion of arable land from customary to statutory tenure systems where it can then be allocated at submarket prices to serve patronage objectives in addition to agricultural development objectives. Lipton (2009) noted how government officials have been major beneficiaries of post-independence land redistribution in some African countries, especially in “land abundant” countries experiencing little organized pressure from tenants and landless farmers for land.

For these reasons, we may expect the pace of farm consolidation and the characteristics of farmers driving changes in farm size distributions in much of Africa to be potentially different from the stylized Asian structural transformation model. The remainder of this article examines the evidence behind these projections.

### 3. Data

We utilize available national population-based surveys to report farm size distribution patterns for farms between 0 and 100 hectares in Ghana, Kenya, Tanzania, and Zambia. Data on area held and/or operated by small-scale (0–5 hectares) and medium-scale farms (5–100 hectares) come from the following sources: the 2005 and 2013 *Ghana Living Standards Surveys*

(*GLSS*), implemented by the Ghana Statistical Service; the 1994 *Kenya Welfare Monitoring Survey I* and the 2006 *Kenya Integrated Household Budget Survey (KIHBS)*, implemented by the Kenya National Bureau of Statistics; the *National Panel Surveys (NPS/LSMS)* 2008 and 2012, implemented by the Tanzania National Bureau of Statistics; and the *Crop Forecast Surveys*, 2008 and 2015, implemented by the Zambia Central Statistical Office.

Our premise was that these population-based data sets will be appropriate for understanding the small-scale sector because historically 90% or more of the farm households in most African countries have been between 0 and 5 hectares. However, population-based data sets, such as most LSMS, may be less than ideal for understanding the distribution of farmland ownership and use patterns if larger farms constitute a low proportion of the population (and hence a low probability of being included in the sample) but a sizeable proportion of national farmland. For example, the 2008 Tanzania LSMS contains a total of 3,265 households according to our computations, but only 15 households have landholdings over 20 hectares, and only two households have over 100 hectares. In Kenya, despite widespread anecdotal views that large farms may account for a significant portion of Kenya’s agricultural land (e.g., Namwaya, 2004), we found that the 2006 KIHBS (the most recent population-based large-scale household data set in Kenya) contains only four households with landholdings over 100 hectares. These findings raise obvious concerns about the ability of population-based surveys to generate reliable estimates of the numbers of medium- and large-scale farms, the areas under cultivation by farms of this size, and the characteristics of these farmers.<sup>5</sup>

A recent study by Lowder et al. (2016) has shown that where it is possible to compare farmland ownership and distribution from LSMS and national agricultural censuses (as they have done for several Latin American countries), the former tends to show an underreporting of large farms and operated area under large farms, and more tightly clustered and less skewed distributions.

Fortunately, Tanzania’s National Bureau of Statistics implemented a survey of 10% of all farms listed in their 2008 Census (the *Agricultural Sample Census Survey* or *ASCS*), containing a sample size of 53,600 households. The *ASCS* oversamples medium- and large-scale households and then uses statistical weights derived from the Census to generate nationally representative estimates of farm area in each size category. For these reasons, the *ASCS* is more likely to be representative of large farms than typical population-based surveys. We compare the estimates provided by *LSMS* and the *ASCS* regarding the numbers of farms and area controlled by farms categorized as small-scale, medium-scale, and large-scale according to our

<sup>4</sup> We may think of a number of reasons why acquisition of land by a local investor may not be associated with investments in farm production: (i) emergent investors may have limited liquidity and need to make investments in a phased-in manner, starting with land and eventually progressing to other investments to make the land productive, both in agriculture and nonagriculture; (ii) expected returns to land speculation may in some cases be higher than for agricultural activities—this may be the case in and around areas where population is growing rapidly; and (iii) part of the speculative calculus depends upon future state investments—e.g., land is bought and if the government provides electricity and paved roads, then agricultural investment may begin.

<sup>5</sup> Because a small proportion of farms are over 10 hectares in most African countries, valid inferences on this group would normally involve oversampling of farms in this size category to provide statistical power and the use of weighting factors to appropriately weight their contribution to national agricultural indicators.

Table 2  
Comparison of farmland owned and land under cultivation in Tanzania, 2008 Agricultural Sample Census Survey vs. 2008 LSMS/National Panel Survey

	Farm land controlled			Land under operation		
	LSMS	Ag Sample Census Survey	% difference	LSMS	Ag Sample Census Survey	% difference
By holdings of:	Million hectares			Million hectares		
0–5 ha	8.246	8.595	+4.2	8.117	8.130	+0.002
5–100 ha	3.872	5.861	+51.4	3.816	5.181	+35.8
Over 100 ha	0.809	1.294	+60.0	0.809	0.942	+16.5

Note: Land under operation = cultivated + fallow + other uses.

definitions (holdings of 0–5, 5–100, and over 100 hectares, respectively). To ascertain the potential bias associated with using LSMS data to understand farm size distributions, a comparison of Tanzania's 2008 LSMS and 2008 ASCS is presented in Table 2. The results show that LSMS and ASCS produce very similar estimates of the total hectares of farmland held among small-scale farms between 0 and 5 hectares; the two surveys produce nearly identical estimates of land under operation. For medium-scale holdings between 5 and 100 hectares, the results diverge substantially, with ASCS revealing 51.4% more land being controlled by medium-scale farms at the national level than indicated by LSMS. The results diverge even more so in terms of national land held by large-scale holdings over 100 hectares, with ASCS indicating 60% more land under the control of large-scale farms than indicated by LSMS. In terms of land under operation (defined as land cultivated, in fallow and under pasture), the ASCS reports 35.8% and 16.5% greater operated area under medium-scale and large-scale farms than LSMS.

Based on this comparison of agricultural census versus population-based surveys, we use census data where possible (Tanzania and Zambia) to report estimates for medium- and large-scale farms. Zambia medium and large farm estimates are based on the 2012/13 Crop Forecast Surveys for Small/Medium and Large Farms, although this data source is considered by interviewed Ministry of Agriculture officials to underreport farms over 20 hectares. Because census data were not available for Ghana or Kenya, we must cautiously rely on the population-based surveys as described above for these countries. To all these estimates of large-scale farmland, we add estimates of large-scale acquisitions as reported by the Land Matrix ([www.landmatrix.org/en/](http://www.landmatrix.org/en/)) between the year of the last survey or census and 2015.

We also utilize the Demographic and Health Survey (DHS) data on household farmland ownership by rural and urban-resident households, which asks respondents to report the amount of agricultural land that they own. From this, we report the share of total national agricultural land being held by urban-based households, as well as the proportion of holdings over 20 hectares held by urban households. In several countries, the DHS was implemented several times over the past decade, allowing us to estimate changes in these figures over time.

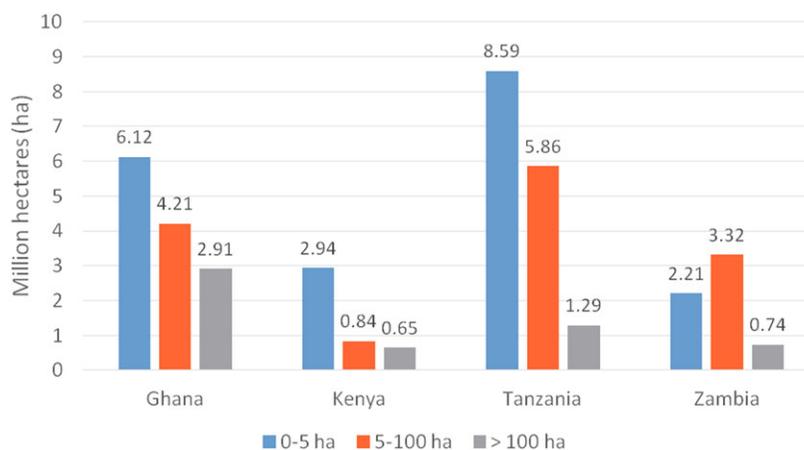
Finally, we draw upon recent surveys of medium-scale farms in Tanzania, Zambia, Kenya, and Ghana conducted by Michigan State University, the University of Pretoria, IFPRI, and

Table 3  
Counts of farm holdings over 10 hectares in five districts of Tanzania, according to three data sources

District	Region	2012 Tanzania National Panel Survey (LSMS)	2008 Agricultural Sample Census Survey	Mdoe et al. (2016)
Kilombero	Morogoro	0	1,445	1,348
Moshi (Rural)	Kilimanjaro	2,316	423	489
Njombe	Iringa	0	1,015	1,828
Mvomero	Morogoro	742	1,814	1,910
Kiteto	Manyara	0	2,982	3,668

Sources: 2012 Tanzania LSMS National Panel Survey, 2008 Agricultural Sample Census Survey, and the population lists developed by Mdoe et al. (2016).

policy institutes affiliated with the Regional Network of Agricultural Policy Research Institutes in East and Southern Africa (ReNAPRI). These exercises involved the compilation of lists of the full population of 5–100 hectare farms in selected districts in consultation with local district agricultural offices and national farmer unions. The population lists serve two purposes. First, they allow us to generate random samples within selected districts/divisions to obtain statistically representative analysis of medium-scale farms in these areas. Surveys of medium-scale farmers included modules on the socio-demographic characteristics of these farmers, where they reside, and the tenure type of their land, and retrospective life history modules that make it possible to understand how, why, and when in their lives they acquired their medium-scale holdings. A second purpose of the population lists is to assess the robustness of our numbers of farms in specific size categories with those indicated by population-based and agricultural census data in the same divisions/districts. For example, the Sokoine University of Agriculture and Michigan State University recently conducted a full listing of all farm holdings over 10 hectares operating in six districts of Tanzania in 2015/16. We compare these population lists with estimates generated by the population-based 2012 Tanzania National Panel Survey and the 2008 Agricultural Sample Census Survey described above. As shown in Table 3, our lists contain considerably more farms of 10 hectares or greater than those indicated by LSMS estimates in each of the six districts. We also find that our population lists often greatly exceed the number of farms over 10 hectares as estimated by the 2008 ASCS, though this may primarily reflect changes in the numbers of farms between 2008 and 2015/16.



*Notes:* While we define large-scale holdings as those controlling over 100 hectares and Ministry of Agriculture data for holdings at 2000 were collected according to this definition, the Land Matrix only reports large-scale holdings over 200 hectares. Therefore, the current area controlled by farms over 100 hectares is likely to be slightly higher than reported here.

*Sources:* Large-scale area owned/controlled is the sum of area under large-scale holdings according to data sources reported in Section 3, plus estimates of large-scale acquisitions between 2005 and 2015 from the Land Matrix. Data on area owned/controlled by small-scale and medium-scale farms come from the sources reported in Section 3.

Fig. 2. Area owned/controlled by small-scale (0–5 ha), medium-scale (5–100 ha), and large-scale (>100 ha) farm holdings.

#### 4. Changes in farmland ownership and control

This section presents evidence documenting the rise in the medium-scale farm sector in Africa. While the evidence base is still patchy—drawing upon just a few countries—we do observe consistent changes along several key dimensions. This section first reports the proportion of farmland held by farms in the small-, medium-, and large-scale sectors according to the most recent surveys in each country. Second, we document changes in farm structure by comparing the most recent surveys with prior comparable surveys. Third, we describe the characteristics of medium-scale farmers, as drawn from our surveys of this group. Finally, we delineate the extent of control of rural farmland by urban-based households.

##### 4.1. Share of land under small-, medium-, and large-scale holdings

Fig. 2 reports the area of land owned by small-, medium-, and large-scale farms in Ghana, Kenya, Tanzania, and Zambia. Only in Kenya is a substantial majority of national farmland, 66.1%, under small-scale farms. In Ghana, Tanzania, and Zambia, the percentages of farmland held by farms 0–5 hectares is 46.4%, 54.0%, and 35.8%, respectively. The proportions of land under farms 5–100 hectares are 31.8% in Ghana, 19.0% in Kenya, 39.0% in Tanzania, and 52.9% in Zambia. The land controlled by medium-scale farms is in all cases greater than that controlled by large-scale farms, even after adjusting large-scale estimates by accounting for recent foreign and domestic acquisitions according to the Land Matrix.

##### 4.2. Changes in operated farmland by farm size category

Table 4 reports the dynamics of farmland ownership patterns in the four countries. Because of the aforementioned unreliability of large-scale data and the lack of comparability in methods for multiple survey years, Table 4 is confined to examining changes among farms in the 0–100 hectare range using available population-based surveys.<sup>6</sup>

From the first three columns of Table 4, we see that the numbers of small-scale farms still vastly outnumber the numbers of farms over 5 hectares, and they continue to grow but at a relatively slow pace. The share of all farms under 5 hectares has declined from 92.1% to 84.5% in Ghana, and from 88.8% to 78.7% in Zambia. In Tanzania, the number of small-scale farms has stayed roughly constant. In Kenya, by contrast, the number of farms under 5 hectares has risen from 2.22 to 2.97 million between 1994 and 2006. Subdivision may have contributed to this trend, as the number of farms over 5 hectares has apparently declined precipitously over this period. With the exception of Kenya, the fastest growing segment of farms between 0 and 100 hectares is in the medium-scale sector, particularly in the farms of 20–100 hectares.

The last two columns of Table 4 show changes in the share of operated land accounted for by the various farm size categories. Here again we see a decline in the share of operated land in the 0–5 hectare range, with the exception of Kenya. In Ghana

<sup>6</sup> Note, as stated in Section 3, that the Tanzania data are based on the 2008 and 2012 LSMS/NPS data sets, which provide consistently structured questions on landholdings across years, despite the likelihood that they underreport the share of land under medium-scale holdings.

Table 4  
Changes in farm structure in Ghana (1992–2012), Tanzania (2008–2012), Zambia (2008–2014), and Kenya (1994–2006) based on official national survey data

	Number of farms (% of total)		% growth in number of farms between initial and latest year	% of total operated land on farms between 0–100 ha	
	1992	2012		1992	2005
<b>Ghana</b>					
0–5 ha	2,037,430 (92.1)	2,792,201 (84.5)	37.1	60.7	48.9
5–10 ha	116,800 (5.3)	304,182 (9.2)	160.4	17.2	19.5
10–20 ha	38,690 (1.7)	130,746 (4.0)	238.0	11.0	16.0
20–100 ha	18,980 (0.9)	78,520 (2.4)	313.7	11.1	15.6
Total	2,211,900	3,305,649	49.5	100.0	100.0
<b>Tanzania</b>					
0–5 ha	5,454,961 (92.8)	6,151,035 (91.4)	12.8	62.4	56.3
5–10 ha	300,511 (5.1)	406,947 (6.0)	35.4	15.9	18.0
10–20 ha	77,668 (1.3)	109,960 (1.6)	41.6	7.9	9.7
20–100 ha	45,700 (0.7)	64,588 (0.9)	41.3	13.8	16.0
Total	5,878,840	6,732,530	14.5	100.0	100.0
<b>Zambia</b>					
0–5 ha	984,976 (88.8)	1,142,041 (78.7)	15.9	54.1	38.8
5–10 ha	87,719 (7.9)	211,862 (14.5)	141.5	19.6	25.6
10–20 ha	29,197 (2.6)	74,959 (5.2)	156.7	13.3	18.1
20–100 ha	7,471 (0.7)	22,584 (1.6)	202.3	13.0	17.5
Total	1,109,362	1,451,446	227.2	100	100
<b>Kenya</b>					
0–5 ha	2,217,706 (92.2)	2,972,031 (98.8)	34.0	61.5	72.0
5–10 ha	93,871 (3.9)	17,451 (0.6)	–81.4	21.4	2.3
> 10 ha	92,498 (3.8)	19,493 (0.6)	–78.9***	17.1	22.7
Total	2,404,075	3,008,975	25.2	100.0	100.0

Note: Last two columns for Zambia are for land owned; Ghana, Kenya, and Tanzania are for operated farm size.

Sources: Ghana Living Standards Surveys 1992/3 and 20012/2013. Tanzania National Panel Surveys, 2008 and 2012. Zambia Ministry of Agriculture Crop Forecast Surveys, 2008/09 and 2014/15. Kenya Central Bureau of Statistics, *Welfare Monitoring Survey II, 1994: Basic Report* (Kenya: Central Bureau of Statistics, Office of the Vice-President and Ministry of Planning and National Development, 1996). Kenya National Bureau of Statistics, *Kenya Integrated Household Budget Survey 2005–2006* (Nairobi, Kenya: Kenya National Bureau of Statistics - Ministry of Planning and National Development, 2006).

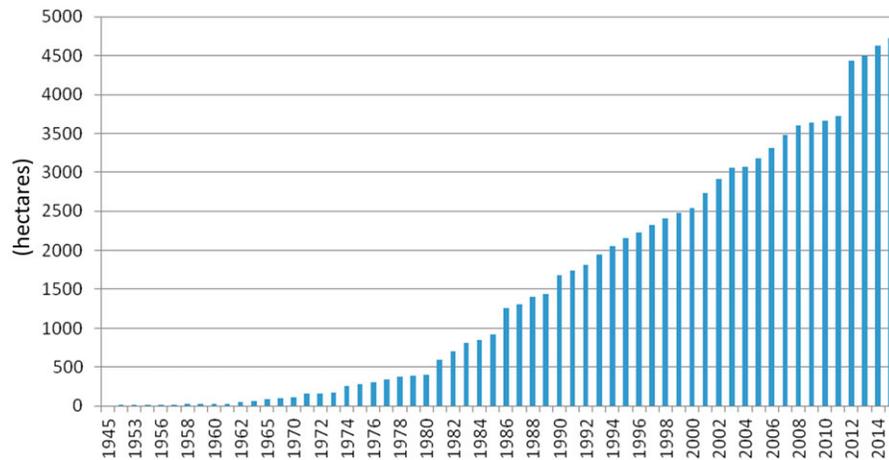
\*\*\*For reasons explained in Section 3, we believe that the official Kenya data sets underreport farms over 10 hectares (see also footnote 8).

and Zambia, the proportion of operated land accounted for by medium-scale farms in the latest surveys now surpasses that accounted for by small-scale farms. If current trends in Tanzania are maintained, medium-scale farms will account for more operated land than small-scale farms by 2017. Comparisons of the two population-based data sets for Kenya once again show an increase in the importance of small-scale holdings in total operated farmland. However, even in Kenya the proportion of land operated by farms over 10 hectares has risen, from 17.1% to 22.7% of total operated land within the 0–100 hectare range. Findings from Table 4 generally indicate rapid change in farm size distributions in recent years and that medium-scale farms are much more important in Africa's evolving agricultural sectors than is conventionally understood.

In some countries at least, the rise of medium-scale farms seems to have been especially rapid since 2000. This is evident from earlier waves of GLSS survey data for Ghana and earlier Crop Forecast Surveys in Zambia, both of which show relatively slow growth in medium-scale farms prior to 2000. Similarly, Anseeuw et al. (2016) show that the

land controlled by medium-scale holdings (between 5 and 100 hectares) in three districts of Malawi has almost doubled between 2000 and 2015, from 2,544 hectares in 2000 to 4,726 hectares in 2015 (Fig. 3). Between 2005 and 2015, the land under medium-scale holdings has increased by 49.1%. If the trends documented in these three districts of Malawi provide a general indication of changes in landholdings in the country, Anseeuw et al. (2016) conclude that roughly 300,000 hectares has been newly acquired by medium-/large-scale holders since 2005, slightly more than 10% of the total area under cultivation in Malawi.<sup>7</sup> The apparent rise in medium-scale farms over the past decade in Malawi is truly remarkable in a country where the majority of rural people face acute land scarcity and where

<sup>7</sup> Note that Malawi's official Integrated Household Survey data do not indicate a rise in the proportion of farmland controlled by medium-scale farms, possibly because it only covers farms residing in customary tenure areas, which has declined over time from 87% of Malawi's land at Independence in 1964 to roughly 66% in 2014. These gaps are worrying indicators that policy makers and researchers are not able to detect potentially major shifts in farmland ownership from existing and purportedly nationally representative data sets.



Source: Anseeuw et al. (2016), computed from medium-scale farm survey in Mchinji, Kasungu, and Lilongwe Districts undertaken by LUANAR, UP, and MSU (2014–2015).

Fig. 3. Cumulative land acquisitions by medium-scale holdings among sampled farms in Mchinji, Kasungu, and Lilongwe Districts, Malawi (ha per year).

rural household poverty is highly correlated with very small farm size (Jayne et al., 2003).

The rise of medium-scale farms has also led to a concentration of landholdings as defined by the Gini coefficient. In a study of Ghana, Kenya, and Zambia by Jayne et al. (2014), the landholding size Gini coefficients rose in all three countries, e.g., in Ghana from 0.52 in 1992 to 0.65 in 2005. A comparison of the 2008 versus 2012 NPS/LSMS data for Tanzania shows a similar rise in the Gini coefficients of various land ownership and operated farm size variables. While landholdings in most of Africa are not as concentrated as in Latin America, where Gini coefficients can be as high as 0.90, the Gini coefficients in the three African case studies are substantially higher than most Asian countries and appear to be rising over time (Jayne et al., 2003, 2014). Clearly, in all three countries, the idea of a unimodal and egalitarian farm structure within Africa's indigenous farming population has become outdated.

More information is needed on the extent to which medium-scale farms rent out their land to others. The Tanzania ASCS indicates that only 2.3% of the land held by rural households holding more than 10 hectares was rented out and that the landholding Gini coefficients are virtually unchanged after accounting for interhousehold redistributions of utilized land associated with rental markets.

#### 4.3. Characteristics of medium-scale farmers<sup>8</sup>

Who are these new entrants to the sector? Conceptually, we might start by defining two main types of medium-scale farmer: members of local rural communities who started as small-scale farmers and successfully expanded their operations

into medium-scale status, and those who primarily lived outside the area and acquired land either through purchase or agreements with traditional authorities. We refer to the first group as representing cases of *successful small-scale expansion* into medium-scale farming. The characteristics of those farmers are typically quite different from *investor farmers*—what Sitko and Jayne (2014) refer to as “lateral entry” into agriculture—who buy or negotiate for land (usually from customary authorities) using capital earned from nonfarm or civil service employment or as part of a government land development program.<sup>9</sup>

Our “life history” surveys of medium-scale farmers indicate that the growth of medium-scale farms in most areas examined so far is driven by relatively wealthy investor farmers many of whom reside in urban areas. Studies in Zambia, Malawi, and Kenya indicate that medium-scale farmers are about 60% urban-based and 35% rural-based “elites.”<sup>10</sup> Only 5% of medium-scale farms are the result of smallholder expansion (Jayne et al., 2014; Muyanga, 2013; Sitko and Jayne, 2014). Table 5 presents descriptive information on “life history” surveys of medium-scale farmers in several countries (drawing from Muyanga, 2013 and Sitko and Jayne, 2014). Table 5 reveals that these medium-scale farmers are

<sup>9</sup> Examples of the latter include the recent “block farm” programs in Ghana and Zambia. In Zambia's case, the government has negotiated with chiefs to transfer roughly one million hectares of customary land to the state for development of nine block farms, containing a large nucleus farm surrounded by roughly 350 private farm holdings on 86,000 hectares, the majority of holdings being between 25 and 500 hectares. See <http://www.afdb.org/en/projects-and-operations/project-portfolio/project/p-zm-aac-005/> (last accessed July 15, 2016).

<sup>10</sup> We use this term as shorthand for people who, according to the life history surveys, started out with considerably larger landholdings than the majority of rural people and whose parents tended to be relatively affluent and prominent people in the community (e.g., chiefs, government officials).

<sup>8</sup> Parts of this section draw on Jayne et al. (2014).

Table 5  
Characteristics of medium-scale farmers

	Mode of entry into medium-scale farming status			
	Zambia		Kenya	
	Growth from small-scale farming ( <i>n</i> = 118)	Acquisition of land from nonfarm employment ( <i>n</i> = 164)	Growth from small-scale farming ( <i>n</i> = 120)	Acquisition of land from nonfarm employment ( <i>n</i> = 180)
% of cases	42	58	40	60
% men	92.9	91.4	82.5	80.0
Year of birth	1966	1960	1945	1947
Years of education of head	8.2	11.0	7.5	12.7
Have held a job other than as a farmer (%)	32.9	100.0	17.5	83.3
Formerly or currently employed by the public sector (%)	5.8	59.6	12.5	56.7
Initial landholding size when started farming (ha)	28.8	106.6	14.0	22.6
Current landholding size (ha)	38.2	74.9	32.7	50.1
% of land currently under cultivation	46.9	24.7	54.1	46.6
Decade when land was acquired				
1969 or earlier	3.9	1.1	29	6
1970–79	6.7	5.1	24	18
1980–89	14.8	7.4	20	20
1990–99	32.2	23.8	18	32
2000 or later	42.0	63.4	9	25

Sources: Sitko and Jayne (2014), Muyanga (2013).

predominantly men; their primary jobs were in the nonfarm sector, the majority of these being in civil service employees. Many of these farmers live in urban areas, are relatively well educated, and are current or former government employees. Most of these urban-based emergent farmers financed their land acquisitions from nonfarm income. The majority in Zambia acquired their farms after the age of 40. Using their savings from their nonfarm jobs, they were able to acquire farms and enter farming during their mid-life stages. This profile fits roughly 60% of the sampled medium-scale farmers in Kenya and 58% in Zambia. A smaller but still important category of medium-scale farmer is relatively privileged rural-born men who were able to acquire large landholdings as they started out their careers. Only in Chapoto et al.'s (2013) study of Northern/Central Ghana did a significant proportion of medium-scale farmers start out with less than five hectares of land. The Ghana findings provide at least some room for optimism that small-scale farmers can expand into commercialized medium-scale stature under favorable land access conditions.

What is less clear is the productive orientation of the medium-scale entrants. We do observe that, at least in Kenya, Malawi, and Zambia, larger farm sizes are inversely related to the share of land operated (defined as land under crops, pasture, and fallow) (Muyanga and Jayne, 2016; Sitko and Jayne, 2014). Based

on the Tanzanian ASCS, for example, farms over 20 hectares utilized only 29% of their land for crops, 29% for pasture, and 23% for fallow, whereas farms under five hectares utilized 81% of their land for crops, 1% for pasture, and 10% for fallow. At the same time, however, we observe that medium-scale farms are responsible for an increasing share of the national marketed crop surplus in some countries (e.g., Hichaambwa and Jayne, 2014). Widespread anecdotal reports from private agribusiness company officials also suggest that medium-scale farms are driving new investments by large grain trading companies, suppliers of mechanization equipment, and other agribusiness investments.

#### 4.4. Rise in share of national farmland controlled by urban-based households

In addition to changes in farm structure, there appear to be important changes taking place in the locus of control of farmland. DHS data reveal some surprising facts about the importance of agricultural land held by households residing primarily in urban areas. Among the African countries for which data are available for multiple survey years, households whose primary residence is urban control from 6.5% to 32.7% of total national agricultural land (Table 6). In the DHS data, respondents' landholdings

Table 6  
Agricultural landholding distribution patterns (Demographic and Health Surveys, various years)

	Ghana		Kenya		Malawi*		Tanzania		Zambia*	
	2008	2014	2009	2014	2004	2010	2005	2010	2007	2014
<i>n</i> = households	11,777	11,835	9,057	36,430	13,664	24,825	9,735	9,623	7,164	15,920
% of urban HHs owning agricultural land	23.4	21.9	35.3	47.7	31.4	38.6	41.7	37.9	27.4	24.8
% of rural HHs owning agricultural land	66.7	58.7	78.1	79.2	86.6	87.4	92.3	87.4	88.3	88.1
% of HHs (nationally) owning agricultural land	46.0	38.5	67.0	66.0	77.4	79.3	79.0	74.5	67.2	61.7
% of national landholdings held by urban HHs	26.8	31.9	22.0	32.1	3.0	6.5	11.8	32.7	16.8	22.0
% of landholdings of 20 ha or more held by urban HH	36.9	42.7	34.3	41.2	1.2	7.6	17.2	78.9	21.7	29.3

\*For Zambia, Malawi, and Kenya, landholdings over 95 hectares were reclassified as 95 hectares in the DHS data. For Ghana, landholdings over 38 hectares were represented in the DHS data as 38 hectares. These caps on the reported landholding size may result in underestimates of the land controlled by urban households.

Source: Demographic and Health Surveys.

over a certain size are reported as a maximum size limit, generally 95 hectares (see notes under Table 3). Even with these truncations of reported data, the share of total agricultural land held by urban households was found to be surprisingly high in some countries, e.g., 32.1% in Kenya in 2014 and 32.7% in Tanzania. Moreover, the share of national agricultural land owned by urban-based households has risen in each of the five countries for which repeat data are available. The share of national farmland owned by urban-based households is particularly striking for landholdings over 20 hectares. For this category of farms, once again we see a discernible rise in the share of national farmland owned by urban households even over the span of a few years.

## 5. Causes of the rise of domestic investor farms

African “elite” farmers have been referenced since pre-independence times, often promoted by “master farmer” programs instituted by colonial governments to promote agricultural development in African farming areas (Anseeuw et al., 2016). In the post-independence period, redistribution of white settler farms also gave rise to a small class of medium- and large-scale African farmers in countries such as Kenya and Zimbabwe (Lipton, 2009).<sup>11</sup> In other countries, post-independent governments allocated land to minions to entrench political control and serve patronage objectives, which nurtured the development of an “estate farm” sector, for example, by the Banda government in Malawi (Anseeuw et al., 2016).

Hence, while acknowledging that medium-scale African farms have existed for decades, this study documents the rapid rise of medium-scale “investor farmers” since roughly 2000. This phenomenon appears to be associated with several recent developments: (i) the rise in global food prices since 2005; (ii) the related development of markets for agricultural inputs

and mechanization; and (iii) a shift in the emphasis of agricultural programs and land policies in some countries favoring commercialized agriculture, which has often been correlated with (iv) the post-structural adjustment multiparty democratic process in many countries that has enabled farm lobby groups to gain greater voice in articulating the interests of “emergent farmers,” many of whom are medium-scale in their operations. There is considerable cross-country variation in these factors, warranting caution against overgeneralization. Yet in the set of countries examined in this study, most of these factors appear to be salient.

### 5.1. Higher global food prices

Food prices in Africa rose substantially after the global food price surge of 2007/08.<sup>12</sup> This has fueled an increase in demand for farmland as both global and domestic investors recognized that quality farmland in parts of Africa was undervalued.<sup>13</sup> The sustained agricultural productivity growth that many African countries have experienced in the recent period of high local and world food prices (e.g., Brooks, 2015) also suggests that new land acquisitions during this period reflect perceptions of the profitability of agriculture as a business for those able to mobilize sufficient land, capital, and management expertise. Reductions in trade barriers in some African countries have enabled domestic food prices to be better aligned with import parity conditions compared with earlier years (Anderson and Masters, 2007). While foreign investor interest in African farmland during the recent period of high food prices has been a feature of the “land grab” narrative for several years now

<sup>12</sup> Even though 2015 has witnessed a sharp fall in global food prices, the international prices of maize, rice, and wheat in early 2015 adjusted by two different global deflators (the U.S. GDP deflator and the global Manufacturing Unit Values Index) are still roughly 42%, 48%, and 35% higher in 2015 than their averages between 1995 and 2005. Maize, rice, and wheat prices over the 2007–2015 period are 68%, 66%, and 55% higher than their inflation-adjusted 1995–2015 averages (based on World Bank Pink Sheet data).

<sup>13</sup> Land rental fees in high-potential areas of Kenya, for example, have quadrupled between 2004 and 2014, rising more rapidly than wage rates or other inputs into agricultural production (Muyanga and Jayne, 2016).

<sup>11</sup> Toyé (1992) was among the first to note that many state officials, especially in East and Southern Africa, have become large farmers with a stake in forwarding the case for selective agricultural subsidies and continued state involvement in the distribution of inputs on credit, and price supports for farm commodities.

(e.g., Deininger and Byerlee, 2011), the same motivations may equally well apply to the rising interest in African farmland by domestic investors.

### 5.2. Improved access to inputs and technology

In many parts of the region, investment conditions appear to be improving for commercially-oriented agriculture (Deininger and Byerlee, 2011). The Maputo Declaration of 2003 galvanized African governments' commitment to re-investing in agriculture. Many forms of increased government spending to agriculture were in the form of subsidies (inputs, the resurgence of marketing board operations offering high prices for strategic crops, block farms), much of which could be captured disproportionately by relative large and commercialized African farmers (Mason and Jayne, 2013; Pan and Christiaensen, 2012). Higher agricultural prices and rapidly growing urban markets also stimulated improvements in input supply chains and markets for mechanization services.

### 5.3. Relative profitability of larger-scale farming

A third cause of the rise of domestic investor farms is that they appear to constitute a scale of farming that is more profitable for the owner/operator, and which may therefore out-compete small-scale farming for arable land. Larger farms may have advantages with respect to the market as well as with respect to navigating both customary and statutory land institutions to access land. Regarding market advantages, the net revenue produced on the farm per family adult is clearly higher on larger farms compared to small-scale farms (Nkonde et al., 2015; Muyanga and Jayne, 2016). Especially since the rise of world food prices in the mid 2000s, the profitability of commercial farming has increased and this has been associated with the increase in land acquisitions in the region. In prior decades, constraints on access to capital, needed inputs, and management expertise (along with generally lower real agricultural prices) may have limited the ability and incentives of local entrepreneurs and civil service people to venture into commercial agriculture.

These points are not necessarily inconsistent with the literature on the inverse farm size–productivity relationship (IR). The IR literature generally shows that small farms are more efficient per unit land in Asia and Africa (e.g., Carletto et al., 2013; Larson et al., 2012; Lipton, 2009).<sup>14</sup> However, the IR literature generally compares farms of a limited farm size range, generally between 1 and 10 hectares and to our knowledge has never utilized African data to analyze the efficiency of farm sizes of the magnitude commonly being acquired by domestic investors in Africa. Nkonde et al. (2015) and Muyanga and Jayne (2016) find that while there are relatively small differences in

the net value of crop output per cultivated hectare between 2, 20, and 50 hectare farms, the profits (net value of output to the owner/operator) are overwhelmingly in favor of the relatively large farm. The main factors limiting further expansion in the scale of operation according to the domestic investors themselves are management know-how, inability to find trustworthy managers who will run the farm on their behalf without dipping into the profits, access to capital to expand operations, and in some cases not wanting to become so large as to arouse jealousy and conflict within the local community (Nkonde et al., 2015; Muyanga and Jayne, 2016). Therefore, as long as global and local food prices remain favorable, and with continued development of agricultural value chains and rapid population growth in the region, both domestic and international investors may continue to put upward pressure on the demand for, and price of, farmland in many parts of Africa, especially as the potential for farmland expansion in other regions of the world is increasingly limited (Headey, 2015).

### 5.4. Farm lobbies and union capture

After roughly a decade of often intense struggle between African governments and international lenders over the course of agricultural policy between 1985 and 1995, local interests regained control over the policy agenda starting in the early 2000s, often within nascent multiparty political systems. This often motivated parties to adopt populist stances offering greater tangible benefits to constituencies, such as input subsidies and support prices for local farmers in the name of food self-sufficiency.<sup>15</sup> These developments enhanced the voice and influence of national farmer unions that ostensibly lobbied for the interests of the farming community. However, farmers are not a homogeneous group and particular policies affect them in different ways. For example, most small-scale farmers are buyers of staple grains, and hence are adversely affected (at least in the short run) by marketing and trade policies that raise food prices. By contrast, most medium- and large-scale farms are grain sellers. Farmer unions in some countries lobby forcefully for a system of agricultural subsidies that channel the majority of public expenditures to agriculture for their benefit (Binswanger et al., 1995). Most national farmer unions in the region support policies that raise food prices, promote the conversion of land from customary tenure to statutory land to promote access to land through market transactions, farm block programs, and input and credit subsidy programs that allow bigger farms to participate in the programs. Common rhetorical themes used to justify this position are that public support should go to “progressive” farmers who view “farming as a business” and have adequate access to capital. These positions tend to represent the interests of larger farmers, and at a minimum suggest the possibility that some of the national farmer

<sup>14</sup> We may note that this result often rests on not counting family labor input, or valuing it at a very low wage rate.

<sup>15</sup> For example, see the November 2014 special issue of Development Policy Review on “The Political Economy of Agricultural Policy in Africa.”

unions have been captured by these interests (Sitko and Jayne, 2014; Toye, 1992).

Transfers of land from customary tenure to formal or informally privatized land appear to be associated with the rise of domestic investor farmers in at least some countries such as Zambia and Malawi. Where customary land institutions still exist, they appear to be increasingly utilized by wealthy outsiders as a means to acquire land (German et al., 2011). Negotiation with local authorities is often a relatively easy way for wealthy people to acquire land cheaply compared to buying land in statutory tenure areas where land values have already been bid up to market levels. This often (although not necessarily) results in a transfer of land from customary tenure (under the authority of chiefs or their representatives) to statutory tenure with freehold or long-term lease titles (German et al., 2011; Honig and Mulenga, 2016). One potential outcome of such trends is that less land is available as a birthright of future generations of people born in customary tenure areas.

## 6. Consequences of the rise of medium-scale investor farms

Despite evidence of important changes taking place in farmland ownership patterns in Africa, the consequences of these changes are poorly understood. Little research on this topic might be understandable given that official agricultural statistics are often not well suited to detecting or accurately quantifying changes in farmland ownership or structure over time. As a result, the evidence base for quantifying the impacts of changing farm structure is weak, yet the following patterns appear to be emerging: (i) evolving land markets and land governance institutions, with an associated shift in local power from chiefs to state authorities; (ii) changes in rural–urban multiplier effects resulting from agricultural productivity growth; (iii) increased concentration of the marketed surplus for some food crops; (iv) changes in service provision and technologies along agricultural value chains, including the increased use of farm mechanization; and (v) rising land scarcity for smallholders.

### 6.1. Evolution of land markets and governance institutions

Land sales markets are now developing as more land is converted from customary to statutory tenure (Holden et al., 2009). Perhaps linked with this, a large proportion of land in some countries has shifted over time from customary land, controlled by traditional authorities, to statutory tenure systems with formal title. In Malawi, 87% of the country's total land was customary land at independence but this has declined to 66% in 2014 (Anseeuw et al., 2016). In Zambia, the proportion of the nation's land under customary tenure is widely acknowledged to be declining and is almost certainly smaller than frequently cited statistics indicate (Honig and Mulenga, 2016; Sitko and Chamberlin, 2016). Already, about 10% of the land within Zambia's smallholder sector is titled (Sitko and Jayne, 2014).

Land rental markets appear to be developing rapidly. Evidence to date indicates that rental markets are transferring land from relatively large to small farms (Deininger et al., 2015), although the quantity of land redistributed through rental markets is normally a tiny fraction of total land owned. Computed Gini coefficients of operated farm size tend to be negligibly smaller than Gini coefficients of land ownership from the same data sets (Deininger et al., 2015; Jin and Jayne, 2013). However, this may change with time as market access conditions improve. The broader general equilibrium effects of the rise of land rental markets in parts of Africa would be an important area for further research.

A major policy question here is how the “modernization” of land institutions is affecting access to land by local rural communities that contain the vast majority of smallholder farmers. There is some evidence that land rental markets may be improving access to land by the relatively land poor (Jin and Jayne, 2013; Chamberlin and Ricker-Gilbert, 2016). However, there are major concerns that land sales markets and the alienation of land from customary tenure systems (through title conversion) are improving relatively wealthy investors' access to land at the expense of the smallholder majority. There are both static and longer-term considerations: displacement of local people in the process of domestic investor land acquisitions appears to be a problem in some areas (e.g., in Anseeuw et al.'s Malawi study, where 39% of the medium-scale farm acquisitions were reported by the respondent to entail some dispossession of former claimants) but not in Chapoto et al.'s (2013) study of Northern/Central Ghana. Land transferred to private titled land can no longer be allocated as an inheritance to people living in customary tenure areas. A greater portion of land converted to statutory land tenure may make it more difficult for rural-born people to acquire land in the future and hence increase the rate at which young people born in rural areas must migrate to seek work elsewhere (Bezu and Holden, 2014). Today's land deals affect tomorrow's livelihood options.

### 6.2. Multiplier effects and rural growth

The rise of medium-scale farms in the region produce complex impacts likely to vary substantially across countries and pose major difficulties for quantitative *ex ante* assessment. Woodhouse (2003), over a decade ago, documented cases of land scarcity leading to land markets and a consequent reallocation of land from local people to commercially oriented buyers. There are obvious income-distributional effects when land is reallocated from a unimodal small-scale structure to a large-farm structure, including the conversion of many former owner-operators controlling their means of production into wage laborers, thereby creating producer surplus for a large owner-operator and the release of surplus agricultural labor to other sectors. To the extent that nonfarm employment opportunities and access to education are favorable, the

negative consequences of such a scenario could be overcome through broader economic transformation processes. Of course, these favorable dynamics have yet to reach many areas of Africa.

The conversion of land from customary to statutory tenure as noted earlier may, other things equal, speed up the rate at which the work force shifts from farm to nonfarm sources of employment and encourage land to be transferred from less productive to more productive users (Holden, Otsuka, and Place, 2009). Bezu and Holden (2014) find that young people's probability of migrating to urban areas in search of jobs is inversely related to the amount of land owned by their parents and the number of siblings competing for their parents' land. Migration to towns and cities and from farm to nonfarm activities is generally found to be associated with a rise in average labor productivity (McMillan et al., 2014), but there is a limit to the degree of urban migration that is possible without saturating the nonfarm job situation,<sup>16</sup> and a recent study by McCullough (2015) indicates that farm and nonfarm returns to labor are already largely equalized after accounting for the greater number of work hours spent by laborers in nonfarm jobs. A better understanding of how changes in farmland ownership and land scarcity affect migration and the labor market, and how these effects vary between hinterland and well-connected rural areas, is a major area for future research.

Another important way of thinking about the multiplier effects of agricultural growth filtering through a changing farm ownership structure involves considering the implications of growing rates of nonlocal farm ownership and the spatial dimensions of these effects. Given that a sizeable minority of national agricultural land is controlled by households that are primarily based in urban areas, as shown in Table 6, it is possible that the relationship between agricultural growth and urban employment/income growth is growing stronger. Surveys of medium-scale farmers in Malawi and Zambia indicate that between 25% and 40% of the area under their cultivation is owned by absentee landholders living in urban areas (Jayne et al., 2014; Anseeuw et al., 2016). Extrapolating from these numbers, one could argue that a sizeable proportion of revenue from agriculture, despite being generated in rural areas, is spent in urban areas in these countries. Such a situation would generate potentially stronger agricultural multiplier effects on urban-based employment and income growth and weaker ones in rural areas. Collecting more accurate data on the spatial dimensions of expenditure patterns by medium-scale farmers (disaggregating between those based in rural and urban areas) would be an important step in more accurately understanding the potentially complex and variable multiplier effects stemming from the rise of this class of farms.

### 6.3. Rising land scarcity and reduced potential for smallholder expansion

The conversion of land from customary to statutory tenure in the context of rising rural populations still largely dependent on customary land for their livelihoods may be hemming in the scope for area expansion by small-scale farmers, particularly in densely populated regions. Woodhouse (2003) refers to an "African enclosures" process in some areas. Rising land scarcity, in turn, may be contributing to forms of unsustainable land intensification such as elimination of fallows, increased cropping intensities with attendant soil mining, reduced crop rotations due to pressures to produce enough staple maize each year, and other forms of land degradation. It may be regarded as somewhat naïve to expect agricultural growth strategies in smallholder areas to rely exclusively on intensification pathways; historically and even in recent years, most of the region's agricultural growth has taken place via area expansion (Fuglie and Rada, 2013). Thus, a major concern is how changing farm structure may be affecting access to land by households residing in densely populated rural areas facing land scarcity.<sup>17</sup>

Of sub-Saharan Africa's total land area of 23.6 million square kilometers, estimates of the potentially available cropland (PAC) vary from 2.0 to 4.3 million km<sup>2</sup> (Deininger and Byrlee, 2011) to 1.0–1.5 million km<sup>2</sup> (Chamberlin et al., 2014), to even less (Young, 1999). The concept of quantifying PAC has sometimes been criticized because land available for agriculture is somewhat elastic with respect to the price of food and energy (Hertel, 2011). But it is equally true that there are limits to how much land in any given country can be converted to cropland given fixed land endowments. By all estimates, PAC in sub-Saharan Africa is highly concentrated in 6–8 countries. Over 90% of the unforested land categorized as unutilized in sub-Saharan Africa is concentrated in 9 of the region's 54 countries (Chamberlin et al., 2014). The implications of this concentration is that surplus stocks are, at best, most easily available to agricultural populations already residing within those countries where such stocks are found. This excludes the vast majority of the region's agricultural populations, many of which are located within land constrained countries with limited access to surplus land in other areas (e.g., Malawi, Rwanda).

The upshot is that the observed patterns of expansion by medium- and large-scale emergent investors will likely exacerbate land access constraints by smallholders in many parts of the region, even outside of the obvious hotspots. Jayne et al. (2014) estimate that a sizable share of the remaining stock of unutilized arable land has already been claimed by non-local investors (both national and foreign) in Ghana, Kenya, and Zambia. While there is great heterogeneity within the region, we know that many countries will soon exhaust their land

<sup>16</sup> Except for urban economies that are mainly export oriented, which is atypical in Africa.

<sup>17</sup> Just 1% of Africa's rural land area contains 21% of its rural population, while 20% of its rural lands contain 82% of its rural people. The most densely populated 20% of Africa's lands contain 25 times more people than the least densely populated 20% (Chamberlin et al., 2014).

frontiers (e.g., Uganda, Nigeria) if they have not done so already (e.g., Kenya, Rwanda, Burundi, Malawi) (Chamberlin et al., 2014). This means that agricultural development strategies that tacitly or explicitly expect production growth to come from area expansion will be increasingly untenable in many areas.

## 7. Conclusions

For decades, conventional perceptions of African agriculture were based on the premise of unimodal, small-scale farming systems. Severe land inequalities were well known to exist in former colonial settler economies such as Zimbabwe, Zambia, and South Africa, but even here the smallholder farm sectors were typically characterized as small and relatively unimodal and equitably distributed land holdings situated within a bimodal distribution of land between large- and small-scale farming sectors. However, despite wide recognition of the importance of agrarian structure in influencing the multiplier and poverty reducing effects of agricultural growth, surprisingly little attention has been devoted to quantifying land distribution patterns within Africa's farming sectors.

Our analysis suggests that major changes in farmland ownership and use may have been in motion over the past decade in parts of Africa. In each of the four countries examined (Ghana, Kenya, Tanzania, and Zambia), more land is today under the control of medium-scale farms (5–100 hectares) than those of foreign and domestic large-scale farms over 100 hectares put together. Moreover, the number of medium-scale farms is growing rapidly—much faster than small-scale holdings. In at least some areas, the majority of these farms are controlled by urban-based investors or rural elites. The share of total operated farmland controlled by small-scale holdings under 5 hectares has been declining, quite rapidly in some cases, with the exception of Kenya. These trends mirror potentially associated trends in the conversion of land from customary to leasehold and freehold title (Sitko and Chamberlin, 2016; Anseeuw et al., 2016). Moreover, there is strong evidence that the concentration of landownership and use, as represented by the Gini coefficient, is rising in each of the four countries examined.

In short, there appears to be great dynamism in farmland ownership and farm size distribution patterns. One might consider that farmland use patterns are more important than farmland ownership patterns, but data indicate that the two do not vary much from one another because of the still relatively small share of total agricultural land under rental market arrangements (Deininger et al., 2015).

We do not yet know how generalizable these trends are across the region. However, it is probably safe to say that existing population-based data collection platforms are systematically underreporting a very dynamic segment of African agriculture: the medium-scale farms. While this omission is understandable, it has profound implications. Under the status quo, African governments cannot monitor, much less understand,

how farm structure is changing over time. Similarly, policy makers cannot adequately address such routine questions as the magnitude and location of marketed agricultural surplus. These questions are certainly important for guiding strategic policy decisions aimed at stimulating agricultural growth, reducing rural poverty, and managing strategic food reserves and trade policies.

Redressing this informational blind spot will require new modes of data collection and will certainly not be cost-free. We advocate for the expansion of agricultural sample census surveys, as was recently done in Tanzania, to better capture the magnitude, location, and other characteristics of this growth of medium and large farms that cannot be adequately captured via population-based LSMS-type surveys. We also advocate for the systematic collection of data on nonlocal land control, i.e., ownership or other usufruct rights over rural agricultural land held by urban or other nonlocally residing households. This will require new approaches to sampling, listing, and enumeration, as well as questionnaire designs that explicitly capture nonlocal holdings.

With better information in place, a number of key research questions become more easily assailable. For example, how does farm structure condition rural poverty, economic growth, and the interplay between the two? How is the net geographic shift in the locus of control of farmland—i.e., from rural to urban-based households—affecting development outcomes? What is the productive orientation of the majority of emergent farmers? What spillovers are there between investor farms and “traditional” smallholder farms in nearby areas? And how are changes in rural farmland ownership affecting private sector investments in agricultural value chains? While recent work has documented how changes in urbanization and consumer incomes are affecting investment in the downstream stages of the food systems (e.g., Reardon, 2015; Tschirley et al., 2015), our work suggests that downstream food systems dynamics may be greatly affected by changes in farmland ownership structure and the multiplier effects resulting from such changes (e.g., Sitko and Chisanga, 2016). Particularly relevant is our finding that a sizeable share of national agricultural land is controlled by urban-based households, many of whom are medium-scale investor farmers who may be altering the relationship between the location of agricultural growth and the strength and location of growth multipliers with the nonfarm economy.

### *7.1. Issues for future research: potential consequences of changes in farmland distribution*

Concentration of arable land resources may have profound consequences for both the pace and the nature of growth within rural economies. The seminal work of Johnston and Kilby (1975) and Mellor (1976) placed heavy emphasis on the importance of growth multipliers as drivers of the developmental process, i.e., the propensity to spend additional income, the nature of those expenditures, and their impacts within rural economies.

Empirical work by Deininger and Squire (1998) and Vollrath (2007) have demonstrated that relatively egalitarian land distribution patterns have tended to generate more broadly based growth—and consequently higher rates of economic growth—than in cases where land distribution was highly concentrated. The basic reason for this is that broad-based agricultural growth tends to generate greater second-round expenditures in support of local nontradable goods and services in rural areas and towns. These multiplier effects tend to be much weaker when the source of agricultural growth is concentrated in relatively few hands.

Recent studies have examined the strength of growth multipliers between agriculture and nonagriculture (e.g., Christiaensen et al., 2011). Many of these studies treat “agriculture” as sufficiently homogeneous across countries and within countries to allow estimation of the effects of agricultural growth on poverty reduction without reference to farmland distribution patterns. However, a wealth of agrarian structure research dating back to the 1960s and 1970s emphasized that how productive assets are distributed within communities affects rates of economic growth as well as the poverty-reducing effects of the growth that does occur (e.g., Binswanger et al., 1995; Johnston and Kilby, 1975; Lipton, 2009; Mellor, 1976). Ravallion and Datt (2002) found that the initial percentage of landless households significantly affected the elasticity of poverty to nonfarm output in India. Gugerty and Timmer’s (1999) study of 69 countries found that, in countries with an initial “good” distribution of assets, both agricultural and nonagricultural growth greatly benefitted the poorest households with positive poverty reducing effects. In countries with a “bad” distribution of assets, however, economic growth was skewed toward wealthier households, causing the gap between rich and poor to widen. It is especially noteworthy that in this latter group of countries, agricultural growth was associated with greater increases in inequality than was nonagricultural growth.

Mellor, Johnston, Lipton, and others have clearly documented that productivity growth sufficient to produce a surplus on millions of small farms in Green Revolution Asia was crucial to structural transformation and rapid poverty reduction. They contrasted the Asian experience with parts of Latin America, which also achieved agricultural growth, but not in an inclusive way. *Latifundia* estates expanded production impressively in many cases while millions of small peasant farms remained mired in poverty and were often dispossessed of their land. A major lesson for Africa from these contrasting experiences of smallholder-led Asia and estate-led Latin America was that for agricultural growth to rapidly reduce poverty, it must be inclusive enough to generate strong growth multipliers to kick-start the processes of structural transformation.

Given the importance accorded to multiplier effects in these theoretical and empirical treatments of structural transformation, we propose that the lack of attention to farm structure in recent empirical studies of growth is problematic, particularly for sub-Saharan Africa. It is our contention that the nature (i.e., pace, inclusiveness, and poverty-reducing effects) of the

growth process in the region is fundamentally linked with the distribution of access to productive farmland. Jayne et al. (2003) showed that the distributions of farm size and farm household income were highly correlated in a number of sub-Saharan African countries, with more concentrated land distributions corresponding to more unequal asset bases and income distributions. Hichaambwa and Jayne (2014) use nationally representative data from Zambia to show that, even after controlling for other household assets and sociodemographic characteristics, initial farm size is a strong predictor of participation in markets, and thus of participation in market-based agricultural growth. Several studies (Mason and Jayne, 2013; Pan and Christiaensen, 2012; Ricker-Gilbert et al., 2011) show that larger and wealthier farmers disproportionately capture government input and output marketing supports. In short, there has been a growing corpus of evidence in recent years that farm size distributions are linked directly or indirectly to the means to participate in broader processes of agricultural growth. Thus, we may reasonably expect *a priori* that agricultural growth may produce different kinds of multiplier effects (with respect to location, strength, and distribution of benefits and costs) in areas with relatively high versus low levels of land ownership inequality.

The dynamic long-term effects of changes in the control over farmland and the means of agricultural production are ultimately empirical questions. At present, we can only speculate about these effects. In this article, we have emphasized one outcome that seems particularly likely: the multiplier effects generated from surplus agricultural production are likely to be attenuated—particularly for local rural economies—as greater shares of farm surplus are produced by fewer and relatively wealthier households, many of whom live outside the local community. To the extent that this is something we should be concerned about, then we should be paying closer attention to monitoring changes within Africa’s farm sector and the forces that are shaping such changes.

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