

# Are medium-scale farms driving agricultural transformation in sub-Saharan Africa?

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## Abstract

This study presents evidence of profound farm-level transformation in parts of sub-Saharan Africa, identifies major sources of dynamism in the sector, and proposes an updated typology of farms that reflects the evolving nature of African agriculture. Repeat waves of national survey data are used to examine changes in crop production and marketed output by farm size. Between the first and most recent surveys (generally covering 6 to 10 years), the share of national marketed crop output value accounted for by medium-scale farms rose in Zambia from 23% to 42%, in Tanzania from 17% to 36%, and in Nigeria from 7% to 18%. The share of land under medium-scale farms is not rising in densely populated countries such as Kenya, Uganda, and Rwanda, where land scarcity is impeding the pace of medium-scale farm acquisitions. Medium-scale farmers are a diverse group, reflecting distinct entry pathways into agriculture, encouraged by the rapid development of land rental, purchase, and long-term lease markets. The rise of medium-scale farms is affecting the region in diverse ways that are difficult to generalize. Findings indicate that these farms can be a dynamic driver of agricultural transformation but this does not reduce the importance of maintaining a clear commitment to supporting smallholder farms. Strengthening land tenure security of local rural people to maintain land rights and support productivity investments by smallholder households remains crucial.

## KEYWORDS

agricultural transformation, farm size distribution, farm surveys, land tenure, medium-scale farms

## JEL CLASSIFICATION

O13, Q12, Q15, Q18, Q24, R14

## 1 | INTRODUCTION

Ever since the critical acclaim given to the Asian green revolution starting in the 1980s, it has been widely accepted that a

smallholder-led growth strategy would also be the pathway for achieving economic transformation and mass poverty reduction in Africa. Over 90% of farms in South and East Asia were smaller than two hectares at the beginning of the Green

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Revolution (Hayami & Ruttan, 1971; Johnston & Kilby, 1975). Because small-scale farms also constitute the vast majority of farms in Africa, agricultural economists have generally accepted that a smallholder-led strategy also holds the best prospects for agricultural development in Africa (e.g., Hazell, Poulton, Wiggins, & Dorward, 2010; Mellor, 1995).

However, parts of sub-Saharan Africa (SSA) are witnessing rapid changes in farm size distributions. “Medium-scale” farm landholdings of five to 100 ha now account for a substantial and growing share of farmland in many African countries (Jayne et al., 2016).<sup>1</sup> Perhaps ironically, the amount of land acquired by this category of African farmer since 2000 far exceeds the amount of land acquired by foreign investors (Jayne et al., 2014a). This might be considered a surprising development, but in retrospect, perhaps it should not have been. The dramatic rise in global food prices after 2007 initiated major foreign investment in African farmland. Why should not African investors have done the same?

Parallel to these developments, the region is witnessing changes in land tenure institutions that influence who is acquiring land (Boone, 2014; Knapman, Silici, Cotula, & Mayers, 2017). Parts of the region are experiencing a notable shift in the allocation of customary land, moving from a rights-based approach that secures access to land for local-born members of the community to market-based approaches in which land becomes a commodity for rent or sale. Although SSA’s rural areas contain 20.3 million km<sup>2</sup> of land, only 25% of the region is arable (CIA 2019). With an estimated rural population of 620 million people in 2017, the region is sparsely populated at 31 persons per km<sup>2</sup>. However, roughly 72% of SSA’s rural population resides on only 10% of its rural areas (Jayne, Chamberlin, & Headey, 2014b). For this majority of the region’s rural population, the average population density is 223.2 persons per km<sup>2</sup>. Hence, even though most of SSA might be considered “land abundant” and sparsely populated, a relatively large proportion of rural Africans face land scarcity, rapidly rising land prices, and perceptions of tenure insecurity (Knapman et al., 2017; Lawry et al., 2014; Wineman & Jayne, 2018). As population densities rise and land becomes scarcer in many areas, tenure security is becoming increasingly important, as research evidence shows that security of tenure generally promotes long-term land investments and agricultural productivity (Atwood, 1990; Goldstein, Hounbedji, Kondylis, O’Sullivan, & Selod, 2015; Holden, Deininger, & Ghebru, 2009; Place, 2009).

African policy makers and development organizations are increasingly interested in whether these new trends in farm

size distributions are beneficial for small-scale farm households, who still constitute the vast majority of rural households in Africa, and whether they are promoting or retarding equitable forms of economic transformation in Africa. This study reviews the evidence on these policy issues.

To address these questions, we focus on the causes and consequences of the rise of medium-scale farms in Africa. This literature remains highly limited by the fact that accurate data on farms over 20 ha is not available in the majority of African countries. We therefore collected new primary data on medium-scale farms that are considered statistically representative of farms operating between 5 and 100 ha for particular districts or comparable administrative units in Malawi, Nigeria, and Senegal. While most of the studies attempting to analyze farm structure in Africa utilize Living Standards Monitoring Surveys (LSMS) or similar nationwide farm data sets, it is increasingly acknowledged that almost all of these datasets provide highly imprecise and most likely under-reported estimates of the numbers of farms operating over 10 ha of land. Evidence of this is provided in Section 2. However, even when utilizing these datasets, as we do for Ghana, Nigeria, Tanzania, and Zambia in Section 3, it is shown that medium-scale farms are accounting for a rising proportion of national farmland and the value of crop production and marketed output. However, in other countries, especially those that are relatively densely populated, the data suggest that the number of medium-scale farms has grown relatively slowly or not at all, but we cannot tell with confidence whether this is a valid conclusion or an artifact of sampling designs that almost certainly under-report relatively large farms.

The causes and consequences of changing farm structure and the rise of medium-scale farms are discussed in Sections 4 and 5. Though the literature remains thin, emerging evidence indicates that medium-scale farms generate mostly positive spillover effects on smallholder farmers. In Section 6, we examine the characteristics of medium-scale farmers and the various pathways to becoming a medium-scale farmer. Section 7 examines how medium-scale farmers are acquiring their land and how these pathways differ from how small-scale farm households tend to acquire land. Section 8 reviews the evidence on changes in land tenure systems and security and how medium-scale farms may be indirectly influencing tenure systems. A summary of the main findings and policy implications of the study are presented in Section 9. In the process, we propose an updated typology of farms that reflects recent changes in the relative importance of different farm categories and sheds light on the heterogeneity found even among smallholder farms. Section 9 also addresses how land tenure security by members of local communities and vulnerable groups in particular may be enhanced even while evolving land institutions are encouraging market-based land transfers and the “commodification” of land in rural Africa.

<sup>1</sup>This paper defines “small-scale farms” as those between zero and five hectares of farmland. Medium-scale farms are defined as farms between 5 and 100 hectares, and large farms those over 100 hectares. These definitions may not correspond exactly to those used by all national governments in the region.

## 2 | DATA AND METHODS

We use data on farm size distributions from two kinds of sources: (i) available national population-based surveys (in Ghana, Rwanda, Nigeria, Tanzania, and Zambia); and (ii) primary data collected in collaboration with local agricultural policy research institutes or universities in Senegal, Nigeria, Zambia, and Malawi. From the first category, data on landholding sizes, area cultivated, and the value of crops produced and marketed by small-scale (0–5 ha) and medium-scale farms (5–100 ha) come from the following sources: the 1999, 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) 2009, 2011, and 2013, implemented by the Tanzania National Bureau of Statistics; the Uganda LSMS surveys of 2006 and 2014, implemented by the Uganda Bureau of Statistics; and the Crop Forecast Surveys, of 2001, 2008, and 2015, implemented by the Zambia Central Statistical Office. Most of these data sets are supported by the World Bank's LSMS unit.

These population-based surveys may be considered appropriate for studying the small-scale sector because historically 90% or more of the farm households in most African countries have been between zero and five hectares. However, population-based data sets such as the 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 3,265 households according to our computations, but only 15 have landholdings over 20 ha. The Uganda LSMS contains 12 farms between 20 and 50 ha and none over 50 ha. The Malawi 2010/11 LSMS contains one farm observation between 10 and 20 ha, one farm between 20 and 50 ha, and none over 50 ha. These surveys obviously do not contain a sufficient sample size of farms over 20 ha to make confident statements about their rate of growth.<sup>2</sup> In Kenya, despite widespread anecdotal evidence that large farms connected to the three Presidential families of Kenya may account for up to 20% 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 ha. 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.

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

Fortunately for our purposes, 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 over-samples 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 definitions (holdings of 0–5, 5–100, and over 100 ha, respectively). To ascertain the potential bias associated with using LSMS data to understand farm size distributions, a comparison of Tanzania's 2008 NPS and 2008 ASCS is presented in

The results in Table 1 show that LSMS and ASCS produce very similar estimates of farmland held and under operation among small-scale farms between 0 and 5 ha; the two surveys produce nearly identical estimates of land under operation. For medium-scale holdings between 5 and 100 ha, 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 ha, 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 utilize LSMS and comparable nation data sets cautiously, understanding that they may represent a lower bound estimate of their share of national farmland, cultivated area, and farm production.

Finally, we draw upon recent surveys of medium-scale farms conducted by the Federal University of Agriculture at Abeokuta in Nigeria, the Tegemeo Institute of Egerton University in Kenya, the Sokoine University in Tanzania, and by the Indaba Agricultural Policy Research Institute in Zambia. These exercises involved the compilation of lists of the full population of 5 to 100 ha farms in selected districts in

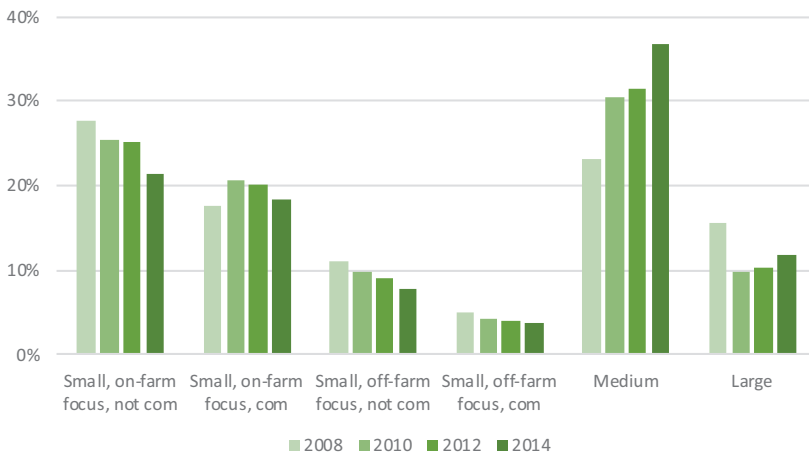
<sup>2</sup>This conclusion is also acknowledged in the World Bank's recent 2018 *Myths and Facts* book relying on the use of LSMS data (Christiansen & Demery, 2018, p. 10).

**TABLE 1** Comparison of farmland owned and land under cultivation in Tanzania, 2008/09 season

	Farm land controlled			Land under operation		
	LSMS	Ag Sample Census Survey	% difference	LSMS	Ag Sample Census Survey	% difference
<b>By holdings of:</b>	<b>Million hectares</b>			<b>Million hectares</b>		
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.

Source. Tanzania National Bureau of Statistics 2008/09 Agricultural Sample Census Survey and 2008/09 National Panel Survey/LSMS.



**FIGURE 1** Distribution of land cultivated by farm category, Tanzania, 2008, 2010, 2012, and 2014 [Color figure can be viewed at wileyonlinelibrary.com] Source. National Panel Survey / LSMS, Tanzanian National Bureau of Statistics, Dar es Salaam.

consultation with local district agricultural offices, national farmer unions, and/or village authorities. The population lists serve two purposes. First, they enabled the generation of 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 sociodemographic 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.

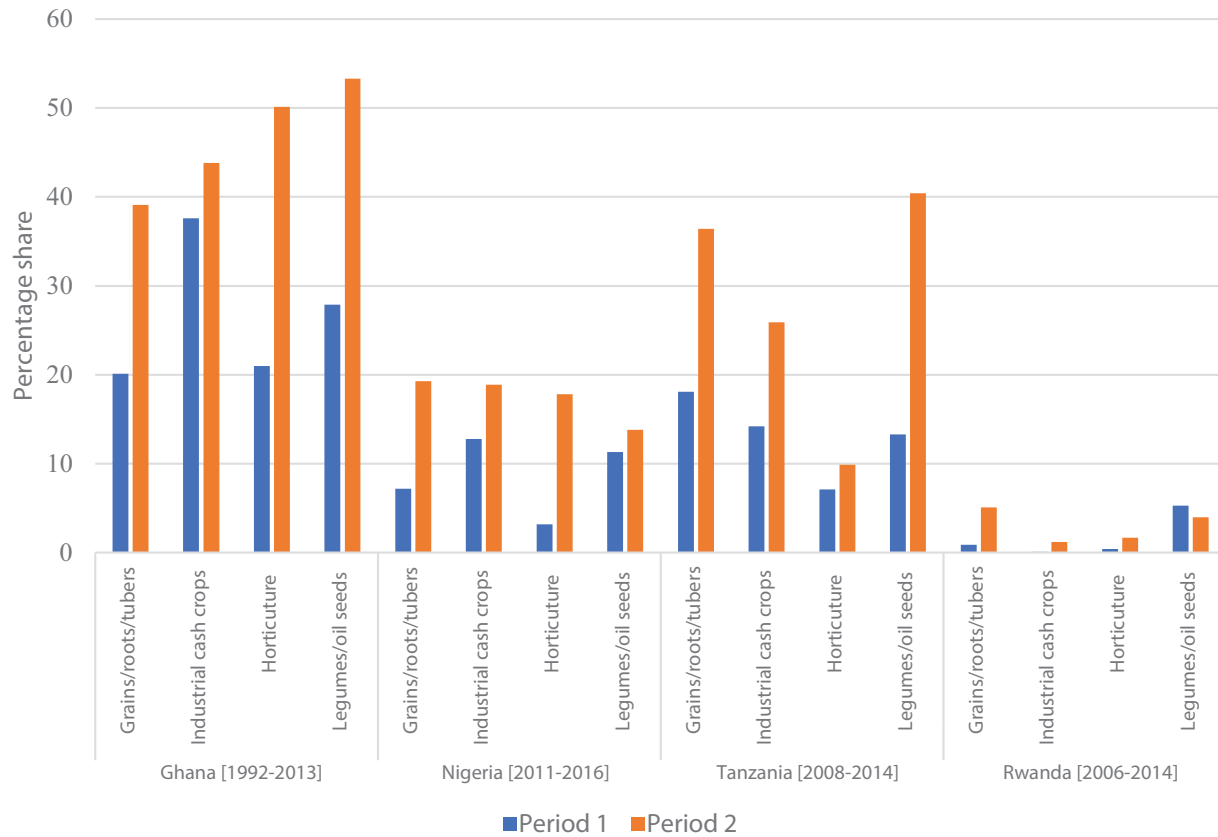
### 3 | CHANGES IN THE DISTRIBUTIONS OF FARM SIZE, CROP PRODUCTION, AND MARKETED OUTPUT

The size distributions of farms in many African countries are rapidly changing. In most of the countries for which LSMS/ISA or similar national rural household surveys exist, and particularly those with substantial potential for cropland expansion, it is no longer true that the vast majority of farmland in Africa is small-scale. The national shares of area under

cultivation, the value of production and marketed crop output on farms under five hectares is generally declining over time with corresponding increases in shares among medium-scale farms (Figures 1 and 2, Tables 2 and 3). In countries with substantial unutilized land, as in Zambia, Tanzania, and parts of Ghana and Nigeria, the share of farm production and marketed output accounted for by farms in the 5–100 ha category is rising quite rapidly. In Ghana, for example, the share of national cropped area under medium-scale farms is close to 50%, and medium-scale farms account for over half of all nationally marketed oilseeds and horticultural crops, even with the caveats noted in Section 2 about the underrepresentation of medium-scale farms.

This trend is not happening everywhere. In densely populated countries such as Kenya, Malawi, Uganda, and Rwanda, land scarcity and high land values are impeding the pace of medium-scale farm acquisitions, and the share of land under medium-scale farms is growing slowly if at all. However, as we have established in Section 2, LSMS data may under-represent medium and large-scale farm holdings, based on comparisons of larger farm censuses and LSMS data from the same year. Therefore, the share of cultivated land, farm production and marketed output accounted for by medium-scale farms as reported in this review are most likely underestimated.

The rise of medium-scale farms has occurred during a period when the rate of agricultural production growth in



**FIGURE 2** Medium-scale (5–100 ha) farms’ share of national value marketed crop output [Color figure can be viewed at wileyonlinelibrary.com]

Source. Computed from national household survey data as described in Section 2. All data sets are considered nationally representative official data collected by national statistical services.

**TABLE 2** Changes in the shares of national crop production value by farm size category

	Countries with relatively sparsely populated areas						Relatively densely populated areas			
	Zambia		Tanzania		Ghana		Nigeria		Uganda	
	% share of national value of crop output									
	1999	2015	2009	2015	1999	2013	2011	2016	2006	2014
0–5 ha	79.6	66.3	82.0	70.7	78.0	56.0	93.9	88.0	84.2	95.3
5–10 ha	13.7	18.9	12.1	17.8	11.8	25.9	5.1	6.8	7.6	3.0
10–20 ha	5.1	12.0	2.1	9.3	6.4	12.3	0.7	4.9	3.3	1.6
20–100 ha	1.4	2.8	2.3	2.1	3.5	5.5	0.3	0.3	4.3	0.1
+ 100 ha	0.0	0.0	1.3	0.1	0.3	0.3	0.1	0.0	0.6	0.0
	100	100	100	100	100	100	100	100	100	100

Source. National household surveys as described in Section 2.

sub-Saharan Africa has been the highest of any region in the world. Sub-Saharan Africa has achieved 4.6% inflation-adjusted annual mean increases in agricultural growth between 2000 and 2016 (World Bank, 2017), roughly double that of the prior three decades. The region’s per capita GDP increased by almost 35% in real terms over this period, doubling in some countries (Barrett, Christiaensen, Sheahan, & Shiferaw, 2017). Poverty rates have declined significantly for the region as a whole since 2000.<sup>1</sup> Nutritional indicators also

show gradual but clear improvement (Masters, Rosenblum, & Alemu, 2018). At the same time, the pace of transformation has been highly uneven across the region.

Given sub-Saharan Africa’s impressive rate of agricultural production growth since 2000, it would be important to understand the extent to which medium-scale farms have contributed to agricultural production growth in these countries. The inflation-adjusted growth rates of agricultural value addition in Tanzania, Zambia, and Ghana between 2001 and 2016

**TABLE 3** Changes in the shares of national marketed crop production value by farm size category

	Relatively sparsely populated areas						Relatively densely populated areas			
	Zambia		Tanzania		Ghana		Nigeria		Uganda	
	% share of national value of marketed crop output									
	2001	2015	2009	2015	1999	2013	2011	2016	2006	2014
0–5 ha	74.2	52.9	80.2	67.1	79.9	56.6	92.2	80.7	77.1	88.9
5–10 ha	15.0	22.6	12.6	22.0	11.7	22.9	6.8	9.5	10.3	7.3
10–20 ha	8.3	19.6	4.0	8.7	5.6	13.1	0.7	9.2	5.4	3.6
20–100 ha	2.5	4.8	2.4	3.0	2.8	7.0	0.2	0.8	6.3	0.2
+ 100 ha	0.1	0.0	0.8	0.1	0.1	0.4	0.2	0.0	0.9	0.0
	100	100	100	100	100	100	100	100	100	100

Source. National household surveys as described in Section 2.

**TABLE 4** Contributions to farm output and cultivated area by farm size category, Tanzania, Zambia, and Ghana

Tanzania	Unit	Farm size category (area cultivated)			National (all farms)
		0–4.99 ha	5–9.99 ha	10 and over	
Change in value of farm output (2014/2015 minus 2008/2009)	Billions of 2015 real Tanzanian shillings	1,756	858	682	3,296
Share of growth in value of farm output (2014/2015 minus 2008/2009), by farm size category		53.3%	26.0%	20.7%	
<b>Zambia</b>		<b>0–4.99 ha</b>	<b>5–9.99 ha</b>	<b>10–20 ha</b>	<b>All farms, 0–20 ha only</b>
Change in value of farm output (2015 minus 2001)	Millions of real 2015 rebased Kwacha	4,014	1,901	1,498	7,413
Share of growth in value of farm output (2015 minus 2001), by farm size category		54.1%	25.6%	20.3%	
<b>Ghana</b>		<b>0–4.99 ha</b>	<b>5–9.99 ha</b>	<b>10 and over</b>	<b>National (all farms)</b>
Change in value of farm output (crop only) (2013 minus 2005)	Millions of real 2013 Ghana Cedis	1,166.64	1,513.47	254.40	2,934.52
Share of growth in value of farm output (2013 minus 2005), by farm size category		39.7%	51.6%	8.7%	

Note. Value of farm output includes both crop and livestock production. The Tanzania surveys are found to underestimate area cultivated of farms 5–20 ha and 20+ ha by roughly 50% (Jayne et al., 2016), so Tanzania figures most likely underestimate the shares of farm output growth. Zambia data considered statistically representative of farms 0–20 ha, so they do not account for the contributions of farm growth and cultivated area of this farm size category.

Source. Computed from national household survey data as described in Section 2.

was 4.35%, 0.61%, and 3.50% per year. Table 4 disaggregates the changes in agricultural production growth based on the available large-scale farm surveys available in each country for two points in time.

The results in Table 4 show that medium-scale farms accounted for 47% of the additional value of farm output produced nationally between 2008/2009 and 2014/2015. Of these medium-scale farms, 26% of the additional value of farm output was contributed by farms cultivating between 5 and 10 ha, whereas 20.7% was contributed by farms over 10 ha (despite being substantially under-reported in this LSMS dataset as noted in Section 2). While small-scale farms cultivating between 0 and 5 ha account for the vast

majority of farms in the country (92% in Tanzania and 90% in Zambia), they accounted for only slightly more than 50% of the additional value of farm production in Tanzania between 2008/2009 and 2014/2015 and in Zambia between 2001 and 2015. In Zambia, note that farms cultivating over 20 ha were not included in the sampling frame – if they were, the share accounted for by small-scale farms would certainly be lower while that of medium-scale farms would be higher. Small-scale farms contributed only 40% of the additional value of farm production in Ghana between 2005 and 2013. Farms cultivating between 5 and 10 ha contributed 51% while farms over 10 ha contributed 8.7% of Ghana's additional farm output between 2005 and 2013. In short, medium-scale



farms contributed over 45% of the farm production growth experienced in each of the three countries over the specified periods, which is particularly noteworthy considering that the shares attributed to farms over 10 ha as reported in Table 4 are likely to be under-reported, and given that farms over 20 ha in Zambia are excluded from the analysis.

## 4 | CAUSES OF CHANGING FARM STRUCTURE

There are four main causes of changing farm size distributions in Africa: the rise of land markets, the recent era of relatively high global food prices, greater agricultural policy reforms, and the actions of farm lobbies.

### 4.1 | The rise of land markets

Rapid rural population growth has transformed settled areas from land-abundant areas where rural-born people would receive land as a birthright and where even migrants from different regions could often easily acquire land to areas of land scarcity where the value of land has skyrocketed in recent years. Land purchase/sales markets are developing rapidly in countries where they were considered illegal not more than a generation ago.

Today, land sales markets constitute a major pathway for the expansion of medium-scale farms. There are several types of land sales markets. In some African countries, the purchase and sale of land is now legal. According to the 2014/2015 LSMS in Tanzania, for example, purchased land accounts for 29.6% of all plots held by farm households and 36.5% of all cultivated land. Qualitative surveys indicate that relatively wealthy rural people as well as urban-based people, and even relatively successful smallholder farmers are buying land in areas of favorable market access conditions from other households who are relocating to urban or more hinterland rural areas (Anseeuw, Jayne, Kachule, & Kotsopoulos, 2016; Knapman et al., 2017; Muyanga et al., 2019). Also common is the privatization and sale of land by traditional authorities. Historically, chiefs and headmen were seen as custodians of unutilized land, allocating it to members of their local communities as their numbers swell, but the rising acquisition of landholdings by non-resident people indicate the possibility that customary land is being “sold” based on willingness to pay criteria. 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 prevail, they are increasingly utilized by wealthy outsiders as a means to acquire land (Knapman et al., 2017). This often results in a transfer of land from customary tenure (under the authority of chiefs or their representatives) to statu-

tory tenure with freehold or long-term lease titles (Knapman et al., 2017). One likely outcome of such trends is that customary lands are being privatized more quickly with less being available as a birthright of future generations of rural-born youth.

### 4.2 | An era of high global food prices

Food prices in Africa rose substantially after the global food price surge of 2007/2008.<sup>3</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>4</sup> The sustained agricultural growth that many African countries have experienced in the recent period of high local and world food prices 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.

### 4.3 | Policy reforms

An under-appreciated contributory factor has been the contentious agricultural market and economy-wide policy reforms undertaken during the 1980s and 1990s. These policy reforms removed major barriers to private trade. The effects of the reforms were mostly dormant until the mid 2000s when world food prices suddenly skyrocketed, enabling thousands of small, medium and large-scale private firms to rapidly respond to profitable incentives, thereby rapidly building up the region’s agri-food systems during this period (Jayne, Mather, & Mghenyi, 2010). Reductions in trade barriers and state control of agricultural markets has enabled domestic food prices to become better aligned with import parity conditions compared with earlier years. Small-, medium-, and large-scale private firms have invested all along agricultural value chains in response to these policy reforms, which are part of the agri-food systems transformations that the region is now experiencing.

### 4.4 | Farm lobbies and political capture

After roughly a decade of intense struggle between African governments and international lenders over the course of agricultural policy between 1985 and 1995, local interests

<sup>3</sup> The international prices of maize, rice, and wheat over the 2006–2018 period, adjusted by two different global deflators (the US GDP deflator and the global Manufacturing Unit Values Index), are on average 49%, 46%, and 39% higher than their inflation-adjusted 1990–2005 averages, based on World Bank Pink Sheet (<https://www.worldbank.org/en/research/commodity-markets>, last accessed July 19, 2019).

<sup>4</sup> Rural land values in favorable market access areas of Tanzania have doubled in real terms between 2009 and 2013, rising more rapidly than wage rates or other inputs into agricultural production (Wineman & Jayne, 2018).



regained control over the policy agenda starting in the early 2000s, often in an environment of nascent multiparty political systems. Parties often adopted populist stances such as offering free inputs and support prices for local farmers to promote food self-sufficiency. 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. Farmer unions in some countries lobby forcefully for a system of agricultural subsidies and land allocation that channel the majority of public expenditures to agriculture to relatively large farms (Binswanger, Deininger, & Feder, 1995). Most national farmer unions in the region support policies that raise food prices (rewarding farms that produce the largest marketable surpluses), 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 disproportionately in the programs. Common rhetoric used to justify this position is that public support should go to “progressive” farmers who view “farming as a business” and have entrepreneurial experience to transform African agriculture. These positions reflect the interests of relatively capitalized “emergent” farmers, and at a minimum suggest the possibility that some of the national farmer unions have been captured by these interests (Sitko & Jayne, 2014).<sup>5</sup> Because investor farmers tend to be more educated and have more extensive social connections with traditional and state authorities, they also tend to have advantages with respect to navigating both customary and statutory land institutions to access land. For these reasons, and 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 medium-scale land acquisitions in the region.

We believe that a small-scale farm-led agricultural transformation strategy could have succeeded, and could still succeed in Africa, as it did in much of Asia, if African governments provide sustained support for smallholders through policies and public expenditures targeted toward them. Ethiopia and Rwanda, for example, appear to be pursuing such a strategy with reasonable success. Yet as the political importance of commercialized medium-scale farmers continues to rise, as it has in many but not all of the countries examined, their interests may increasingly influence the composition and design of

public agricultural budgets and policies, much as large farm interests have in other parts of the world.

## 5 | CONSEQUENCES OF CHANGING FARM STRUCTURE

This is a fairly new area of research and the evidence base remains thin. Based on the few studies undertaken so far, we highlight both positive and potentially negative effects from the rapid acquisition of land by medium-scale farms.

On the positive side, medium-scale farms are pulling in major new private investment in value chains that improve market access conditions for nearby smallholders. For example, farming areas with a high concentration of medium-scale farms attract greater investment by large-scale grain buyers in Kenya, Zambia, and Tanzania (Sitko, Burke, & Jayne, 2018). Small-scale farmers are significantly more likely to sell to large grain trading firms if they are located in districts with a high concentration of medium-scale farms, even after controlling for agro-ecological and market access conditions (Burke, Jayne, & Sitko, 2019). Though the large-scale grain traders are initially attracted to invest in an area by the large marketable surpluses of medium-scale farms, once they establish their buying stations, they improve market access conditions for all farms in the area. Using LSMS data from Tanzania, Van der Westhuisen et al. (2018) find that small-scale farms are much more likely to rent mechanization services in areas with a high concentration of medium-scale farms. Although only 3% of small-scale farms rent tractors in the 21 regions of mainland Tanzania with the lowest concentration of medium-scale farms, 23% of smallholders rent mechanization services in the 5 regions with the highest concentration of medium-scale farms. Mechanization rental services have sprung up in areas with a high concentration of medium-scale farms, catering to their demand for tractor services, which has made it more feasible for small-scale farms to rent tractors, reduce their labor input into farming, and reallocate their labor to higher-return non-farm activities, while still deriving income from farming. Wineman, Jayne, Isinika-Modamba, and Kray (2018) also show important “spillover benefits” whereby the presence of medium-scale farms tends to improve small-scale farmers’ access to agricultural inputs and services. Other studies in this emerging “spillovers” literature tend to find positive synergies in some cases and no clear statistical relationship in others (Ali, Deininger, & Harris, 2019; Lay, Nolte, & Sipangule, 2018; Deininger & Xia, 2016).

Direct comparisons of farm productivity between small-scale and medium-scale farms are scarce because almost all of the existing farm survey datasets from Africa (including LSMS) contain very few observations of farms over 10 ha. New evidence that matches small-scale (0–5 ha) vs.

<sup>5</sup> For example, about 50% of the Zambian government’s agricultural budget goes into subsidy programs benefitting the most privileged 5% of farmers (Jayne, Mather, & Mghenyi, 2010). Similarly, government preoccupation with clearing the way for land market transactions, despite extensive rhetoric to the contrary, is largely focused on trying to create processes whereby large investors can gain access to land (Sitko & Chamberlin, 2016).





medium-scale (5–100 ha) farms in Kenya using relatively large samples shows a distinct advantage to medium-scale farms in three alternative measures of productivity including TFP, net value of agricultural output per hectare, and agricultural labor productivity (Muyanga & Jayne, 2019). The productivity advantage of medium-scale farms were due to differences in technical choice related to mechanization, which substantially reduces labor input per hectare, and from greater intensity of cash input use. Medium-scale farms are also more likely to be early adopters of, and comply with the protocols of, new farm technical innovations and practices.

Evidence to date from Tanzania, Kenya and Nigeria suggests that the cropping patterns of medium-scale farms does not differ greatly from those of small-scale farms (Muyanga & Jayne, 2019; Muyanga et al., 2019; Wineman et al., 2018). However, in most cases, small-scale farms do utilize a higher proportion of their land. Many medium-scale farmers acquired their land relatively recently and state an intention to bring a progressively higher proportion of their land under cultivation over time (Muyanga & Jayne, 2019).

Chamberlin and Jayne (2018) using LSMS data from Tanzania find that districts with a high concentration of farmland under medium-scale farms are associated with significantly higher farm and nonfarm incomes of small-scale and non-farm households. Exploiting inter-district variation in farmland distribution patterns in Tanzania, their study finds that household incomes from farm, agricultural wage, and non-farm sources are positively and significantly associated with the share of land in the district controlled by 5–10 ha farms (after controlling for market access, rainfall, soils, and other local conditions). These positive spillover benefits are smaller and less statistically significant in districts with a relatively high share of farmland controlled by farms over 10 ha in size. Anecdotal interviews of key informants in rural areas suggest that medium-scale farms, particularly those in the 5–20 ha range, share many social and economic ties with small-scale farm households, participate in the same rural institutions, and hence may be more likely to have mutually beneficial economic synergies. By contrast, many large farms are controlled by people of other ethnic backgrounds or reside outside the area, and hence may not share strong social ties in the local community.

Also noteworthy is that the rise of commercialized medium-scale farms is likely to facilitate means by which governments may raise taxes or contributions that can be re-invested into public goods in relevant rural areas. This has yet to occur in many cases, but the surplus production of commercialized medium-scale farms represents in principle a future opportunity for Ministries of Finance and local communities to raise revenues for reinvestment in local public goods.

Although this nascent literature requires additional evidence before robust conclusions can be made, initial evidence

indicates that the rise of medium-scale farms may be contributing strongly to the development of agricultural output and factor markets, investment incentives by small-, medium-, and large-scale agribusiness firms, and general equilibrium multiplier effects associated with the region's dynamism over the past decade (Jayne, Chamberlin, & Benfica, 2018). As described in Section 4, causality between economic dynamism and the rise of commercialized medium-scale farms clearly runs in both directions.

However, there are some warning signs as well. The rising acquisition of land by outside investors certainly reduces the stock of land under customary tenure that will be accessible to current and future generations of local people. If traditional authorities are selling off land to outside investors, it will raise the price of land. Young people from these communities will find access more difficult, which will increase their likelihood of exiting farming and/or migrating out of the area (Bezu & Holden, 2014; Chimhowu & Woodhouse, 2006; Knapman et al., 2017; Kocec, Ghebru, Holtemeyer, Mueller, & Schmidt, 2018). Ghebru and Girmachew (2017), Ghebru and Lambrecht (2017), and Ghebru and Girmachew (2019) indicate that smallholders' perceived tenure security in Ghana, Nigeria, and Mozambique is negatively correlated with the degree of local land market activity. Households residing in communities with more vibrant land markets perceive greater risk of losing land due to private dispute or expropriation by the government. As the customary land tenure system comes under greater stress as land becomes increasingly commodified, the protection that traditional systems have historically provided to safeguard individual rights to land are starting to break down. Badiane (2019) noted that one of the major historical differences between poor rural households in Africa and Asia was that at least most of those in Africa had some rights to land. Unfortunately, in recent years, researchers are detecting increasing signs of rural landlessness in much of Africa too (e.g., Mueller & Chan, 2015).

It would be oversimplifying matters to conclude that medium-scale investor farmers are the main source of tenure insecurity for local rural people. The empirical evidences show that members of the local community, often family members, are a major source of land insecurity of indigenous rural people. Ali, Deininger, and Goldstein (2011), Lawry et al. (2014), and Ghebru and Girmachew's (2019) work on land tenure systems indicate that the interests of vulnerable groups such as women and youth will often require special interventions in areas where land markets are developing rapidly and that these interventions will need to be context specific and hence vary by location.

Therefore, the development of land purchase/sale markets is part of more wholesale changes in social systems, in some ways uprooting the traditional social fabric and creating new, new power structures. The rise of land markets is creating a new class of landless workers in Africa, who sell their land



informally to others, and become dependent on the local non-farm economy for their livelihoods (Mueller & Chan, 2015). These land purchase market developments produce winners and losers in the short run, and the evidence is not fully clear whether the short-run losers become winners in the long run through processes of economic transformation and growth. Policy makers will need guidance on how to minimize these hardships – protecting those who are most vulnerable as the processes of economic transformation gradually raise living standards for the majority of the population.

## 6 | “STEPPING UP” VS. “STEPPING IN”: CHARACTERISTICS OF MEDIUM-SCALE FARMERS?

Studies were conducted in Zambia, Kenya, Ghana, Nigeria, and Malawi to understand the characteristics of these medium-scale farms and how they became medium-scale farms (Anseeuw et al., 2016; Chapoto, Mabiso, & Bonsu, 2013; Jayne et al., 2016; Muyanga et al., 2019). We were particularly interested in understanding the extent to which current medium-scale farms started out as small-scale farms, acquired more land and expanded their farm operations (“stepping up”) or were formerly primarily engaged in non-farm jobs, invested in land and began farming either as an owner–operator or by hiring a farm manager to run the farm (“stepping into” medium-scale farming). We highlight three insights from these studies.

The first few studies of medium-scale farmers (covering recall periods between 2005 and 2013 and summarized in Jayne et al., 2016) indicated that fewer than 25% of them started out as small-scale farmers who were primarily engaged in farming for their livelihoods and who successfully expanded their operations into medium-scale status. Ghana was the lone exception to this, where the majority of MS farms did start out as small-scale farms (Chapoto et al., 2013). In Zambia, Kenya, and Tanzania, the majority of medium-scale farmers were initially engaged primarily in non-farm activities; they used their savings to invest in relatively large landholdings to begin farming or expand their farming operations. As shown in Table 5, roughly 60% of randomly sampled medium-scale farms in four districts of Zambia and Kenya “stepped in” to medium-scale farming using revenues from nonfarm sources to buy land and start farming. Many of these farmers were relatively wealthy or privileged rural people (civil servants, rural businesspeople, extension agents, religious leaders, traditional headmen or chiefs, etc.) or urban-based people. Emergent farmers who reside in urban areas and hire managers to run their farms have become common enough in the region that the term “telephone farmers” has emerged to describe them. The urban-based residences of

many medium-scale farms is reinforced by data in nationally representative Demographic and Health Surveys (DHS), which ask questions of both rural and urban households about whether they own land and if so, how much land. As reported in Table 6, urban-based individuals control a significant proportion of total national land in the five African countries examined, and in almost all cases, the proportion of land owned by urban people has increased between the first and most recent survey. For example, in Ghana, the proportion of national land owned by urban residents increased from 26.8% to 31.9% between 2008 and 2014. In Kenya and Zambia, urban-based individuals and families control close to one-third of all national land controlled by individuals and families. In Malawi, by contrast, the share of national land controlled by urban households was only 3% in 2004, and it rose only to 6.5% by 2010. However, taken together, it seems that an important segment of farms in the 5–100 ha category were owned by people who invested into agriculture using revenues from non-farm employment, acquiring land from local authorities or from increasingly active and sanctioned land markets.

We hypothesize that the importance of non-farm investment into medium-scale farming in the 2005–2013 period was at least partially driven by the unusually high world food prices that prevailed during this time. Many wealthy people in both rural and urban areas found that food production could be an attractive investment, especially in areas where traditional authorities were willing to allocate relatively large tracts of customary land at low cost to the investor. A sizeable proportion of medium-scale farms – particularly those who acquired land from non-farm income sources – started their farms after 2005 when world food prices rose dramatically. In Zambia, for example, 63% of these farms were started after 2005. Hence, as might have been expected, substantial resources appeared to flow into agriculture from outside the sector, not only by international investors but by local investors as well (Jayne et al., 2016).

However, more recent surveys indicate that the pace of land investment by urban and rural elites may have slowed in recent years. This might have been anticipated as world food prices, while still relatively high compared to the 1990s and early 2000s, have declined from their unusually high levels between 2006 and 2012, and as land prices in favorable farming areas have continued to rise due to population growth and commercial interest. Recent studies in Zambia, Senegal, and Nigeria indicate that perhaps 60% of medium-scale farmers surveyed in 2017 and 2018 have “stepped up” from small-scale status. For example, the 2018 survey of medium-scale farms in Ogun and Kaduna States by Muyanga et al. (2019) shows that “stepping up” from small-scale to medium-scale farming as a pathway to agricultural commercialization in Nigeria, was more predominant than directly “stepping in” into medium scale farming from nonfarm activities (Table 5). The

**TABLE 5** Characteristics of medium-scale farmers: “Stepping up” vs. “Stepping in”

	Nigeria, 2018		Kenya, 2013		Zambia, 2013	
	Primary mode of entry into medium-scale farming (i.e., operating between 5 and 100 ha)					
	Stepping up: Growth from small-scale farming (n = 476)	Stepping in: Acquisition of land from non-farm employment (n = 534)	Stepping up: Growth from small-scale farming (n = 120)	Stepping in: Acquisition of land from non-farm employment (n = 180)	Stepping up: Growth from small-scale farming (n = 118)	Stepping in: Acquisition of land from non-farm employment (n = 164)
% of cases	47.1	52.9	40	60	42	58
% men	95.4	98.1	82.5	80.0	92.9	91.4
Year of birth	1974	1963	1945	1947	1966	1960
Years of education of head	7.0	8.0	7.5	12.7	8.2	11.0
Have held a job other than as a farmer (%)	19.2	88.9	17.5	83.3	32.9	100.0
Formerly or currently employed by the public sector (%)	13.5	53.3	12.5	56.7	5.8	59.6
Initial landholding size when started farming (ha)	4.0	11.7	14.0	22.6	28.8	106.6
Current landholding size (ha)	7.8	25.6	32.7	50.1	38.2	74.9
% of land currently under cultivation	78.8	62.3	54.1	46.6	46.9	24.7
Decade when land was acquired by individual:						
1979 or earlier (%)	32.1	43	24	10.6	6.2	
1980–1989 (%)		20	20	14.8	7.4	
1990–2005 (%)	26.7	14	32	32.2	23.8	
2005 or later (%)	41.2	23	25	42.0	63.4	

Notes: The “stepping-in” category includes individuals who purchased over 5 ha of land to initiate their farming activities. Source: Expanded from Jayne et al. (2016) to include 2018 data from Nigeria as reported in Muyanga et al. (2019).

**TABLE 6** Extent of urban household control of national agricultural land

	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 national landholdings held by urban households	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 held by urban households	36.9	42.7	34.3	41.2	1.2	7.6	17.2	78.9	21.7	29.3

Notes. For Zambia, Malawi, and Kenya, landholdings over 95 ha were reclassified as 95 ha. For Ghana, landholdings over 95 acres were reclassified as 95 acres (38 ha). These caps on the reported landholding size may result in underestimates of the land controlled by urban households.

Source. Demographic and Health Surveys, <https://www.dhsprogram.com/Data/>.

study of medium-scale farmers in Senegal by Bourgoin et al. (in press) similarly shows that the majority of randomly surveyed medium-scale farms started out as small-scale farmers who utilized land markets and other forms of land acquisition to expand their farming operations. The Senegal case study does show major investment by people primarily involved in non-farm businesses in areas close to major urban centers such as Niayes, but in most other areas, most medium-scale farms started out as small-scale farms primarily engaged in farming. In Nigeria, land accessibility and mechanization rental markets were found to be the most important factors that enabled small-scale farms to “step up” into medium-scale status, pointing to the importance of land and mechanization markets for the “stepping up” process. These results from Nigeria, Senegal, and Zambia point to a small but growing class of entrepreneurial commercialized African farmers who are using proceeds from farming to expand their operations into the 5–20 ha category. The growing dynamism and upward mobility among some segments of smallholder farmers is associated both spatially and temporally with increasingly active land, labor, agricultural input, output, and finance markets, which is making it easier for individuals to overcome binding constraints on farmland expansion and productivity.

However, even the medium-scale farmers who “stepped up” from small-scale might be considered atypical of most small-scale farm households, given that their initial landholding size at the time they started farming was 4.0 ha in Nigeria, 14 ha in Kenya, and 29 ha in Zambia (Table 5). They may have been farming less than five hectares when they started out, but very few small-scale farm households possess landholdings of that size in Kenya or Zambia, pointing to rather unique circumstances of the small-scale farms who tend to “step-up” into medium-scale status.

Although these recent studies indicate that half or more of the current MS farms were formerly small-scale farmers, an exceedingly small fraction of small-scale farm households ever become medium-scale farmers. The probability that a small-scale farmer (0–5 ha cultivated) will become a medium-scale farmer (5–100 ha cultivated) is on average about 4–5%. Many more small-scale farms are expected to exit partially or

fully out of farming than to become medium-scale farmers in the years to come. But much will still depend on government policies and the composition of their spending on agriculture.

## 7 | HOW ARE MEDIUM- AND SMALL-SCALE FARMERS ACQUIRING THEIR LAND?

Medium-scale farms are growing most rapidly in areas where land is still relatively cheap (e.g., Zambia, Tanzania, northern Ghana) and least so in areas where additional land is scarce and land prices are highest (Rwanda, Kenya, Southern Ghana). Small-scale and medium-scale farm households acquire land via four main forms: (i) inheritance; (ii) renting land; (iii) obtaining land from traditional authorities, either allocated for free as a social right, or via purchase or long-term lease; and (iv) purchasing land or obtaining a long-term lease from another owner/household.

*Inheritance:* Historically, inheritance has been a major form of land access for rural-born people. However, inheritance is declining in most countries, especially those with already high population densities. In the 2014/2015 Tanzania LSMS survey, for example, inheritance accounts for 33.2% of all plots and 38.3% of all area under cultivation. Inheritance accounts for 40% of plots in Ethiopia, 14% in Nigeria, 70% in Niger, and 62% in Uganda. Because of rising life expectancies in sub-Saharan Africa – from 48 years in 1980 to 60 years in 2015 – rural youth will need to wait longer to inherit land (Jayne et al., 2014b). Continued subdivision and fragmentation will continue to limit the amount of land to be inherited by today’s rural youth (Yamano, Place, Nyangena, Wanjiku, & Otsuka, 2009). For these reasons, it is increasingly unlikely that rural African youth will inherit land in the future. For those who do, they tend to inherit much smaller parcels than in the past and at a later stage in their lives. Lack of inheritance options is a major reason for youth outmigration (Holden & Bezu, 2014; Koec et al., 2018; Muyanga et al., 2019).

*Land rental markets:* Most of the LSMS surveys indicate that rural household participation in land rental

**TABLE 7** Changes in the concentration of farmland ownership

	Period	Movement in Gini coefficient
Ghana (cultivated area) (GLSS)	1992 → 2013	0.54 → 0.69
Kenya (cultivated area) (KIHBS)	1994 → 2006	0.51 → 0.55
Tanzania (landholdings) (LSMS)	2008 → 2012	0.63 → 0.69
Tanzania (area controlled) (ASCS)	2008	0.89
Zambia (landholding) (CFS)	2001 → 2012	0.42 → 0.49

Source. Computed from National Household Survey data as described in Section 2. All data sets are considered nationally representative official data collected by national statistical services.

markets is rising. Most studies of land rental markets indicate that they are welfare-enhancing, by transferring land from labor-deficit, land-rich households to land-constrained households with available labor to work the land (Chamberlin & Ricker-Gilbert, 2016; Deininger, Savastano, & Xia, 2017).

*Allocation of land by traditional authorities:* In some areas, allocation of new land is not possible because all land under customary tenure has already been allocated. In areas where significant amounts of unallocated land remain under customary tenure systems, the rise of investor farmers is competing with future generations of rural youth for land (Jayne et al., 2016). This is where land registration and certification may provide the greatest benefits in terms of securing access to land for locally-born rural people (Ghebre and Lambrecht, 2017; Gebhre and Girmachew, 2017).

*Land markets for purchase and long-term lease:* Because of growing scarcity, land is increasingly recognized as having value. Over the past 20 years, land purchase markets have sprung up rapidly, even in customary tenure areas where it has traditionally been considered taboo (Chimhowu & Woodhouse, 2006; Sitko & Chamberlin, 2016; Woodhouse, 2003). Purchase and long-term leases provide better leverage for the farmer to undertake permanent improvement on the land such as irrigation and soil conditioning as compared to short-term tenancy that is not amenable to land development and conditioning. The rising importance of land purchase markets may therefore be a source of productivity improvement for those able to secure long-term rights to land. Moreover, growing participation in legal and clandestine land purchase/sale markets are a major source of rising land prices in parts of rural Africa. Using LSMS data from Tanzania, Wineman and Jayne (2018) identify the following factors as correlates of land values in Tanzania: the net value of crop output per acre, soil quality, and market access conditions – all proxies for a region's agricultural commercialization potential. The growth of small and medium-sized towns are improving market access conditions in farming areas once considered remote, thereby raising land values in such areas. Because of all these land allocation processes, farmland ownership is becoming more concentrated, as measured by the Gini coefficient of owned land (Table 7).

## 8 | CHANGES IN LAND TENURE SYSTEMS AND SECURITY

Since 1980s, researchers have documented the changing dynamics between customary and statutory tenure systems wrought by informal land sales.<sup>6</sup> The processes by which investor farmers have acquired customary land has been highly variable, but early observers noted that a common motivation of such acquisitions has been to undertake commercialized crop production.<sup>7</sup> However, the formal legal status of customary tenure and the scale of these interactions give the contemporary urban investor farmer phenomenon unique features. Although in prior decades almost all SSA resisted conferring legal state recognition of customary tenure systems, since the 1990s the trend has been towards formal recognition of customary tenure. Until the 1990s most SSA countries had an official or unofficial policy to extinguish customary tenure by promoting individual titling. These efforts generally failed because of titling costs and the striking resilience of customary tenure systems. Meanwhile, informal transfers in accordance with customary norms, including to investor farmers, accelerated especially during the past decade of relatively high world food prices (Chimhowu & Woodhouse 2006; Lawry et al., 2014).

With the advent of formal recognition of customary tenure, investor farmers must obtain otherwise customary land through a combination of familial or personal connections and quasi-legal documentation. In many SSA countries, transfers of customary land are strictly controlled, at least on paper. The informal or vernacular land market responds to this regulatory burden by adapting available formal legal instruments to secure the transfer, such as reassigning significant amounts of land under a nebulous third tenure category, neither customary nor statutory. For example, a significant amount of land in Liberia is under "Tribal Certificates." Under the now repealed Public Lands Law, Tribal Certificates were issued as part of the first steps in transferring land from customary tenure to private individualized

<sup>6</sup> USAID Country Profiles of Land Tenure, 1986; Is Indigenous Tenure A Development Constraint?, Bruce, 1986.

<sup>7</sup> Ibid.



ownership (Stevens, 2014). The onerous statutory process means in practice most acquisitions stopped at the Tribal Certificate, which has become a *de facto* deed of ownership for many (Ibid). In some parts of Liberia, Tribal Certificates comprise as much as 50% of the land area.<sup>8</sup> Although more research is needed, Tribal Certificates can cover hundreds, or even thousands, of acres, and in at least some cases are used to secure farms with cash crops and for high value land in proximity to cities and major transit routes. Similar approaches have been pursued in other African countries to make it legal for governments or traditional authorities to sell of land to investors (Boone, 2014).

Given the scale of the acquisitions, one question is how investor farmers are viewed by those in customary communities – as sources of economic dynamism and employment or as exploiter? Historically, the nature of land conflict in SSA centers on dynamics between *autochthonous* members of a community (i.e., those with a real or mythic link to a community's original inhabitants or settlers) and strangers, or newcomers (Boone, 2014). As with emergent investor farmers, strangers have been attracted to certain lands because of the potential for commercial crops (e.g. cocoa in Ghana and Cote d'Ivoire; rice in Tanzania; maize in Zambia). Conflicts with long-established customary communities would invariably follow. However, as Boone argues, whether the conflicts remained localized or impacted, security at the national level depended on whether the central government consistently favored autochthonous communities or the stranger, newcomers. An open question is how the emergent investor farmer phenomenon maps onto these well-documented dynamics across SSA. Will African investor farmers be regarded as strangers or not depending on the extent they rely on personal and familial connections to acquire land vs. outright purchase from traditional authorities? Whom will SSA governments favor in a context of rising land scarcity and palpable tenure insecurity? One the one hand, many SSA governments embrace, to greater or lesser degrees, the need to respect and protect customary land rights. On the other hand, investor farmers represent an opportunity for significant gains in crop production and economic growth, but perhaps at the expense of customary tenure holders.

In rural areas of favorable market access and commercialization potential (e.g. Zambia's Copperbelt), investor farmers may represent a significant source of tenure insecurity for customary landholders as they leverage their connections with traditional leaders and state government to wrest control of customary land (Huntington, Stickler, & Stevens, under review). In other areas less attractive to investor farmers, the main sources of tenure insecurity tend to be internal to communities. For example, in relatively remote areas of Zambia's Eastern Province, tenure is relatively secure

(Huntington et al., under review), with only 20% of respondents reporting that encroachment on their land is likely and most with relatives and neighbors within the village posing the most important threat. Further, households reported significant concerns about land reallocation by chiefs and village headmen. This reallocation appears to be motivated not primarily by demand for land from elite external actors, but when another member of the village or a family member needs land to farm, especially if the plot of land in question is not under cultivation at the time of reallocation.

Evidence to date indeed points to some degree of displacement of indigenous small-scale farm households in areas of favorable commercial potential. There is little evidence of displacement in more remote areas, primarily because relatively few investor farmers are locating in such areas. Based on their analysis of six household datasets collected across rural farming areas of Ethiopia, Guinea, Liberia, and Zambia, Stickler, Huntington, and Ewing (under review) find that a clear majority of respondents, most of whom possess no documentation of their land rights, do not perceive a significant risk of land appropriation by either internal or external actors.<sup>9</sup> This is an important finding, since many land registration policies are based on the premise that unregistered rights are inherently insecure. Still, significant minorities in Liberia and Zambia (10–30%) reported that the land they currently possess could be appropriated by internal or external actors in the near future (1–5 years).

Across all datasets, female-headed households were significantly more likely to report a risk of internal appropriation than male-headed households were. No such differences were found for risk of land appropriation from external sources; in fact, in two areas of Ethiopia and Zambia, male-headed households were more likely to report external sources of land insecurity. The greatest threat to tenure security also differed across country datasets, ranging from threats within the community to those deriving from outside authorities or investors. Respondents in Guinea reported family members as the most likely threat to their tenure security (9% of at-risk plots), whereas the largest proportion of respondents in Liberia (23%) feared appropriation by neighbors. By contrast, farmers in the Chipata District of eastern Zambia indicated local authorities were the greatest threat (23% of fields). Only in the primarily pastoral region of Afar in northern Ethiopia did outside investors rank as the largest threat, albeit still relatively small (6% of respondents; Stickler et al., under review).

<sup>9</sup> Although the response categories were standardized within datasets and grouped into standard categories across datasets, we note that respondents may nevertheless have reported threats differently according to their perceptions or interests. For example, an urban family member could be reported as either a family member (internal threat) or an urban elite/investor (external threat).

<sup>8</sup> This data was collected by USAID's Land Tenure Office.



In contrast, very few respondents (1–2%) in any dataset reported having actually lost land to involuntary reallocation, and land conflict is reportedly relatively rare, ranging from 19% of households situated near to the town of Chipata in Zambia to just 1% in Guinea and Zambia's remote Luangwa Valley (Stickler et al., under review). Boundary disputes are reportedly the most common kind of land conflict across all study sites, suggesting that some form of boundary clarification and/or recording process could strengthen tenure security. There were no significant differences between female- and male-headed households with respect to past experience of land conflict.

A number of recent studies suggest that customary tenure systems, which confer undocumented rights to users, provide a greater degree of tenure security than previously thought (Childress, Spievack, Varela, & Ameyaw, 2018; Lawry et al., 2014; Stickler et al., under review). It is therefore important to consider the effectiveness of alternative types of interventions to register land rights with respect to impacts on (i) perceptions of tenure security, (ii) long- and short-term productivity-enhancing investments; (iii) land productivity, and (iv) youth behavior, including decisions to migrate and/or pursue farming. Lawry et al. (2014) stress that attempts to implement a new tenure system may not necessarily produce the intended benefits of improved tenure security – local context and the performance of existing land institutions are decisive. It is generally accepted that interventions to register individual farmland rights in Africa through private, freehold titles have failed may have decreased tenure security in cases where formal land administration systems proved less capable than customary systems of protecting rights (Atwood, 1990; Carter & Wiebe, 1990; Lawry et al., 2014; Migot-Adholla et al. 1994; Place, 2009). There is also evidence suggesting that individual land titling may have had particularly negative impacts on the rights of secondary and vulnerable land users, such as women and the poor (Meinzen-Dick & Mwangi, 2008). However, in other cases, formalization of land rights, e.g., through certificates, has improved tenure security and land-based investments on affected plots (Goldstein et al., 2015; Holden et al., 2009; Melesse & Bulte, 2015). In Burkina Faso, a rural land governance pilot involving participatory land use planning, the development of community land use charters, and capacity building for dispute resolution reduced the predicted probability of serious land conflicts by more than half (56%) and of severe land conflicts by 96% (Linkow, 2018). These findings are significant given that earlier research suggested that high levels of perceived concern about land conflicts in Burkina Faso was associated with a reduction in agricultural productivity of over 40% (Linkow, 2016). Similarly, a randomized control trial (RCT) in Zambia found that beneficiaries of a pilot to map and register customary land rights and strengthen customary land governance institutions felt their fields are now more

secure from reallocation or unauthorized appropriation by both internal and external actors (Huntington et al., under review).

On the question whether land security interventions have increased short- and long-term productivity-enhancing investments and agricultural productivity in Africa, the evidence is generally in support. For example, an RCT in Benin found that the first stage of a government intervention to map and register customary land rights increased beneficiary investment in perennial cash crops and trees by roughly 40% and increased fallowing by female-headed households (Goldstein et al., 2015). Similarly, Ethiopia's program to map and register use rights to farmland parcels increased investments in trees and soil conservation structures and led to productivity increases of 35–45% (Holden et al., 2009; Melesse & Bulte 2015), whereas Rwanda's pilot farmland use rights registration program led to 10 percentage point increase in beneficiaries' investment in soil conservation and a 19 percentage point increase for females (Ali et al., 2011). In Zambia, early RCT evidence finds that customary land registration increased investment in long-term productivity-enhancing practices by both the average beneficiary household (e.g., planting basins increased 7% and manure increased 6%) and by vulnerable subgroups, including households headed by youth and elders, as well as poor and land-constrained households (Huntington et al., under review).

The evidence on the impact of different land interventions on land rental markets is somewhat mixed. Research on Ethiopia's farmland certification program also found that the program increased land rental market activity, including for women, suggesting that landholders felt more confident in their ability to uphold their rights to rented out land (Holden et al., 2009). Likewise, in Zambia, beneficiaries of customary land registration were 1.67 times more likely to report borrowing or renting-in land compared to those in the control group (Huntington et al., under review). However, in Benin, Goldstein et al. (2015) found a 1.6 percentage point decline in the proportion of parcels rented or sharecropped out in villages benefiting from the first phase of customary land registration. The authors hypothesize this finding indicate landowners may have reclaimed parcels they had previously rented or shared-cropped out and/or delayed land transactions to assert their land rights prior to the issuance of land certificates in the next phase.

There is very limited evidence on the impact of land interventions on land sales markets, which may be at least partly explained by the fact that many countries in Africa only recognize use rights to farming parcels and continue to prohibit or heavily restrict land sales. Nonetheless, evidence from Rwanda's pilot land registration program found that land market activity actually declined, suggesting that the risk of distress sales leading to landlessness may be overestimated (Ali et al., 2011).



## 9 | POLICY IMPLICATIONS

Medium-scale farms have become a major force in many African countries' agricultural sectors. Since 2000, the amount of agricultural produce that these farms contribute to countries' national food supplies has risen rapidly. In some countries, like Tanzania and Zambia, medium-sized farms now account for roughly 40% of the country's marketed agricultural produce. This is not uniformly true across Africa. In land-constrained, densely populated areas like Kenya and Rwanda, small-scale farms still account for most of the agricultural output. Medium-scale farms are on the rise mainly where there is substantial, undeveloped land.

While much remains unknown and the story is still unfolding, we believe that medium-scale farms are an important driver of rural transformation in much of Africa – with mostly positive results. The prolonged surge in global food prices starting in 2006 ushered in major and much publicized investment in African farmland by foreign investors. What happened largely under the radar were huge farmland investments by African professionals, entrepreneurs, civil servants, retirees, augmented by millions of relatively successful small-scale farmers who expanded into the lower-end of the medium-scale farm category (operating from 5 to 20 ha). In Ghana, Zambia, Tanzania, and Kenya, the amount of land acquired by these medium-scale African farmers since 2000 has far exceeded the amount acquired by foreign investors (Jayne et al., 2014a).

Medium-scale farmers are a diverse group. Many are relatively wealthy and influential, often professionals, entrepreneurs, or retired civil servants. Many accumulated wealth from nonfarm jobs, invested in land and became either part-time or full time farmers. Many are based in rural areas and have political or social influence with local traditional authorities. Others are urban “telephone farmers” who retain jobs in the cities, hire managers to attend to their farms and occasionally visit on weekends. In more recent years, since investor interest in agriculture may have subsided somewhat as food prices have subsided from their 2006–2012 high, the composition of entry into medium-scale farming appears to have shifted, with most of them being formerly small-scale farm households who successfully expanded their operations. The increasing dynamism of agricultural land, labor, finance, and agro-input markets for mechanization and inputs may be supporting the aspirations of entrepreneurial smallholder farmers to successfully expand their farming operations. In the study of medium-scale farms in Ogun and Kaduna States by Muyanga et al. (2019) for example, roughly 60% of those interviewed stated that they were formerly primarily engaged as smallholder farmers who were able to save from their farm sales to rent, buy or lease new land to expand their operations into medium-scale status. However, although the majority of medium-scale farms may have formerly been

small-scale farms, only a very small proportion of currently small-scale farmers will ever step-up into medium-scale operations. The vast majority of small-scale farm households will remain small-scale and their share of the total population will dwindle over time as the majority of their children increasingly move into off-farm sources of employment.

Medium-scale farmers bring new sources of capital and know-how to African agriculture. They have in some countries become a politically powerful group that are well represented in farm lobbies and national agricultural strategies. They have solidified African governments' commitments to support agriculture. They get their land from traditional chiefs or by purchasing land from others, including small-scale farm households. Displaced smallholders, especially young people, tend to move off farm in search of other sources of employment.

We identified four reasons for the recent growth of African medium-scale farms. First, rapid population growth, urbanization, and rising incomes have contributed to massive growth in demand for food in African countries. Africans with the resources to respond to this demand are doing so. Many Africans with money and resources found farming to be a lucrative investment opportunity – especially during this sustained period of high global food prices since the mid 2000s. Second, policy reforms in the 1990s removed major barriers to private trade and improved the conditions for private investment in African agri-food systems. One example of this was the removal of restrictions on private movement of food commodities across district borders. The effects of these reforms exploded after world food prices suddenly skyrocketed. They enabled thousands of small, medium and large-scale private firms to rapidly respond to profitable incentives. Third, as land became more highly valued in response to growing rural population density and land scarcity, both formal and informal land markets have developed, making it possible for individuals with money and resources to acquire land. Fourth, medium-scale “emergent” farmers have become a powerful political force in many African countries with growing influence over government agricultural and land policies.

With the rise of the medium-scale farms, legitimate concerns have been raised whether their land acquisitions are marginalizing small-scale farmers. The evidence to date is somewhat mixed. Medium-scale farms are clearly providing access to markets and services for nearby smallholder farms. Medium-scale farms have attracted tractor rental providers, who now provide mechanization services to smallholders. This allows them to farm their land with much less labor input, freeing up opportunities to work in off-farm pursuits. Large trading firms have established buying depots in areas with a high concentration of medium-scale farms, thereby improving access to output markets for smallholders too (Sitko et al., 2018). We also found that the medium-scale farms inject cash





into the local economy through their expenditures, stimulating off-farm employment opportunities for many rural people who were formerly dependent on subsistence farming (Chamberlin & Jayne, 2018). Medium-scale farms have also contributed a significant portion of the additional growth in agricultural output in selected countries where comparable nationally representative data is available.

## 9.1 | Implications for agricultural policies

A major policy question for African governments and international development partners concerns the future role of smallholder farms in Africa. The dynamic role of medium-scale farms does not reduce the importance of agricultural ministries maintaining a clear commitment to supporting smallholder farms as a vehicle to accelerate agricultural and economic transformation with poverty reduction. The evidence presented earlier indicates that where competition for land is not intense, new investment in medium-scale farms can attract private sector investments in input and output markets that improve market access conditions and commercialized potential of small-scale farms. There appear to be strong synergies between small and relatively large farms in such areas, and therefore questions of “either/or” might be somewhat misplaced.

However, in densely populated areas where small-scale farms predominate and where there remains limited additional land for area expansion, the priority is clear: focus on promoting the productive potential of small farms, realizing that over time success in this endeavor will lead to progressive movements of individuals and households out of farming and into off-farm jobs as part of the structural transformation process. In short, a successful smallholder-led agricultural strategy will result in a declining share of the labor force in farming.

Are there examples of successful smallholder-led agricultural growth? Possibly Ethiopia comes closest to this. The country has registered 6.0% real average annual agricultural production growth from 2000 to 2015 (World Bank Development Indicators, last accessed November 2018), and it is largely a smallholder-led growth story. This was made possible by strong government support for smallholder farming, including improved infrastructure, agricultural R&D, extension support, diverse farmer support services such as soil testing. Other key ingredients of an effective smallholder-led strategy include a hospitable environment for private sector investment and competition (which might have enabled Ethiopia to progress even faster).

Our view about the role of medium-scale farms is that they should be allowed to develop under a land tenure policy that does not conflict with land tenure security of indigenous rural people or foreclose area expansion opportunities for small-scale farm households. They appear to be a source of rural dynamism as long as they are not displacing indigenous

rural people in the process. Land registration and certification procedures – in sync with customary social norms and institutions – will be needed to provide such protection (Holden et al., 2009; Lawry et al., 2014; Huntington et al., under review).

We conclude with an updated “typology of African farms,” arguing that old perceptions of unimodal smallholder-based agricultural systems are increasingly obsolete:

*Group 1: Traditional semi-subsistence farm households.* Small-scale 0–5 ha, primarily in semisubsistence farming, devoting most of their labor to farming because of limited off farm opportunities, low levels of education, and highly constrained productive assets. They remain close to or below poverty line. Up until 1990 or so, this group constituted the vast majority of farm households in sub-Saharan Africa. They are still the majority in many African countries and their numbers continue to grow, albeit slowly, because the children of these households are rapidly getting out of farming and entering into off-farm employment. In areas experiencing sustained economic dynamism, this group will continue to decline slowly as a proportion of the population over time. This group constitutes 60–70% of the rural population in most rural household surveys and this share has clearly declined over time in most countries.

*Group 2: Relatively commercialized and productive smallholder farm households.* Small-scale 0–5 ha farms, with much greater access to productive assets and therefore higher levels of productivity. They are contributing to rural transformation, and are better off than Group 1 because they possess education and entrepreneurial skills that enable them to devote some of their labor time to viable off-farm forms of employment. This allows Group 2 to diversify and increase their incomes, and effectively capitalize their farm operations compared to Group 1. Some are relatively productive and well above the poverty line; some of them may eventually “step up” to Group 3 below. Off-farm income is an important feature that distinguished Group 2 from Group (1). This group constitutes 15–20% of households in rural farm surveys and tends to be rising.

*Group 3: Farmers “stepping up” from small-scale to medium-scale holdings.* Commercialized medium-scale farmers operating 5–100 ha who were formerly small-scale farmers, successfully expanding their operations (“stepping up”) and contributing to rural transformation processes. Most of these former small-scale farmers are now operating in the 5–20 ha range, and their sociodemographic characteristics are similar to Group 2. A higher share of this group’s children remain in farming because of relatively superior returns compared to Group 1. This group typically constitutes 5–10% of the rural farm population in rural household surveys and is rising. The purchasing power of groups 2 and 3 are expanding the demand for nonfarm and off-farm goods and services, thereby expanding employment and earnings in the rural nonfarm economy.



*Group 4: New entrants “stepping in” to commercialized medium-scale operations.* Urban-based and rural people who relied primarily on non-farm incomes and then diversified their way into commercialized medium-scale (5–100 ha) farming operations. They generally have the education, connections, and access to finance to be productive farmers, and contributors to rural dynamism and transformation. This group constitutes an unknown share of the total number of farm households in Africa because they tend to be grossly under-represented in otherwise nationally representative rural household surveys in Africa, as detailed in Section 2. Based on the one country in Africa where this group has most likely been reasonably well captured (the Tanzanian Agricultural Sample Census Survey of 2008/2009), they constituted roughly two to three percent of all farms but up to 25% of total farmland under cultivation. Their major challenge to expansion is knowledge and trust – finding trusted managers who will effectively manage farm operations on their behalf while they continue to work in the city. This group also contains many retirees who invest in land and return to farming when they have the time to relocate to the rural area and oversee their farm operations. Based on interviews of this group, a relatively large share of these farmers’ children are entering into farming, inheriting their parents’ operations and/or using capital from the family to expand into their own medium- or large-scale farming operations.

*Group 5: Large-scale farms operating over 100 ha.* This group is not well surveyed in otherwise nationally representative datasets such as the LSMS and General Living Standards surveys, but including foreign-controlled, descendants of European settler farmers, African elites, state supported farm blocks, etc. Their role in African agriculture varies widely across countries based largely on historical and current policies of government.

## 9.2 | Implications for land tenure policies

The evidence available suggests that the wholesale conversion of customary land rights and traditional land administration systems into private, individual, freehold titles administered solely by formal government authorities is unlikely to contribute to much greater tenure security or land investments, in most cases. Instead, more flexible interventions to document customary land rights and strengthen customary or hybrid government-customary land administration institutions are needed to increase landholders’ perceived tenure security and agricultural investment and productivity outcomes. Although direct comparisons of different approaches to strengthening land tenure is complicated by the varying nature of the interventions and institutional arrangements, it is clear that land policies in Africa need to recognize the continued existence of customary land rights and customary land administration institutions to be have sustain-

able impacts on perceived tenure security and agricultural development.

Where customary land institutions remain relevant, as in most rural contexts in Africa, land policies that either formally recognize the authorities of these institutions (subject to conformity with national policy principles and objectives, for example with respect to strengthening women’s rights) or incorporate them into more comprehensive formal land administration institutions are most likely to succeed. For example, Zambia recognizes the authority of customary institutions to manage customary rural land rights, and a number of other land policies in the region have proscribed legal roles for customary leaders in land registration and administration (e.g., Botswana, Côte d’Ivoire, Ghana, Kenya). These policies represent a more “fit for purpose” approach to land administration that seeks to address current land tenure realities rather than attempting to replace existing customary institutions or introduce onerous technical standards that go beyond what is currently required to secure land rights.

Given the diverse nature of customary land tenure systems in Africa and threats to tenure security facing smallholder farmers, policies to strengthen tenure security and regulate land transactions in Africa will need to be carefully tailored to the local tenure context and needs of different landholders to affect perceived tenure security and agricultural outcomes. Where land rights derive primarily from community membership, customary tenure systems effectively regulate within-community transactions, and external actors pose the primary threat to land rights, land registration at the community level accompanied by formal recognition of customary tenure institutions may be sufficient to reduce insecurity. However, community rights registration may be expected to have more limited impacts on agricultural investment and productivity as compared to registration of rights and transactions on individual farm parcels, as the latter would strengthen the rights of those who invest in productivity-enhancing investments to future yields and/or rents. Thus, where land rights are already individualized and internal actors pose the greatest tenure security threat, and especially where informal transactions involving outsiders are common, the more costly and time-consuming investment of registering individual land rights and transactions may be needed to secure existing rights and avoid conflicts that are beyond the capacity of customary institutions to manage (Stickler et al., under review).

Regardless of the institutional form (customary/government/hybrid) and level of land registration (individual/community), experience suggests that land administration systems must adhere to a number of other principles to positively impact tenure security and rural transformation. First, to be effective in increasing perceived tenure security, land administration systems must be seen as legitimate by all stakeholders, including the most vulnerable landholders, as well as large private investors. Second, to be sustainable

(both fiscally and in terms of their ability to reflect land transactions), land administration must be decentralized to a level that balances user accessibility (and demand for land services) with recurrent administrative costs. (This remains an elusive objective for most land administration systems in Africa and calls into question the long-term sustainability of recent land registration interventions.) Finally, it is increasingly acknowledged that secure land rights are a necessary but insufficient condition to promote on-farm investment, productivity growth, broader multiplier/growth linkages between on-farm and off-farm development, and rural economic transformation. To accomplish these broader policy objectives, land administration systems must be linked to complementary institutions and services (Lawry et al., 2014). These include customary and formal dispute resolution mechanisms, as well as rural finance, utility services, and agricultural value chains, for example by linking service provision to recognized land rights and ensuring that land registration beneficiaries have access to agricultural input and output markets.

### 9.3 | Implications for national statistical agencies

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 under-reporting 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, that is, 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 do changing farm size distributions condition the strength and

location of farm, off-farm, and nonfarm growth linkage multipliers that influence rural incomes, economic growth, and the pace of rural poverty reduction? A stylized fact from Asia's agricultural development experience is that relatively unconcentrated land distribution patterns may stimulate rural development more effectively than highly concentrated landholding patterns. Smallholders have high marginal propensities to consume and spend their money in the local rural economy, thereby stimulating growth linkages between farm and nonfarm sectors (Mellor, 1995). If a few large-scale farmers dominate production and spend their money outside the local rural economy, then local growth multipliers may be weaker than in areas with more egalitarian land distributions (Johnston & Kilby, 1975). As shown earlier in this report, a sizeable and rising share of national agricultural land is controlled by urban-based households. To the extent that many of them are medium-scale investor farmers, they may be altering the relationship between the location of agricultural growth and the strength and location of growth multipliers with the nonfarm economy.

Another issue for future research concerns the broader effects of factor market development in Africa on changes in farmland ownership and use. It is noted that rural financial markets and financial inclusion are improving in the region; are they enabling people with access to these markets to purchase or lease land, invest in irrigation and soil conditioning, and intensify their use of cash inputs such as fertilizers and improved seeds, in ways that alter the distribution of farm sizes and scale. General equilibrium effects are almost certain to be important.

We have just begun to scratch the surface in our understanding of this important new development in Africa. African policy makers will benefit from immediate investment in improved data collection on medium- and large-scale farms as well as in-depth analysis to understand their potentially wide-ranging impacts on African economies.

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