

The potential of land shareholding cooperatives for inclusive agribusiness development in Africa

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Abstract

Land Shareholding Cooperatives (LSCs) centralize management over fragmented farmland by converting farmers' plots into shares. While these cooperatives have been widely successful in boosting agricultural commercialization among rural smallholders in China, their potential has not yet been recognized in the African context. To fill this gap, we present and discuss a theoretical framework based on recent literature, an in-depth case study from Uganda and quantitative analyses of data on horticultural cooperatives from Senegal and agricultural and livestock cooperatives from Uganda, Malawi, Madagascar, Rwanda and Kenya. We uncover the existence of cooperatives built on land sharing schemes in different parts of Africa and especially in Rwanda. We find that these LSCs are more likely to mobilize collective marketing and have a higher business-membership ratio than traditional cooperatives, and we derive a few implications for policymaking.

KEYWORDS

agricultural cooperatives, rural smallholders, land tenure, Africa

1 | INTRODUCTION

African countries have made multiple attempts to reform their land tenure systems, contributing to a gradual but general shift from communal to individual land ownership. However,

ownership of farmland remains vaguely defined in many parts of rural Africa where land markets are often thin and imperfect and land transfers remain largely based on patrilineal inheritance. Given high population growth, this system of inheritance has led to progressive land fragmentation, reducing the size of most farms below the threshold of the average surface area that is commercially viable. Large-scale acquisitions of farmland are increasingly seen as strategies for rural transformation by encouraging investment in agriculture thereby contributing to increased agribusiness and rural employment. In the presence of unclear land tenure systems, large-scale acquisitions have often been denounced as “land grabs”, benefiting partnerships forged between government elites and foreign investors, and neglecting indigenous property rights. Because farmland is a vital asset for African smallholders, land grabbing has the potential to exacerbate rural poverty and large-scale migration towards (inter)national urban areas. Civil as well as violent struggles against land grabbing seemed to have deterred large-scale land acquisition but also initiatives geared towards farmland consolidation and agribusiness development. It has been shown that public–private investments for land acquisition are more prevalent in African countries where yields are well below their estimated potential. Rural communities in Africa thus find themselves in a conundrum where they need to increase commercialization to stave off land grabbers but lack the necessary farm-size to generate economies of scale (AfDB, 2016; Arezki, Deininger, & Selod, 2015; Holden & Otsuka, 2014; Jayne, Chamberlin, & Headey, 2014).

Land Shareholding Cooperatives (LSCs) have the potential to overcome this conundrum as they are conceived to set up land consolidation schemes in the presence of incomplete or imperfect land markets. By joining an LSC, smallholders convert their plots into shares, allowing the cooperative to re-collectivize or centralize management over fragmented farmland, without having to make any formal land transfer. These cooperatives promote and facilitate land consolidation, creating the conditions for smallholders to realize economies of scale, engage in collective or aggregated commercialization of agricultural produce and extract additional value from fragmented farmland. At the end of the fiscal year, members receive dividends that are set in proportion to the number of shares they hold, and the profit made by their LSC through collective marketing. The main advantage of a land-sharing arrangement is that farmland can be consolidated with smallholders retaining ownership of their plots. In rural China—where farmland is rarely exchanged through the market, highly fragmented and increasingly up for grabs, much like in Africa—LSCs are said to boost agricultural commercialization. LSCs are now officially endorsed by the Chinese Ministry of Agriculture and the Jiangsu province alone has registered about 1,800 of these cooperatives. Many other provinces are also witnessing the proliferation of LSCs, often led by local government officials able to involve pre-existing community-based cooperatives in the delicate and painstaking process of defining members’ property rights and managing collective farmland. Local authorities usually incentivize this land devolution process by granting cooperatives the right to use public land that is locally available. Land devolution incentives provide these cooperatives with the opportunity to scale-up land consolidation schemes and maximize members’ dividends (Chen, 2015; Pairault, 2017; Po, 2008; Ren, Bian, & He, 2017).

Notwithstanding the success of LSCs in China, their existence in rural Africa and their potential to help African smallholders overcome farmland fragmentation and boost agricultural commercialization has so far remained undocumented. In this study we contribute to filling this gap in the literature. We first make a theoretical case for the development of LSCs in rural Africa. We then describe our primary data on the prevalence, performance and genesis of LSCs in Africa. Findings are presented in a sequence of nested analyses, which include a case study on a palm oil

cooperative from Bugala island in Lake Victoria, an analysis of 395 horticultural cooperatives in Senegal and an analysis of 443 cooperatives involved in various agricultural and livestock value chains in Uganda, Malawi, Madagascar, Rwanda and Kenya. We conclude that land devolution processes give rise to LSCs and boost agricultural commercialization also in Africa, and we derive some implications for policy and for further research.

2 | THEORY

Cooperative organizations based on member ownership and control are widespread throughout rural Africa (Borzaga et al., 2014; Wanyama, Develtere, & Pollet, 2008, 2014; World Bank, 2007). The scant data available suggest that every other rural village in Africa houses a cooperative (Bernard, Collion, de Janvry, & Rondot, 2008a, 2010; Hill, Bernard, & Dewina, 2008). The literature on agricultural cooperatives in Africa concludes that when smallholders join these organizations they derive benefits from mutual support—for weeding, harvesting and other labor-intensive activities, but also for financing funerals, weddings, health treatments, and so on—and they gain access to subsidized inputs and services provided by governments and donors. These benefits overall translate into significantly more efficient and resilient farm-households (Abate, Francesconi, & Getnet, 2014a, 2014b; Balineau, 2013; Francesconi & Ruben, 2014; ISSER, 2012). However, only a few cooperatives in Africa appear to be successful in commercializing the agricultural produce of their members (Bernard, Taffesse, & Gabre-Madhin, 2008b; Francesconi & Heerink, 2010; Francesconi & Wouterse, 2019). Even when collective commercialization takes place, the share of members' produce that is sold through cooperatives tends to be small as farmers prefer to side-sell their output through middlemen who offer more convenient on-the-spot transactions (Francesconi & Ruben, 2014; Hill et al., 2008). This is in sharp contrast with the situation in Europe where more than 40% of agricultural production is sold through cooperatives (Bijman et al., 2012). Bulk or collective agro-commodity marketing is associated with cooperatives that succeed in providing their members with higher output prices and profit-making opportunities (Bernard et al., 2008b). Since African smallholders have little capital to share in the first place, their failure to engage in collective marketing tends to lead to cooperatives' undercapitalization. Subsidies are thus widely sought by African cooperatives, many of which appear to rise and fall with externally funded development programs and projects (Francesconi & Wouterse, 2015a).

Over the past two decades, the progressive liberalization and globalization of markets for agricultural products on the continent have reduced the commercial opportunities for rural smallholders, depriving them of parastatal buyers (namely state-owned marketing boards) and exposing them to increasing competition by agro-food importers and large-commercial farmers (BarretT, 2007). The decline of income generation capacity among rural smallholders has led to pressure on cooperatives to serve as market intermediaries (Wanyama et al., 2008). However, bulking and collective sales services of cooperatives have often been compromised by high transaction costs associated with poor enforcement of property rights, weak information flows, high business risks and underdeveloped infrastructure (Dorward, Kydd, Morrison, & Poulton, 2005; Valentinov, 2008). In particular, vaguely defined and poorly enforced property rights have fostered insecurity in land tenure and hindered the development of a land market, and in combination with growing population pressure, have led to progressive land fragmentation. The fragmentation or atomization of farmland has induced agricultural cooperatives to cater for a growing number of shrinking farms in an attempt to realize economies of scale and preserve community

cohesion. However, in the absence of complete market information, formal contractual agreements (to reduce business risks) and adequate infrastructure (electricity, roads, storage, and so on), many cooperatives have instead become party to diseconomies of scale or crowding-in effects inducing smallholders to side-sell their produce (de Janvry, McIntosh, & Sadoulet, 2010; Francesconi & Ruben, 2014).

In developed countries, cooperatives have also emerged as a means for communities to ensure mutual and public support in the presence of market failures (Sexton, 1986). However, governments of these countries have generally remedied or corrected market failures and gaps in infrastructure and information-flows, thereby reducing uncertainty in land tenure and in the business environment (Valentinov, 2008). As a result, in these countries cooperatives have been able to play an increasingly commercial or income-generating role (Cook, 2018). However, the transition from defensive to offensive cooperation remains incomplete in many parts of rural Africa because governments are not able to lower transaction costs across vast and remote rural territories (Francesconi & Wouterse, 2019). This could be why many African cooperatives continue to have a defensive or community-oriented function that is similar to the role they originally played during colonialism. The persistence of traditional cooperatives justifies the search for alternative models that have greater potential to trigger market-oriented cooperation in rural Africa and allow local smallholders to benefit from trade on the global market. Although the organizational and management literature has long focused on developed countries, recent research has started to shed some light on new and promising cooperative business models arising in other and less favorable contexts, also within Africa.

According to Tadesse, Abate, and Ergano (2019) and Francesconi and Wouterse (2015a, b 2019), collective marketing is more likely to take place in African cooperatives that manage to re-define their organizational boundaries, by focusing on the provision of commercial services to particularly committed members (as opposed to embracing community-wide social services). Ren et al. (2017) suggest that land shareholding cooperatives (LSCs) provide a suitable model to do so. The potential of this model stems from the conversion of members' plots into shares which introduces an additional entry requirement, which redefines membership-boundaries around individuals that are committed to put "skin in the game", so as to maximize social capital and thus group cohesion. The model also simultaneously introduces an additional contractual arrangement, which redefines service-boundaries by centralizing and professionalizing the management of farmland in such a way to maximize managerial capital and thus business efficiency.

The LSC model enabled Chinese smallholders to overcome farmland fragmentation constraints and capitalize on opportunities for collective commercialization whilst preserving the cooperative identity and its underlying principles (as defined by the International Cooperative Alliance).¹ However, with the notable exception of Rwanda, the potential of the LSC model has not yet been recognized in the context of rural Africa. In Rwanda, post-genocide policy and governance reforms have consistently been designed to engage cooperatives in defining and enforcing land tenure and management. This process, which is locally known as "Umuganda" and intended to reconcile and reunite Rwanda's communities, led to the rise of a new generation of Rwandan cooperatives geared towards land consolidation and collective-marketing. (AfDB, 2016; ILO, 2010; NCCR and OCDC, 2018).

Similar attempts to diverge from traditional cooperative models are, however, rare and often frowned upon in the rest of Africa. This is arguably because governments and donors continue to

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narrowly and rigidly identify cooperatives with organizational models from Europe during colonial times. A commonly heard narrative in (inter)national fora is that the sub-optimal performance of African cooperatives is due to the systematic misinterpretation and corruption of the original cooperative model from 19th century Great Britain (the Rochdale Society of Equitable Pioneers). Paradoxically, a large and growing body of research suggests that the survival of agricultural cooperatives worldwide depends instead on their ability and willingness to embrace change management and organizational innovation in response to global economic changes (Cook, 2018; Bijman et al. 2014; Bijman et al., 2012; Chaddad & Cook, 2004; Cook & Iliopoulos, 1999; Ortmann & King, 2007; Sykuta & Cook, 2001). The remainder of this study attempts to substantiate this theoretical framework on the basis of a wealth of primary data that was gathered through mixed methods as described in the next section.

3 | DATA

The largest dataset used in this study originated from five Cooperative Learning and Leadership Events (CLLEs) that took place between 2016 and 2019, in Uganda, Malawi, Madagascar, Rwanda and Kenya. The first author of this study led and facilitated the organization of these events with the support of the US Overseas Cooperative Development Council (OCDC), CTA (EU-ACP), CIAT (CGIAR) and many other international and in-country partners.² In-country partners selected organizations on the basis of stratified techniques geared towards country-level or national representativeness. Invited cooperatives selected one person per organization to participate in the event.³ The CLLEs were intended to strengthen the managerial capacity of the leaders (board members and managers) of agricultural cooperatives and similar farmer-owned organizations, to engage in strategic debates with relevant policymakers and to collect primary data on rural collective action. At least a week before each event the leaders of selected cooperatives received a structured and standardized questionnaire to fill out. Their responses were revisited during the CLLEs through extensive focus group discussions led by research-assistants under the direct supervision of the first author of this study.

The event-based survey method produced quantitative data for a total of 443 agricultural cooperatives and farmer-owned organizations from the five target countries, together with a wealth of field-based knowledge in the form of qualitative information.

As described in Table 1, the 443 cooperatives in our dataset cover all regions and 64 percent of districts in the five countries. Coverage is inevitably smaller in Madagascar (the largest country) and larger in Rwanda (the smallest country). Kenya has a significantly smaller sample than the other countries because the last CLLE held in Nairobi gathered the leaders of several cooperatives that were not involved in agriculture and were therefore discarded from this analysis. It is important to note that no major shocks—such as draughts, floods, pests, economic crises, wars or epidemics—occurred in any of the five countries during the 12 months that preceded and encompassed data collection efforts. The resulting dataset is thus expected to capture the status of cooperatives under “normal” circumstances. The main characteristics of sampled cooperatives are described in Table 2 and Figure 1. Table 2 shows that Kenyan cooperatives stand out for being

² Including OXFAM, NCBA-CLUSA, GIZ, FAO, IFAD, Land O'Lakes, USADF, Global Communities, HealthPartners, Genex, ACE (Malawi), ACIDI-VOCA, NASFAM (Malawi), FUM (Malawi), UCA (Uganda), UNFFE (Uganda), NCCR (Rwanda), CUK (Kenya).

³ All participants received full sponsorship, over a period of five days per participant, by the organizers of these events.

TABLE 1 Cross-country sample of agricultural cooperatives from south-east Africa

Country (survey date)	Sampled regions	Sampled districts	Sampled coops
Uganda (May 2016)	100%	50%	96
Malawi (Sept. 2016)	100%	86%	92
Madagascar (Feb. 2017)	100%	35%	104
Rwanda (Feb. 2018)	100%	90%	97
Kenya (Aug. 2019)	100%	57%	54
All	100%	64%	443

TABLE 2 Age and size of agricultural cooperatives

Age of cooperatives (in years since establishment):	Obs.	Mean (std. dev.)	Min/Max
in all 5 countries	443	9.2 (12.1)	1/69
in Uganda	96	9.8 (13.1)	1/63
in Malawi	92	6.7 (5.9)	1/29
in Madagascar	104	3.2 (3.5)	1/18
in Rwanda	97	9.9 (5.4)	1/42
in Kenya	54	23.2 (22.4)	1/69
Size of cooperatives (n. of members):			
in all 5 countries	443	1,068 (3,110)	7/45,000
in Uganda	96	1,838 (3092)	15/13,000
in Malawi	92	1,166 (2,723)	12/13,350
in Madagascar	104	60.8 (135.8)	7/1,220
in Rwanda	97	528.9 (833.6)	15/3,671
in Kenya	54	2,498 (6,735)	15/45,000

the oldest and largest (in terms of membership size), whereas Malagasy cooperatives appear to be the youngest and smallest, on average. Figure 1 shows instead that Rwandan cooperatives stand out for being the most gender-balanced as almost 50% of these organisations sent female representatives to attend the CLLE.

In addition to this cross-country dataset, our analysis draws on quantitative data for a total of 395 Water User Associations (WUAs) based in Senegal, which was collected in 2017 by IFPRI (CGIAR)—with the direct involvement of the second author of this study—as part of a nationally representative survey of the domestic horticultural value chain.⁴ We also use qualitative data obtained in 2016 through field visits and key informant interviews led by the first author of this paper, as part of an in-depth case study commissioned by IFAD on an Ugandan association of Oil Pam producers;

The main strength of available data is that it was collected through different approaches and the direct involvement of the authors of this study. Asymmetries and disconnections between the reality on the ground and research findings should therefore be minimal. The main limitation is

⁴This survey-work was carried out under the Agricultural Policy Support Project (PAPA; www.papa.gouv.sn) led by the Government of Senegal, funded by USAID as part of the “Feed the Future” program and implemented over a period of three years (2015–18) by the Ministry of Agriculture and Rural Equipment.

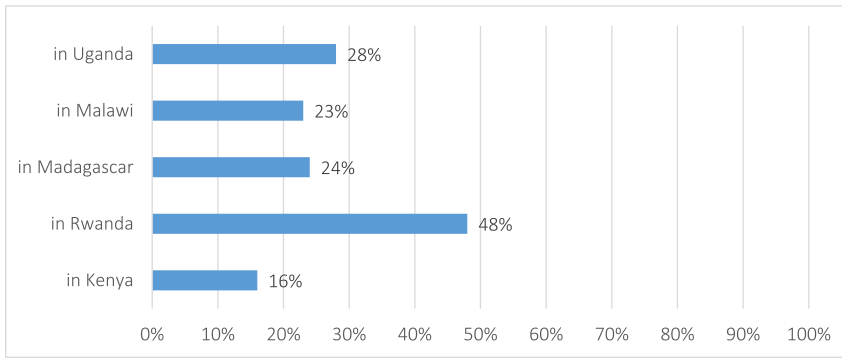


FIGURE 1 Prevalence of female leaders in agricultural cooperatives [Colour figure can be viewed at wiley-onlinelibrary.com]

FIGURE 2 Location of case study, Bugala island



that data was collected through cross-section surveys carried out at one point in time. This affects our ability to fully overcome endogeneity issues and identify causal relationships. Findings are presented through a sequence of nested analyses intended to provide a perspective that goes from local to country to regional and from qualitative to quantitative.

4 | CASE STUDY

In 2006, after a complex and lengthy negotiation process involving community leaders, district authorities and private landlords, the Government of Uganda (GOU) re-gained full ownership over all farmland available on Bugala island in Lake Victoria (Figure 2). This process was driven by the government's ambitious proposal to convert 11,200 hectares of fertile but partly idle and largely under-farmed land into a commercial oil palm plantation. At the time, Uganda was spending almost nine million USD to import about 80,000 tonnes of crude palm oil every year. In

particular, the government plan entailed the development of two plantations to be respectively managed by a foreign investor-owned firm (IOF) and an association of local smallholders. 6,500 hectares were thus leased to BIDCO Kenya Oil Refineries, a subsidiary of a multinational IOF, which agreed to convert this farmland into an oil palm plantation and a nursery, and build three mills for processing fruit bunches into crude palm oil and a large refinery for processing crude palm oil into marketable products. The remaining 4,700 hectares were instead leased to a pre-existing association comprising 1,770 member-households that had been farming over the island for decades on the basis of informal agreements with previous landowners i.e. community leaders, local authorities and private landlords.

In return for this concession, the association had to undergo major organizational changes that involved the conversion of all 4,700 hectares of farmland into shares and the equitable distribution of these shares among its member-households. This process led the transformation of this traditional association into a fully-fledged LSC. The average member-household received a shareholding certificate corresponding to a plot of land of about 2.5 hectares. Members also benefited from a total of 11.5 million USD worth of loans—guaranteed against a collateral or matching grant provided by IFAD—in order to sustain their livelihoods during the first five-year period needed for oil palms to reach maturity and become productive. IFAD provided an additional 8.5 million USD loan for the cooperative to hire a professional manager and 22 extension agents, purchase trucks, tractors, motorbikes and build a warehouse. The staff of the cooperative was charged with the responsibility to develop the land held by members through the planting of oil palm seedlings and fertilization. As soon as trees began to bear fruits, around 2011, the cooperative employees further took on harvesting and aggregation activities as well as the transportation and sale of palm fruits to BIDCO's newly established processing facilities.

By 2016, the cooperative had repaid almost half of the loan received from IFAD based on the revenues generated throughout just five years of production. Bugala island had visibly changed. From being a disconnected island with no infrastructure and a shrinking and aging population dependent on depleting fish-stocks, into one of the most developed districts in Uganda with a new road network, electricity grid and ferry services. Overfishing had ceased to be a problem since most of the population plus a growing number of returning migrants could generate enough income from agriculture. Between 2011 and 2016, the average member-household of the cooperative had received about 9,000 USD per year in dividends. This revenue stream is expected to continue until 2036 as palm trees have an average productive life of 25 years. Furthermore, the average member-household had considerably reduced its on-farm work load, thanks to the extension services provided by the cooperative and gained the necessary capital and time to invest in off-farm business opportunities arising within and outside the island. Less time and cash constrained members had also become increasingly active in the preservation of the island's pristine forests and coastal buffer zones, in order to prevent encroaching by oil palm plantations and leakages of fertilizer into the lake.

In conclusion, this case study highlights that the commercial success of this African LSC was made possible through sizeable public investments geared towards land devolution, which allowed the cooperative to centralize and professionalize management over fragmented farmland. Investments of this kind may however be hard to replicate thus limiting attempts to upscale the LSC model across the continent. Even so, it is important to realize that one case study is by no means enough to draw conclusion as to the commercial potential of the LSC model across rural Africa. To broaden the scope of the analysis, the next section thus considers a sample of cooperatives involved in Senegal's horticultural value chain.

TABLE 3 Data on WUAs in Senegal

Association-level indicators:	Obs.	Mean (std. dev.)	Min/Max
Collective marketing: 1 = yes	395	0.50 (0.50)	0/1
Centrally managed production: 1 = yes	395	0.61 (0.49)	0/1
Location in Kaolack region	395	0.04 (0.19)	0/1
Location in Kaffrine region	395	0.04 (0.16)	0/1
Location in Ziguinchor region	395	0.14 (0.35)	0/1
Location in Tambacounda region	395	0.16 (0.37)	0/1
Location in Sedhiou region	395	0.09 (0.29)	0/1
Location in Thies region	395	0.04 (0.16)	0/1
Location in Kedougou region	395	0.08 (0.27)	0/1
Location in Fatick region	395	0.06 (0.24)	0/1
Location in Kolda region	395	0.15 (0.36)	0/1
Location in Diourbel region	395	0.03 (0.16)	0/1
Location in Matam region	395	0.17 (0.38)	0/1

5 | VALUE-CHAIN ANALYSIS

The following analysis concerns 395 Water Use Associations (WUAs) operating in horticulture producing areas throughout Senegal. These associations were all legally registered as GIEs (groupements d'intérêt économique), which in West and Central Africa represent a simpler and more prevalent typology of cooperative or member-owned enterprises. WUAs emerged throughout the country to manage irrigated perimeters that had been developed by the Senegalese government and international donors (mostly USAID) in the early 2000s. These small-scale irrigation schemes were leased out to pre-existing GIEs in order to produce horticultural crops destined for (inter)national urban markets. The average size of WUAs is estimated at about 100 members, the majority of which are women. In Senegal, women tend to be more heavily involved in horticulture. Given that in rural Senegal land is traditionally held by men and transferred from father to son, women were favored for leasing of irrigated perimeters. It is also important to note that the members of these associations were required to buy nominal shares (or parts sociales) corresponding to the number or size of sub-plots they chose to hold from a given irrigated perimeter.

Table 3 shows that 61% of the WUAs in our sample had centralized management of plots of their members and thus over the farming activities carried out within the irrigated perimeters. In the remaining 39% of the associations, plots were farmed according to members' individual preferences. The combination of shared land (that is, irrigated perimeters) and centralized management over farming activities means that the majority of WUAs are de-facto LSCs. Table 3 also shows that during the previous 12 months half of sampled associations had sold most of their horticultural produce collectively while the rest had relied on direct and arm-length transactions between individual members and available buyers. Finally, Table 3 finally shows the distribution of WUAs throughout the country with these associations most prevalent in the regions of Matam, Tambacounda, Kolda and Ziguinchor.

Below we test our hypothesis is that associations embracing the LSC model—or centralizing management over irrigated perimeters—are also more likely to engage in collective

TABLE 4 Probit regression estimating the probability for WUAs to engage in collective marketing

Collective marketing (y): 1 = yes	Marginal effects after probit: coefficient (robust std. err.)
Centrally managed production (x): 1 = yes	0.83 (0.03)***
Location in Kaolack region (fe)	-0.02 (0.16)
Location in Kaffrine region (fe)	0.40 (0.10)**
Location in Ziguinchor region (fe)	-0.07 (0.12)
Location in Tambacounda region (fe)	-0.02 (0.10)
Location in Sedhiou region (fe)	0.33 (0.13)**
Location in Thies region (fe)	0.54 (0.08)***
Location in Kedougou region (fe)	0.24 (0.19)
Location in Fatick region (fe)	0.00 (0.16)
Location in Kolda region (fe)	0.25 (0.12)**
Location in Diourbel region (fe)	-0.03 (0.24)
Location in Matam region (fe)	excluded
Pseudo-R-squared	0.5771
Number of observations	395

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

commercialization. We specify the following reduced-form equation:

$$y_i = \alpha_0 + \alpha_1 x_i + \alpha_{2-11} f e_i + e_i, \quad (1)$$

where (y) takes the value of 1 when an association *i* engages in the collective commercialization of horticultural produce and 0 otherwise, (x) captures whether a group *i* centralizes management over farming activities or not and (fe) controls for the spatial fixed effects associated with 10 of the regions covered by our sample (excluding the region of Matam). As anticipated in Section 3, the main limitation that we face in estimating Equation (1) relates to potential endogeneity problems and estimation results cannot be interpreted as cause-effect relationships.

The regression results presented in Table 4 allow us to conclude that the probability to engage in collective commercialization is indeed significantly higher (at the 1% level) for associations that centralize management over farming activities.

The adoption of the LSC model, which relies on the support of government and donors not only for the development of irrigated perimeters, but also to build up the managerial capital, is therefore associated with collective commercialization by WUAs. In line with the previous case study, we deduce that the establishment of commercially successful WUAs depends on the availability of sizeable and comprehensive public support, in the form of both financial and managerial capital, which tend to be a major constraining factor for the upscaling of the LSC model in Africa. However, this analysis further demonstrates that market-oriented LSCs do not have to be standalone or exceptional success stories but can emerge as a country-wide movement albeit not uniformly successful. Still, it is important to realize that the analysis of one value chain in one country does not allow us to infer about the commercial potential of the LSC model in the context of rural Africa. To further expand the scope of the analysis, the next section considers a cross-country sample of cooperatives involved in various agricultural and livestock value chains across the southern-eastern region of Africa.

TABLE 5 Cross-country data on agricultural cooperatives

Organization-level indicators	Obs.	Mean (std. dev.)	Min/Max
Business/membership (Y): USD/year	443	109.04 (115.03)	0/960
In Uganda	96	85.69 (63.48)	24/281
In Malawi	92	47.68 (46.73)	0/157
In Madagascar	104	74.63 (54.66)	0/303
In Rwanda	97	205.45 (55.69)	157/383
In Kenya	54	148.21 (243.98)	0/960
Central management of farmland (X): 1 = yes	443	0.51 (0.50)	0/1
In Uganda	96	0.52 (0.50)	0/1
In Malawi	92	0.48 (0.50)	0/1
In Madagascar	104	0.41 (0.49)	0/1
In Rwanda	97	0.71 (0.46)	0/1
In Kenya	54	0.37 (0.49)	0/1

TABLE 6 Seemingly unrelated regressions (SUR) of cross-country differences

Organization-level indicators	Business/membership (Y) coefficient (std. err.)	Central land management (X) coefficient (std. err.)
Location in Uganda: 1 = yes	-119.76 (14.25) ^{***}	-0.19 (0.07) ^{***}
Location in Malawi: 1 = yes	-157.77 (14.41) ^{***}	-0.23 (0.07) ^{***}
Location in Madagascar: 1 = yes	-130.82 (13.97) ^{***}	-0.30 (0.07) ^{***}
Location in Kenya: 1 = yes	-57.24 (16.80) ^{***}	-0.34 (0.08) ^{***}
Location in Rwanda: 1 = yes	excluded	excluded
R-squared	0.2576	0.0547
No. of observations	443	443

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

6 | CROSS-COUNTRY ANALYSIS

The discussions that took place in Uganda, Malawi, Madagascar, Rwanda and Kenya during the Cooperative Learning and Leadership Events (CLLEs), revealed that the LSC model tends to be associated with particularly successful cooperatives, such as Kenya's "cooperative ranches", which are beef and dairy cooperatives that centrally manage shared or consolidated pastures and livestock; coffee, tea and other cash-crop cooperatives that centrally manage shared or consolidated plantations and nurseries in different parts of the region, and especially in Rwanda.

While a few of these organizations were described as pure LSCs, the majority appeared to be hybrids containing a blend of consolidated and fragmented farmland. In the following analysis we consider also these hybrid models as LSCs. It is important to note that Tables 5 and 6 show that these loosely defined LSCs—encompassing all cooperatives that have centralized management over some farmland are significantly (at the one percent level) more prevalent in Rwanda than in the other four countries. In particular, 71% of the cooperatives sampled in Rwanda fall in the LSC category, against 37–52% in the other four countries. This finding supports the abovementioned theory that post-genocide governance in Rwanda has contributed to mainstream land devolution processes, which in turn transformed traditional cooperatives into hybrid LSCs.

TABLE 7 Ordinary least squares (OLS) regression explaining cooperative performance

Business/membership (Y): USD/year	Coefficient (robust std. err.)
Centralized management of farmland (X): 1 = yes	24.27 (9.74) ^{***}
Location in Uganda (ug): 1 = yes	-115.13 (8.81) ^{***}
Location in Malawi (mw): 1 = yes	-152.11 (7.79) ^{***}
Location in Madagascar (ma): 1 = yes	-123.59 (8.37) ^{***}
Location in Kenya (ke): 1 = yes	-48.96 (33.74)
Location in Rwanda: 1 = yes	excluded
R-squared	0.2681
No. of observations	443

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

Tables 5 and 6 further show that Rwanda is also the country where cooperatives tend to have significantly higher business–membership ratios. Given that the business–membership ratio (Y) of a cooperative i is defined as the revenues generated by a cooperative over the previous 12 months through the aggregation and commercialization of members' agricultural produce (B), divided by the number of registered members (M):

$$Y_i = B_i/M_i. \quad (2)$$

From Table 5 we see that during the 12 months that preceded our surveys the average cooperative generated about 109 USD per member through collective commercialization. This small amount validates previous evidence suggesting that the role played by African cooperatives in marketing agricultural output is rather negligible. However, the business–membership ratios of sampled cooperatives is not negligible across the board. In particular, Table 6 shows that the average ratio is significantly higher in Rwanda (205 USD/year) than in the other four countries (48–148 USD/year). This may be because Rwandan cooperatives are more likely to adopt the LSC model or it could be due to the fact that Rwanda provides a more enabling environment for agribusiness development, or it could be simply attributed to the presence of a sample selection bias.

To better identify the relationship between the LSC model (X) and commercial performance (Y), we estimate the following reduced-form equation:

$$Y_i = \beta_0 + \beta_1 X + \beta_2 ug_i + \beta_3 mw_i + \beta_4 ma_i + \beta_5 ke + e_i. \quad (3)$$

In particular, we specify four binary variables (ug , mw , ma , ke) to control for country-specific fixed effects that may confound the relationship between (Y) and (X). The main limitation that we face in estimating Equation (3) relates to potential endogeneity problems and estimation results need to be interpreted as correlations rather than cause–effect relationships. Still, regression results in Table 7 show that the business–membership ratio is significantly higher in LSCs or cooperatives that centralize management over farmland. In particular, the average LSC generates an extra 24 USD per member through collective commercialization. Although these gains are modest, it is important to acknowledge that its magnitude may increase together with the size of the land consolidated by these cooperatives. Although our explanatory variable (X) does not account for differences in the size of farmland that is centrally managed by cooperatives, it is

reasonable to assume that these land consolidation schemes are at an early stage of development and thus relatively small.

7 | CONCLUSIONS AND IMPLICATIONS

Land Shareholding Cooperatives (LSCs) centralize management over fragmented and underexploited farmland by converting members' plots into shares. While LSCs are considered as widely successful in boosting agricultural commercialization and alleviating rural poverty in China, their presence and potential has not yet been recognized in the African context. LSCs are only a minor player in agricultural markets in Africa. One reason for this is that countries are less likely to dispose of the necessary resources to carry out a process of restructuring of the land market by devolving formal rights to the population. This means that LSCs remain confined to donor-supported programs and projects that tend to produce scattered and volatile success stories but fail to add up and create a momentum.

In this study we have analyzed a wealth of primary, qualitative and quantitative data in an attempt to tease out the role played by LSCs in Senegal, Uganda, Malawi, Madagascar, Rwanda and Kenya. The evidence produced in this way suggests that the adoption of the LSC model is associated with a significant increase in the business performance or income generation capacity of African cooperatives. However, the cross-section design of this study means we cannot ascertain whether it is the adoption of the LSC model that creates market opportunities or the other way around. Despite this limitation, we observe that market-oriented LSCs arise in response to land devolution schemes. These schemes can help build the natural and managerial capital needed by traditional cooperatives to consolidate, centralize and professionalize increasingly fragmented farming systems. Land devolution schemes are difficult and expensive to implement. In Africa, Rwanda is one of the few countries to have embraced and sustained a land devolution process giving rise to a new generation of LSCs. Rwanda is a small country with a highly efficient and effective government. The country's efforts to rebuild with strong donor support after its turbulent and deadly past, seems to have strengthened the populations' motivation to work together towards the creation of common goods and services. Without appropriate incentives, other African countries are unlikely to pursue land devolution in the same manner. However, an alternative approach is possible. The case study for Uganda revealed that successful restructuring of the land market implied balancing land devolution to rural communities and land acquisition by private investors. This balance is required because while public-private partnerships have the potential to maximize efficiency in the use of farmland, they also tend to lead to elite capture and civil unrest. Management of land by community-based organizations may instead entail additional complexity but also greater sustainability (Ostrom, 1990).

Our conclusions are in line with the lessons derived by previous research on LSCs in China emphasizing the relevance of the south-south learning approach taken by this study. Our conclusions as well as further research on the topic could help African smallholders break away from ill-fitting cooperative models from the past and allow for the increased participation of smallholders in agricultural markets thereby enhancing their productivity and welfare.

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