UNITED NATIONS UNIVERSITY
UNU-WIDER

WIDER Working Paper 2016/159

Where is commercial farming expanding in Mozambique?

Evidence from agricultural surveys

Steven Glover,[1] Vincenzo Salvucci,[2] and Sam Jones[3]

December 2016

United Nations University World Institute for Development Economics Research
wider.unu.edu

Abstract: This paper studies the dynamics of the agricultural sector in Mozambique, focusing on the role of commercial farms. Using agricultural survey data from 2002 to 2012, we analyse the spatial distribution of large farms and identify factors influencing their location decisions. We find that the spatial dispersion of large farms across the country is not uniform. Large farms tend to be located in wealthier and more educated areas, with better road access and higher levels of population density. Given an increasing volume of investments in the agricultural sector in Mozambique, a better understanding of these spatial trends can shed light on the processes through which large commercial farming entities may influence smallholder agricultural production and rural welfare.

Keywords: agriculture, large commercial farms, spatial localization
JEL classification: Q10, Q12, Q15, R12, R14

Maps: at end of paper (all based on authors' calculations).

Acknowledgements: The authors would like to thank Benedito Cunguara, Aurélio Mate, and Domingos Diogo for their support with the data, and the technical staff at the Directorate of Economic and Financial Studies (DEEF) of the Ministry of Economics and Finance (MEF), Maputo, Mozambique, for insightful comments on earlier drafts.

[1] Independent consultant; [2] UNU-WIDER, Helsinki, Finland, corresponding author: Vincenzo@wider.unu.edu; [3] University of Copenhagen, Denmark.

This study has been prepared within the project on 'Inclusive growth in Mozambique—scaling up research and capacity' implemented through a collaboration between UNU-WIDER, the University of Copenhagen, University Eduardo Mondlane, and the Mozambican Ministry of Economics and Finance. The project is financed through specific programme contributions by the governments of Denmark, Finland, Norway, and Switzerland.

Information and requests: publications@wider.unu.edu

ISSN 1798-7237 ISBN 978-92-9256-203-8

Typescript prepared by Joseph Laredo.

The United Nations University World Institute for Development Economics Research provides economic analysis and policy advice with the aim of promoting sustainable and equitable development. The Institute began operations in 1985 in Helsinki, Finland, as the first research and training centre of the United Nations University. Today it is a unique blend of think tank, research institute, and UN agency—providing a range of services from policy advice to governments as well as freely available original research.

The Institute is funded through income from an endowment fund with additional contributions to its work programme from Denmark, Finland, Sweden, and the United Kingdom.

Katajanokanlaituri 6 B, 00160 Helsinki, Finland

1 Introduction

Agricultural performance has been mixed in recent years in Mozambique. On the one hand, national accounts data show that the value added attributable to the sector has grown consistently above 5 per cent in real terms every year from 2001 to 2010 (INE 2016). However, estimates of the evolution of absolute poverty (Arndt et al. 2012; DNEAP 2010) and estimates from nationally representative agricultural surveys of small and medium farm owners (*trabalho do inquérito agrícola*, TIA; *inquérito agrícola integrado*, IAI) over the same period (Glover et al. forthcoming) fail to indicate significant or sustained economic progress for the average rural household. One reason for the difference between national accounts and survey data could be that large commercial farms—i.e. farms that cultivate areas larger than 50 ha—are excluded from standard household-based surveys. It follows that for a complete understanding of the dynamics of the agricultural sector in Mozambique must take into account the experiences of commercial farms. This is our intention here.

A further motivation for our analysis is the so-called new wave of global interest in farmland investment. This was particularly acute following the food price spikes in 2008, and preliminary data suggest that usage rights over millions of hectares of arable farmland in Africa have been obtained by a variety of investors. Termed 'land-grabbing' in the international media and in policy circles, large land acquisitions have polarized opinions throughout the development community. Some proclaim their employment-generating, tax base-growing, social infrastructure-building virtues (Deininger et al. 2011). Detractors argue that such investments are exploitative and subject to elite-capture, and that land is often misappropriated without the full knowledge and consent of those affected (Cotula 2013; FAO 2013; Li 2011).

In Mozambique, official attitudes to foreign investment in the agricultural sector are positive. Several government projects, supported by foreign donors, have been encouraging large-scale investment in the agricultural sector, often under the theme of 'growth corridors' (G8 New Alliance 2013). These include large projects such as ProSAVANA and the G8 New Alliance for Food Security and Nutrition; along with the Beira Agricultural Growth Corridor (BAGC) to some degree. Analysts broadly agree that Mozambique has been a prime target of the new wave of land acquisitions (Cotula 2013; Deininger et al. 2011). However, as is common throughout the literature, little empirical evidence is available regarding either the tendencies in or the effects of such investments. To start to fill this gap, this paper employs unique panel data on commercial farms in Mozambique. Our aim is simply to investigate spatial trends in the location, expansion, and operation of such firms across the country. In doing so, we aim to bring hard evidence to the debate and observe the progress toward establishing 'agricultural growth corridors'.

The rest of the paper proceeds as follows: Section 2 provides context to the recent global interest in farmland in Mozambique, focusing on what is understood and summarizing the associated costs and benefits elaborated in the literature. Section 3 introduces our dataset of current large farming operations, compares this against the data of acquired land usage rights, and presents basic spatial visualizations of commercial agriculture in Mozambique. Section 4 presents further mapping visualizations and correlation tests in order to identify several of the factors driving the internal distribution of commercial agriculture. Section 5 concludes.

2 Recent land acquisitions in Mozambique

2.1 Global interest in Mozambican agriculture

Before looking at the size and scope of recent land acquisitions in Mozambique, it is helpful to understand the driving factors behind this new surge in investor interest in farmland. Global structural changes throughout the 2000s until the food price peak in 2008 set the groundwork for increased interest in farmland. The increase in food prices over this period was generally a symptom of high energy prices, increasing demand for resource-hungry food (i.e. meat) among the middle classes in low- and middle-income countries, the diversion of land to biofuel production in the US and EU, and commodity speculation (Mittal 2009; Von Braun 2008). Simply put, in a world with high food (and fuel) prices, farming becomes a more attractive activity for international capital.

With respect to Mozambique, interest in land acquisitions appears to be driven by its cheap land, strategic location for exports, and advantageous agro-ecological conditions. For instance, Deininger et al. (2011) estimate the value of land in a large plantation in Mozambique to be US$9,800 per hectare, which is vastly more than the US$1.25 per hectare annual rental fee for cropland. With large potential profits to be made, at least on paper, it is not surprising that by 2009, land requests for biofuel projects exceeded 20 million ha in Mozambique (Arndt et al. 2010). Estimates vary widely for the amount of land actually acquired by large-scale investors in recent years. Whilst Friis and Reenberg (2010) estimate that 10,305,000 ha of land deals were reported in the media between 2008 and 2010, Deininger et al. (2011) cross-check official sources between 2004 and 2009 and estimate that 2,670,000 ha of land was leased to 405 projects. The Land Matrix (2016) reports confirmed land deals of about 1.2 million ha for the period 2008–2010, about 1.4 million ha for the period 2004–2009, and about 2.4 million ha for the entire period covered by their data (2000–2014), which is unlikely to be an overestimate due to the rigorous cross-checking of multiple sources.[1] Indeed, Cotula (2013) suggests that these figures also are likely to underestimate the scale of land acquisitions involving domestic entities, which are often more difficult to track than international deals, as the latter attract more attention.

A further concern with data on land acquisitions is that they do not identify whether operations have begun and/or how much of the acquired land is in use. Deininger et al. (2011) report that a 2009 audit showed that more than 50 per cent of approved agricultural investment projects sampled in Mozambique had either not started any activity or lagged significantly behind their development plan. Although land cannot be privately owned or traded in Mozambique, companies that hold long- or short-term usage rights can be. Current land policy encourages land hoarding for speculative purposes, as land is considered to be extremely cheap (Oakland Institute 2011b). The usage rights for a hectare of cropped farmland cost MZN37.50 (around US$1.25) annually, while rights for pastures and permanent cropland cost even less. Accordingly, to maximize the value of speculative investments, we would expect to see land usage rights acquired in more valuable areas, in particular around urban areas and in those with good-quality agricultural land with freshwater sources.

2.2 Benefits and risks

What do we know about the likely benefits and risks of large-scale land acquisitions? A starting point is the explicit intentions (justifications) of multilateral initiatives such as the G8 New Alliance

[1] www.landmatrix.org (accessed December 2016).

for Food Security and Nutrition, as well as Mozambican projects such as ProSAVANA and the Beira Agricultural Growth Corridor. All these programmes identify spillover effects from large commercial (agribusiness) enterprises to be the central mechanism stimulating growth and development for rural smallholder farmers (Cotula 2013; Deininger et al. 2011; Gurara and Birhanu 2012). Spillover effects variously include an increase in farming knowledge, access to inputs, and direct employment. A further variant is the creation of spatially concentrated 'agricultural clusters' and the use of contract farming to link smallholders to commercial enterprises (e.g. Clements and Fernandes 2012; Kaarhus 2011). The promotion of these alternatives increased as a result of 'land-grabbing' criticisms associated with major projects, in particular ProSAVANA (Nogueira 2013).

The nascent literature on large-scale land acquisitions suggests that a key risk is loss of land use rights by smallholders and/or inadequate compensation for this (Cotula 2013). Mozambique's 1997 Land Law strongly protects the customary rights of local communities and is generally seen as progressive (German et al. 2011; Tanner 2002). In theory, such protection should enable communities to be adequately compensated for land ceded to investors as part of the community consultation process of land deals. However, numerous land conflicts and unfulfilled (and legally unenforceable) promises have been documented in recent years (Borras et al. 2011; Deininger et al. 2011; Nhantumbo and Salomão 2010; Oakland Institute 2011b). For instance, Waterhouse et al. (2010) argue that, in practice, the community consultation process has proved to be highly problematic in Mozambique, with an almost systematic lack of regard for the law in relation to community rights.

It is often assumed that, due to its low population density, Mozambique has vast quantities of unused fertile agricultural land (Deininger et al. 2011). However, it is increasingly recognized that this is not necessarily the case (Kaarhus 2011; Cotula 2013). Borras et al. (2011) state that the argument about existing, available marginal lands is fundamentally flawed, as land can be used in a traditionally extensive way (livestock grazing land and temporary fallow areas), yet still be classified as marginal—i.e. the conventional wisdom that land is 'empty' is often mistaken. Furthermore, Aabø and Kring (2012) argue that when factors such as alternative land use, protected areas, the existence of basic infrastructure, and distance logistics are taken into account, estimates of 'available and suitable' land shrink considerably. The high frequency of conflicts reported in the media in Mozambique certainly suggests that land acquisitions are not taking place on 'unused' or 'marginal' lands. Rather, investors are seeking access to water resources, fertile soil, infrastructure, and proximity to markets (Oxfam 2011), particularly in peri-urban areas (Kaarhus 2011).

Concern has also been raised over the impact of cancelled and delayed projects on communities. Cotula (2013) describes how, when projects collapse, communities lose land without gaining durable benefits, as the government often seeks new investors to continue the project. Such a situation represents a large opportunity cost for the community, as land can subsequently remain idle for a significant time. In Mozambique, after contracts were signed, a 30,000 ha sugarcane plantation in Gaza province was abandoned (Borras et al. 2011), along with at least four biofuel projects in the South and Centre regions totalling over 50,000 ha, among others (Land Matrix 2016).

3 Spatial distributions of commercial farms over time

3.1 Estimations of land use and recent acquisitions

The previous section suggested that the effects of large-scale land acquisitions, and investments in commercial agricultural more generally, are complex. Potential benefits from such investments need to be weighed carefully against the material risks, which may be substantial. However, to date, a lack of evidence on trends in commercial farming, let alone their empirical effects, hampers informed debate. In Mozambique, despite difficulties in ascertaining how much land has been leased, sources presented in Section 2 indicate that usage rights for at least 2.5 million ha have been acquired by private investors for agricultural activities in recent years. Considering that the country has around 36 million ha of arable land, of which only around 6 million ha is currently in use (MINAG 2010), the potential impact on the agricultural sector and current small and medium farm owners is not inconsiderable. In this section, we introduce our dataset of the current distribution of large farms in Mozambique to assess whether these usage rights are being translated into activities 'on the ground'.

The survey data we use represents all farms actively cultivating more than 50 ha of food or cash crops in Mozambique in the years 2002 and 2012. The data was collected as part of the national agricultural surveys (Trabalho de Inquérito Agrícola in 2002; Inquérito Agrícola Integrado in 2012) collected by the Ministry of Agriculture, where local government officials at district level informed the data collectors of any known active large agricultural entities. We retain those farming at least 50 ha of food or cash crops. These incorporate privately owned farms, large household units, and a few other organizational forms, such as state-owned farms and cooperatives. Although a fair few of these farms include those that began production many years before the recent wave of land interest, we can identify the changes in land use between the two periods to assess the impact of recent land acquisitions. The evidence of global land interest presented above makes it fair to assume that most of the changes over this period are attributable to private commercial activity (as opposed to that of state farms, households, or other forms).

Table 1 estimates the number of these large farms and the area they cover. It shows that large farms cultivated around 117,183 ha of crops in 2012. If pastures and land lying fallow are included in this figure, the total area of land of these large farms is 440,691 ha. This compares with around 3.9 million small and medium farm owners cultivating around 4.9 million ha. Between 2002 and 2012, we estimate that the area of usage rights under 'active' large farm ownership increased by 205,065 ha.

The Land Matrix (2016) reports that at least 1.5 million ha (more than 60 per cent of the total) of recent land acquisitions were for forestry projects, implying that just over 1 million hectares (a conservative estimate) have been acquired by investors for farming activities.[2] Comparing the latter figure with the values estimated in Table 1, we see substantial divergence in magnitude.[3] Even if we include fallow land, it would appear that more than half of all commercial land use rights are currently inactive. Indeed, since our data capture farms only that are currently producing or in operation, the large observed discrepancies are likely to be a result of limited or delayed

[2] Similar observations have been recorded for Mozambique elsewhere (Cotula 2013; Aabø and Kring 2012).

[3] Note that land for jatropha production (for biofuels) is not taken into account in our data. This will not distort the results significantly, as the projects are still in the early stages of development, with only around 8,500 ha of crop planted (out of around 400,000 ha approved) by the end of 2012 (CEPAGRI 2012). Strikingly, only 853 jobs have been created out of the 148,225 planned.

implementation, or even outright cancellation, of the projects. Such a finding corresponds with other observations on land acquisitions by Cotula (2013) and the Oakland Institute (2011a), who note how investments are routinely cancelled or unimplemented.

Table 1: Number and area of large farms (>50 ha) in Mozambique

	Annual crops			Permanent crops			Crops combined		
	2002	2012	Δ 02-12	2002	2012	Δ 02-12	2002	2012	Δ 02-12
Number	66	100	34	53	33	-20	117	129	12
Total (ha)	54,693	57,258	2,565	43,905	59,925	15,913	98,598	117,183	18,585
North	5,023	2,386	-2,678	26,520	1,442	-25,078	31,543	3,828	-27,715
Centre	20,947	33,021	12,074	15,173	51,927	36,754	36,120	84,948	48,828
South	28,723	21,851	-6,872	2,212	6,556	4,344	30,935	28,407	-2,528
	Pastures*			Fallow land			Total size		
	2002	2012	Δ 02-12	2002	2012	Δ 02-12	2002	2012	Δ 02-12
Number	45	49	4	58	60	2	117	156	39
Total (ha)	69,855	69,021	-834	67,175	254,487	187,312	235,626	440,691	205,065
North	8,131	2,117	-6,014	10,197	57,068	46,871	49,870	63,012	13,142
Centre	39,739	47,718	7,979	53,710	39,015	-14,695	129,569	171,682	42,113
South	21,985	19,186	-2,799	3,268	158,404	155,136	56,187	205,997	149,810

Notes: Crops combined is the sum of Annual crops and Permanent crops. Total size is the sum of Annual crops, Permanent crops, Pastures, and Fallow Land.

* Pastures are recorded only for farms with more than 50 ha of crops to ensure comparability between years.

Source: Authors' calculations.

3.2 Where are these large farms located?

Our large farms database enables us to map the location of these large farms at the *posto administrativo* level. This is the third level of administrative division, behind province and district. Maps 1–3 illustrate their distribution throughout the country by area, their changes over time, and their distribution by type of farm.[4]

Map 1 shows a discernible pattern for the locations of large farms in 2012. The spatial dispersion of large farms throughout the country is certainly not uniform—it appears that there are indeed areas in which large farms are clustering, particularly around Maputo in the extreme south and within the Beira Corridor in Manica and Sofala. Outside these nuclei, we can see smaller clusters in the North region, noticeably near the Malawian boarder in Tete, around Quelimane in Zambézia, and dotted around Nampula, Niassa, and Cabo Delgado. Pertinently, the *postos administrativos* with large farms tend to be bisected by main roads (denoted by the thick grey lines). Away from these main transport arteries, road conditions are substantially poorer. The absence of large farms in areas away from main roads gives the impression that the poorer market access in these locations is enough of a constraining factor to inhibit investment in and/or the growth of existing farms. The few areas isolated from good transport connections where there are large farm

[4] More detailed maps of the North, Centre, and South regions are included in Appendix A.

clusters (e.g. in north-eastern Tete) are sufficiently close to the borders of other countries to suggest that their principal markets lie outside Mozambique.

Turning our attention to changes in land use by large farms, Map 2 shows significant regional trends over the last 10 years. Activity around the Beira Corridor has clearly increased, along with farming around the main transport corridors of Niassa, Cabo Delgado, and northern Nampula. The South region has seen substantial changes—both increases and decreases. Table 1 shows us that the net increase outweighs the loss of area in the South region considerably, but only when fallow land is taken into account. Falls in land use by large farms are apparent in Zambézia and southern Nampula—a possible response to the lack of integration of these areas into the major growth corridors. Here, roads have been relatively neglected and the efficiency of the closest ports (Quelimane and Nacala) has not been sufficient to make them internationally competitive over this period. The area of large farms in the cluster of *postos administrativos* in north-eastern Tete also increased.

Map 3 shows the type of large farm under operation. We are able to break the data down into three main types: private, households, and 'other' (which comprises state-owned farms, cooperatives, and other shared forms). It suggests that there is no clear pattern to the location of these farms. Yet, it appears that private enterprises are more concentrated in the Centre and South regions, again around the Beira and Limpopo corridors. Households with more than 50 ha of cultivated land are generally found in more remote locations, noticeably in clusters near the Malawian and Tanzanian borders, and in Inhambane.

4 What drives these investments on a local level?

After seeing the spatial distribution of large farms in the previous section, we now turn our attention to the factors driving these placements. Here, we map the distribution of large farms against spatial variables representing (i) the population density of secondary administrative divisions and (ii) the relative welfare of tertiary administrative divisions. Of course, correlation does not imply causality. Yet this analysis should at least enrich our understanding of where larger farms are located, and the associated characteristics of these areas. As a variable to represent welfare, we utilize the 'ranking' of a district based on the multi-dimensional first order dominance approach developed in Arndt et al. (2016). This method takes into account the distribution of the deprivation levels of five welfare indicators—safe water, sanitation, education, electricity, and radio—observed at the district level. Districts are then ranked in respect of their net dominance over other districts (Arndt et al. 2016).[5]

Map 4 displays these district rankings in relation to *postos administrativos* with large farms. Lighter areas represent 'wealthier' districts, while the *postos administrativos* with large farms have a heavier outline. As can be seen, there is a strong clustering of large farms in relatively wealthy areas of Mozambique, particularly in the South region and the central belt along the Beira corridor. Bivariate correlation tests confirm this impression, with resulting negative statistically significant

[5] Following Arndt et al. (2016), a complete welfare ranking of districts is generated by counting the number of times a given district dominates other districts and subtracting the number of times the same district is dominated by other districts. Districts can then be ranked, with higher scores superior to lower scores. All scores are renormalized to fall in the interval [0, 1].

coefficients when district rankings are correlated with all large farms and private large farms (Table 2).

Map 5 shows the distribution of large farms against the population density of each *posto administrativo*, the darker areas representing more densely populated areas. We can see that, in general, large farms are not located in the more sparsely populated areas of the country, the areas in the South and Centre being more densely populated. Noticeably, the seemingly sporadic distribution of large farms in the north-eastern provinces appears to be strongly associated with more densely populated *postos administrativos*. The correlation tests corroborate these findings (Table 2). Table 2 also correlates large farm variables against the presence of paved roads in 2012 and average years of education in 1997.[6] It shows positive correlation with large farm locations in both cases.

Table 2: *Posto administrativo*-level correlation tests

	Posto administrativo has main road in 2012	Population density in 2012	District ranking in 2012	Education level (years) in 1997
If *PA* has a large farm	0.1601	0.1032	-0.1843	0.1557
	(0.0012)	(0.0372)	(0.0002)	(0.0016)
If *PA* has a private farm	0.1560	0.1114	-0.1803	0.2202
	(0.0016)	(0.0244)	(0.0003)	(0.0000)

Notes: Primary results are the correlation coefficients from correlating the presence of a large farm (or private large farm) with a set of posto administrativo-level variables. Significance level in parentheses. All results are statistically significant at the 5% level.

Source: Authors' calculations.

In contrast to the conventional wisdom that large farms are located on marginal lands (Deininger et al. 2011), we have seen that large farms tend to be located in wealthier and better educated areas, with better road access and higher levels of population density. These findings correspond with observations from Mozambique in Kaarhus (2011) and Glover and Jones (forthcoming), who suggest that large farms tend to locate in peri-urban areas with more smallholders. Such a result certainly concurs with economic theory. In these locations, large farms can benefit from a more knowledgeable and plentiful labour force, a larger and wealthier potential market for their produce, and better transport connections. Although causal chains likely run in both directions, it can be argued that the emerging nature of the commercial agricultural sector in Mozambique would not have influenced household characteristics to a substantial degree at this point.

5 Conclusions

This paper has taken stock of the current state of large farms in Mozambique and identified factors influencing their distribution throughout the country. We argued that, despite a growing literature, the nature and impact of land acquisitions and commercial farms remains poorly understood due to insufficient data. This paper contributed to the literature by providing evidence on the current distribution of land used by these entities in Mozambique. Moreover, we found that the scale of

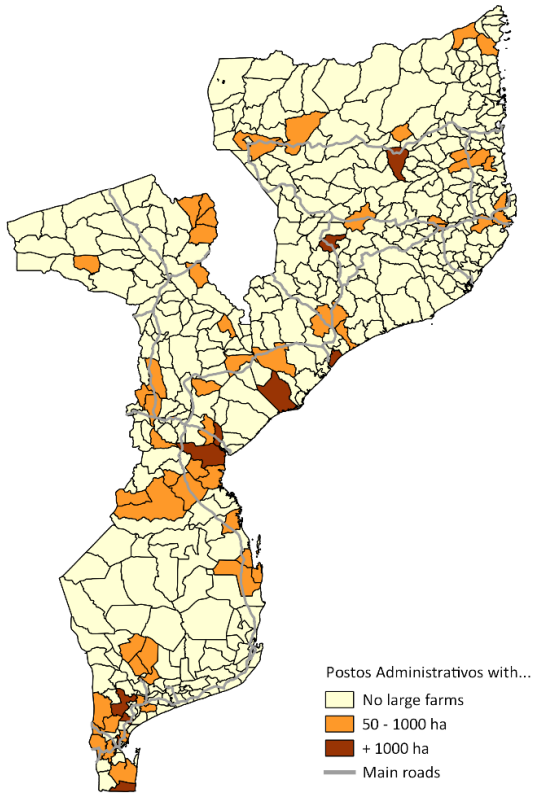
[6] Education levels in 1997 were preferred to current levels, as the former better represent baseline labour force conditions at the time firms would have made their investment decisions.

land acquisitions reported in various sources has not materialized in active operations 'on the ground', which suggests a considerable lag between projects obtaining land usage rights and their implementation.

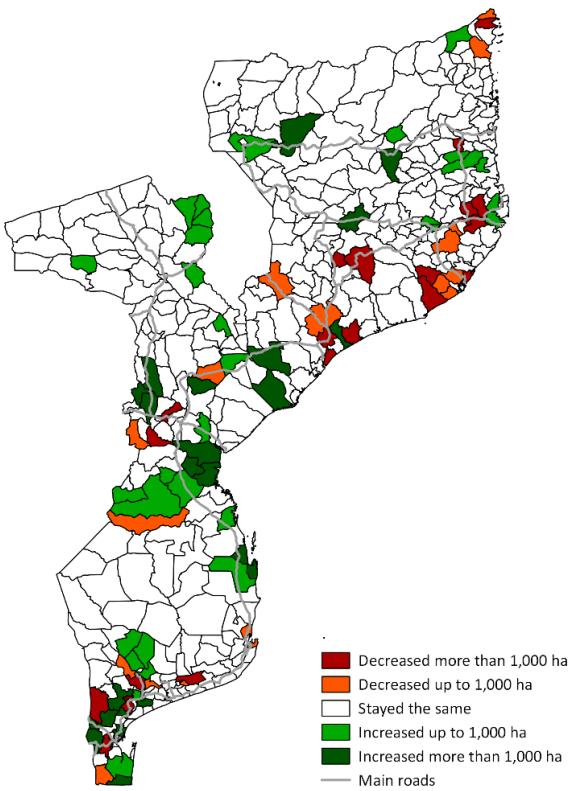
In the Mozambican agricultural sector, much attention over recent years has focused on the promotion of 'agricultural growth corridors'. Particular emphasis has been on the Beira and Nacala corridors, each with its own flagship development project—the BAGC and ProSAVANA. Our findings show that the Beira corridor has witnessed significant progress in terms of attracting larger commercial farms than the Nacala corridor, although ProSAVANA is only currently in the pilot stage. Either way, the Beira corridor currently appears to be the most highly concentrated area of commercial agriculture in Mozambique, and there is evidence (Map 2) that the area of land under cultivation by large farms increased here between 2002 and 2012. Elsewhere, we see some concentration of commercial farming in the extreme south of the country (Limpopo corridor). The point is that such investments are unevenly distributed across the country and we cannot expect all districts to face the same set of opportunities and challenges associated with commercial farming.

In relation to the above clustering of investments, our findings also suggest that large farms generally locate in areas with better infrastructure, higher levels of population, greater wealth, and higher education levels. As a result, one must conclude that simple correlations between large farms and household welfare outcomes (e.g. income) are likely to reflect such selection effects. At this stage, we cannot rigorously identify the consequences of this distribution of investments or their impact on the surrounding population. However, given the increasing volume of investments in the agricultural sector in Mozambique, further research is needed to improve our understanding of these spatial trends, and to shed light on the processes through which large commercial farming entities may influence smallholder agricultural production and rural welfare.

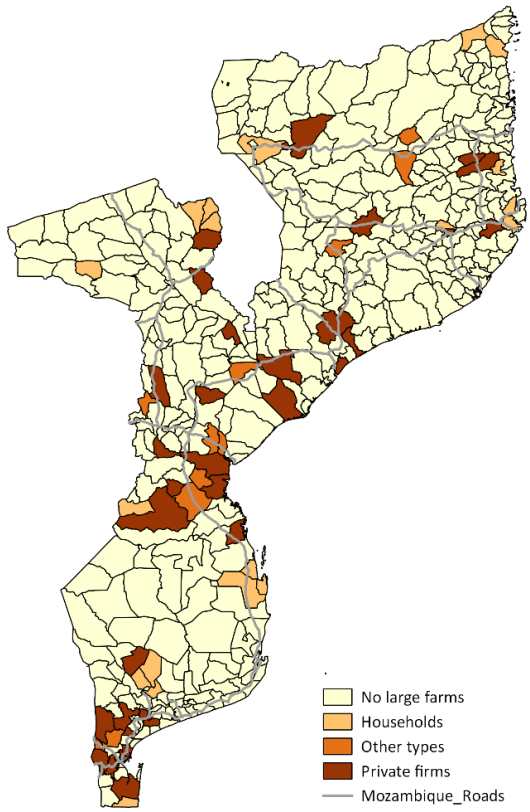
Map 1: Distribution of large farms by area in 2012



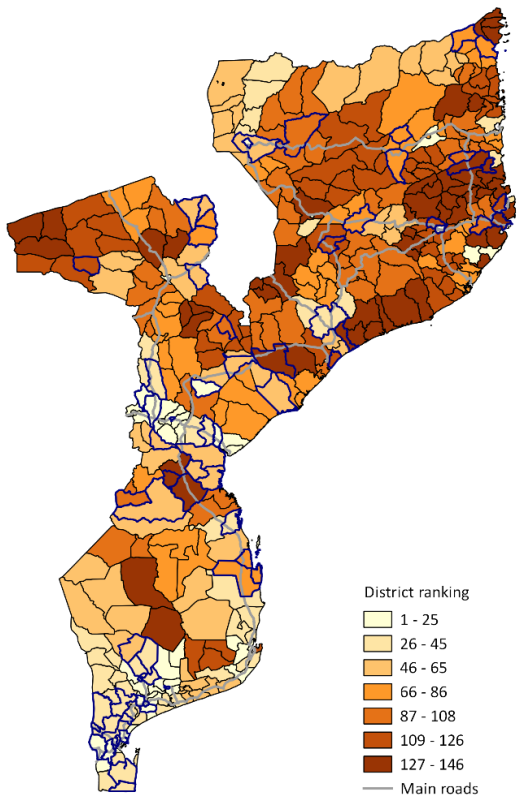
Map 2: Changes in large farms 2002–2012



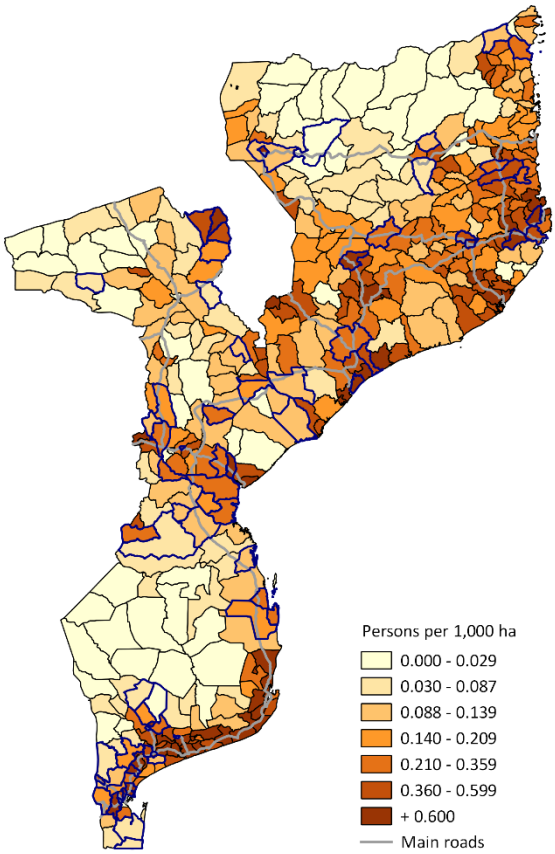
Map 3: Distribution by type of large farm



Map 4: District ranking and large farms in 2012



Map 5: Population density and large farms in 2012



References

Aabø, E., and T. Kring (2012). 'The Political Economy of Large-scale Agricultural Land Acquisitions: Implications for Food Security and Livelihoods/Employment Creation in Rural Mozambique'. UNDP Working Paper 2012-004. Available at: http://www.undp.org/content/dam/rba/docs/Working%20Papers/Agriculture%20Rural%20Mozambique.pdf (accessed December 2016).

Arndt, C., R. Benfica, F. Tarp, J. Thurlow, and R. Uaiene (2010). 'Biofuels, Poverty, and Growth: A Computable General Equilibrium Analysis of Mozambique'. *Environment and Development Economics*, 15(1): 81–105.

Arndt, C., M.A. Hussain, E.S. Jones, V. Nhate, F. Tarp, and J. Thurlow (2012). 'Explaining the Evolution of Poverty: The Case of Mozambique'. *American Journal of Agricultural Economics*, 94(4): 854–72.

Arndt, C., A.M. Hussain, V. Salvucci, F. Tarp, and L.P. Østerdal (2016). 'Poverty Mapping Based on First-Order Dominance with an Example from Mozambique'. *Journal of International Development*, 28(1): 3–21.

Borras, S.M., D. Fig, and S.M. Suárez (2011). 'The Politics of Agrofuels and Mega-land and Water Deals: Insights from the ProCana Case, Mozambique'. *Review of African Political Economy*, 28 (128): 215–34.

CEPAGRI (2012). 'Annual Report 2012: Promoting Sustainable and Poverty-Reduction Investment in Biofuel Production'. Maputo.

Clements, E.A., and B.M. Fernandes (2012). 'Land Grabbing, Agribusiness and the Peasantry in Brazil and Mozambique'. Paper presented at the International Conference of Global Land Grabbing II, 17–19 October, Ithaca, NY. Available at: http://www.cornell-landproject.org/download/landgrab2012papers/Clements_Fernandes.pdf (accessed December 2016).

Cotula, L. (2013). *The Great African Land Grab? Agricultural Investments and the Global Food System*. International African Institute/Royal African Society/World Peace Foundation. London, New York: Zed Books.

Deininger, K., and D. Byerlee, with J. Lindsay, A. Norton, H. Selod, and M. Stickler (2011). *Rising Global Interest in Farmland: Can it Yield Sustainable and Equitable Benefits?* Washington, DC: The World Bank. Available at: http://siteresources.worldbank.org/DEC/Resources/Rising-Global-Interest-in-Farmland.pdf (accessed December 2016).

FAO (2013). *Trends and Impacts of Foreign Investment in Developing Country Agriculture: Evidence from Case Studies*. Rome: UN Food and Agriculture Organisation. Available at: http://www.fao.org/fileadmin/templates/est/INTERNATIONAL-TRADE/FDIs/Trends_publication_12_November_2012.pdf (accessed December 2016).

Friis, C., and A. Reenberg (2010). 'Land Grab in Africa: Emerging Land System Drivers in a Teleconnected World'. GLP Report 1. Copenhagen: GLP-IPO. Available at: http://www.farmlandgrab.org/wp-content/uploads/2010/08/GLP_report_01.pdf (accessed December 2016).

G8 New Alliance (2013). 'Cooperation Framework to Support the New Alliance for Food Security & Nutrition in Mozambique'. Maputo: USAID. Available at: http://feedthefuture.gov/sites/default/files/resource/files/Mozambique%20Coop%20Framework%20ENG%20FINAL%20w.cover%20REVISED.pdf (accessed December 2016).

German, L., G. Schoneveld, and E. Mwangi (2011). 'Contemporary Processes of Large Scale Land Acquisition by Investors: Case Studies from Sub-Saharan Africa'. Occasional Paper 68. Bogor, Indonesia: CIFOR. Available at: http://www.cifor.org/publications/pdf_files/OccPapers/OP-68.pdf (accessed December 2016).

Glover, S., and S. Jones (2016). 'Can Commercial Farming Promote Rural Dynamism in Sub-Saharan Africa?: Evidence from Mozambique'. Working Paper 2016/120. Helsinki: UNU-WIDER. Available at: https://www.wider.unu.edu/sites/default/files/wp2016-120.pdf (accessed December 2016).

Glover, S., F. Tarp, and S. Jones (forthcoming). 'The Role of Agriculture in Structural Transformation in Mozambique'. DNEAP Working Paper. Maputo.

Gurara, D.Z., and D. Birhanu (2012). 'Large-scale Land Acquisitions in Africa'. *Africa Economic Brief*, 3(5): 1–8. African Development Bank.

INE (2016). Available at: http://www.ine.gov.mz/estatisticas/estatisticas-economicas/contas-nacionais/anuais-1/pib_optica_producao.xlsx/view (accessed October 2016).

Kaarhus, R. (2011). 'Agricultural Growth Corridors Equals Land-grabbing? Models, Roles and Accountabilities in a Mozambican Case'. Paper presented at the International Conference of Global Land Grabbing, 6–8 April, Brighton, UK. Available at: http://www.iss.nl/fileadmin/ASSETS/iss/Documents/Conference_papers/LDPI/76_Randi_Kaarhus.pdf (accessed December 2016).

Land Matrix (2016). 'Land Matrix Mozambique'. Available at: http://landmatrix.org/en/get-the-detail/by-target-country/mozambique/ (accessed February 2014).

Li, T.M. (2011). 'Centering Labor in the Land Grab Debate'. *Journal of Peasant Studies*, 38(2): 281–98.

MINAG (2010) 'Plano Estratégico para o Desenvolvimento do Sector Agrário (PEDSA)'. Maputo: Ministry of Agriculture.

Mittal, A. (2009). 'The 2008 Food Price Crisis: Rethinking Food Security Policies'. G-24 Discussion Paper Series 56. NY and Geneva. Available at: http://unctad.org/en/Docs/gdsmdpg2420093_en.pdf (accessed December 2016).

Nhantumbo, I., and A. Salomão (2010). 'Biofuels, Land Access and Rural Livelihoods in Mozambique'. London: IIED. Available at: http://pubs.iied.org/pdfs/12563IIED.pdf (accessed December 2016).

Nogueira, I. (2013). 'Agricultural Systems with Pro-poor Orientation in Mozambique? ProSAVANA and the Forgotten Risks of Contract Farming'. Paper presented at UNU-WIDER Conference on Inclusive Growth in Africa: Measurements, Causes, and Consequences, 20–21 September, Helsinki. Available at: http://unige.ch/sciences-societe/ideso/files/3414/0723/5650/NOGUEIRA_Wider_draftpaper.pdf (accessed December 2016).

Oakland Institute (2011a). 'Understanding Land Investments in Africa – Land Deal Brief: The Myth of Economic Development'. Oakland, CA. Available at: https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/OI_brief_myth_economic_development_0.pdf (accessed December 2016).

Oakland Institute (2011b). 'Understanding Land Investments in Africa – Country Report: Mozambique'. Oakland, CA. Available at:

https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/OI_country_report_mozambique_0.pdf (accessed December 2016).

Oxfam (2011). 'Land and Power: The Growing Scandal Surrounding the New Wave of Investments in Land'. Oxford: Oxfam. Available at: https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bp151-land-power-rights-acquisitions-220911-en_4.pdf (accessed December 2016).

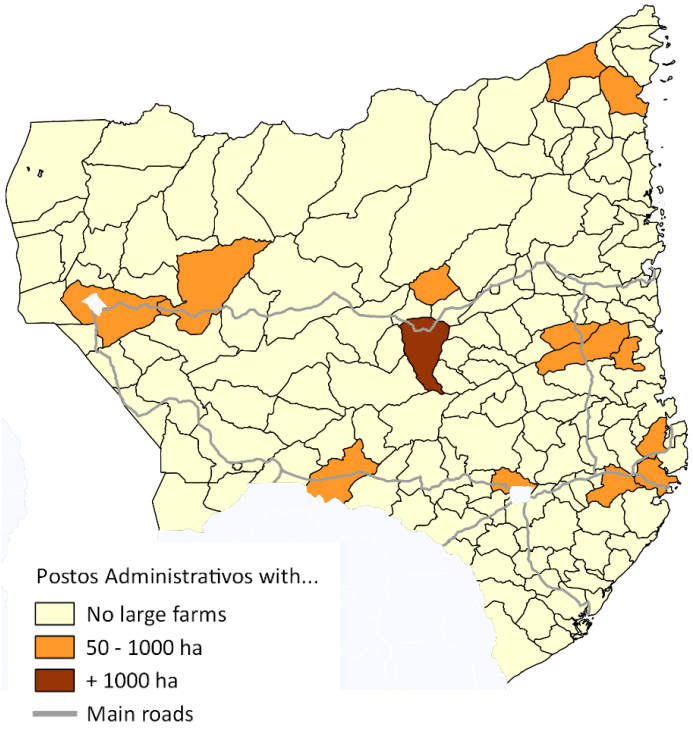
Tanner, C. (2002). 'Law-making in an African Context: The 1997 Mozambican Land Law'. FAO Legal Papers Online 26. Rome: FAO. Available at: http://www.fao.org/3/a-bb059e.pdf (accessed December 2016).

Von Braun, J. (2008). 'Rising Food Prices: What Should Be Done?' IFPRI Policy Brief, April. Washington, DC. Available at: http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/9235 (accessed December 2016).

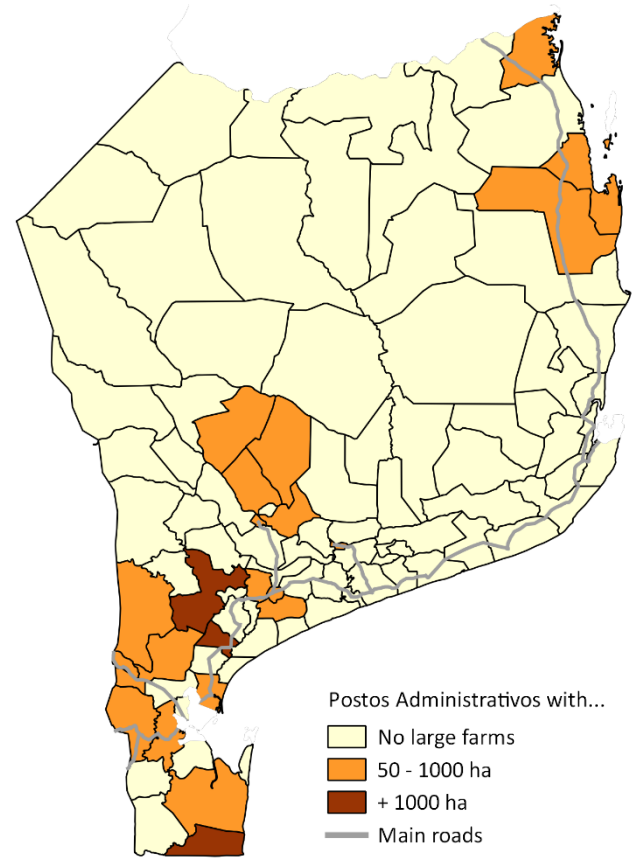
Waterhouse, R., G. Lauriciano, and S. Norfolk (2010). 'Social Analysis of Selected Projects – Issues Note & Case Studies: Large-scale Land Acquisition for Agricultural Production Mozambique'. Background paper to *Rising Global Interest in Farmland*, World Bank, Draft, 19 March. Available at: http://www.open.ac.uk/technology/mozambique/sites/www.open.ac.uk.technology.mozambique/files/pics/d128185.pdf (accessed December 2016).

Appendix A: Maps of North, Centre, and South regions

Map A1: Distribution of large farms by area in 2012, North

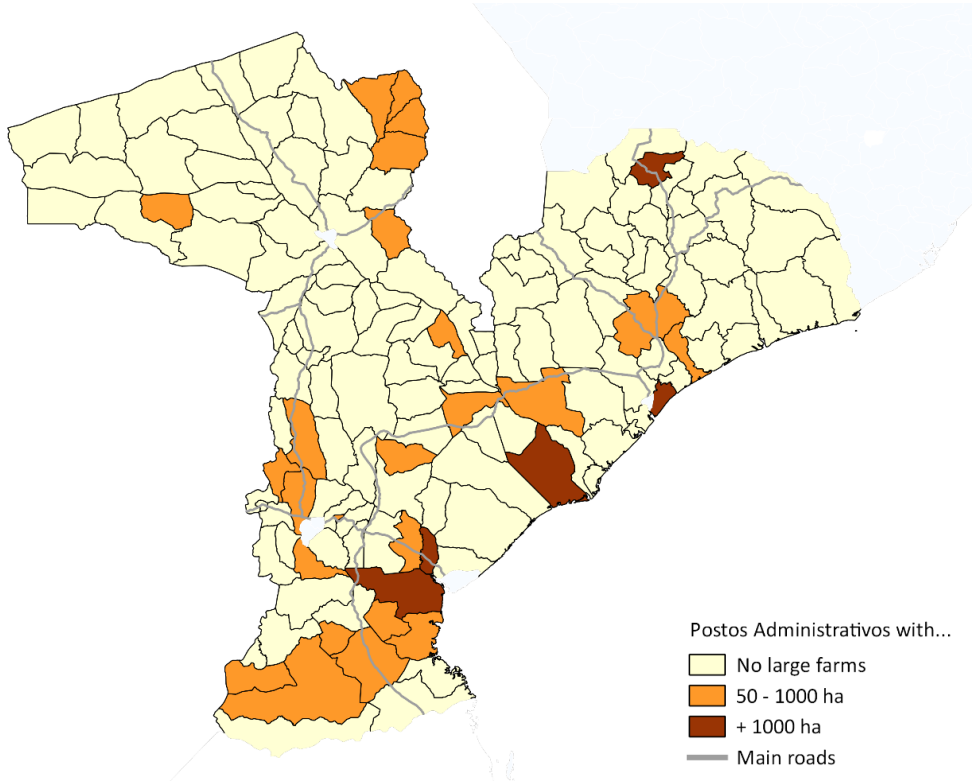


Map A2: Distribution of large farms by area in 2012, Centre

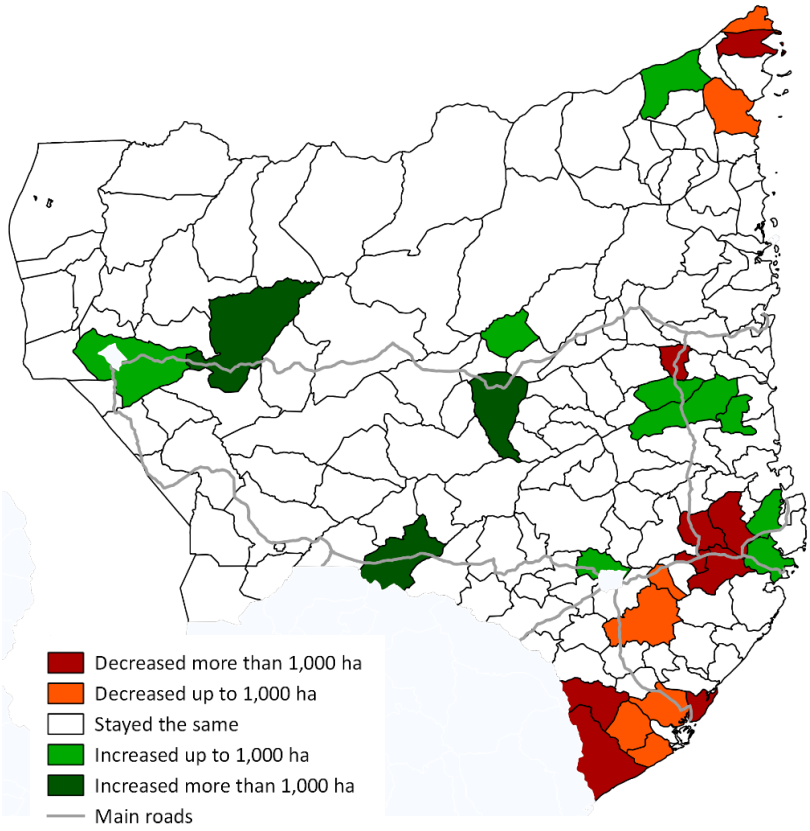


Note: Provincial capitals are left blank.

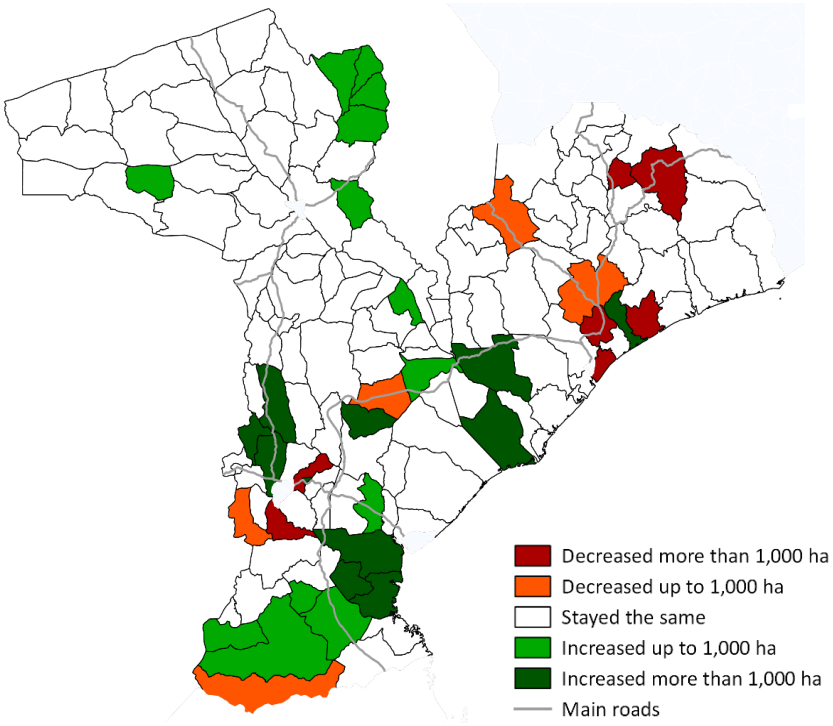
Map A3: Distribution of large farms by area in 2012, South



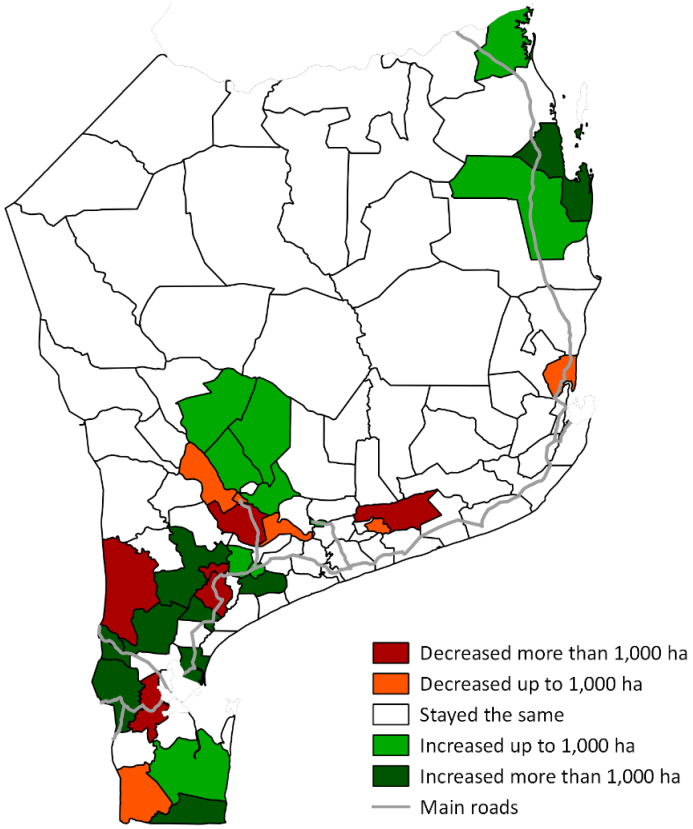
Map A4: Changes in large farms 2002–2012, North



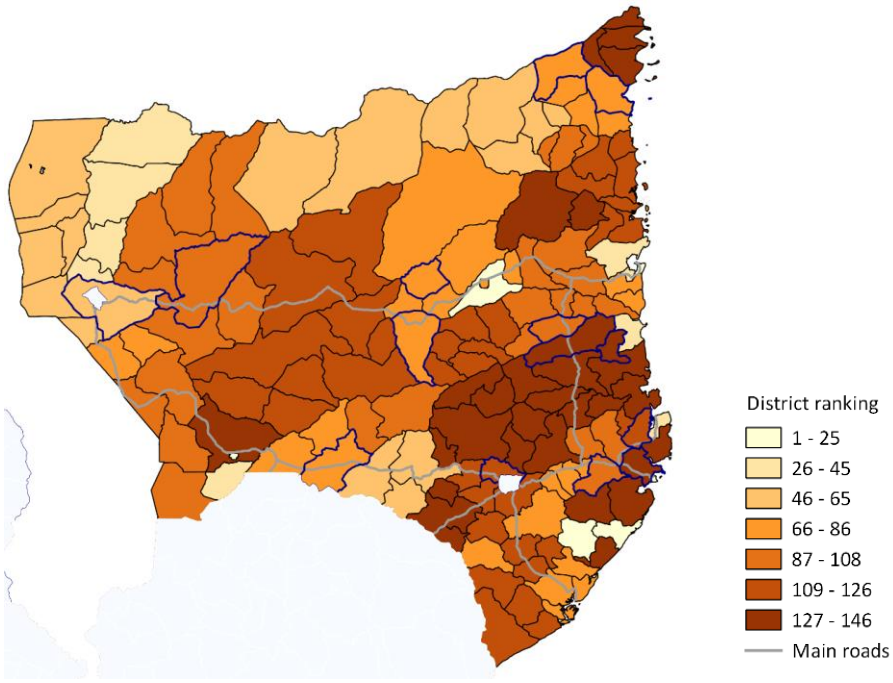
Map A5: Changes in large farms 2002–2012, Centre



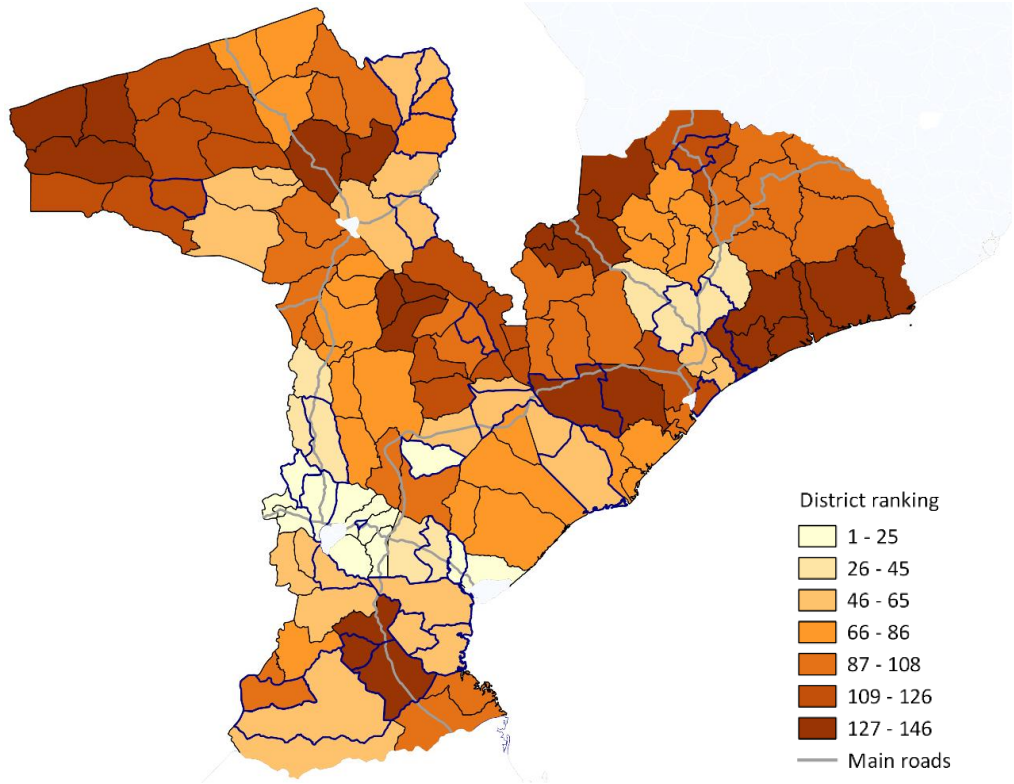
Map A6: Changes in large farms 2002–2012, South



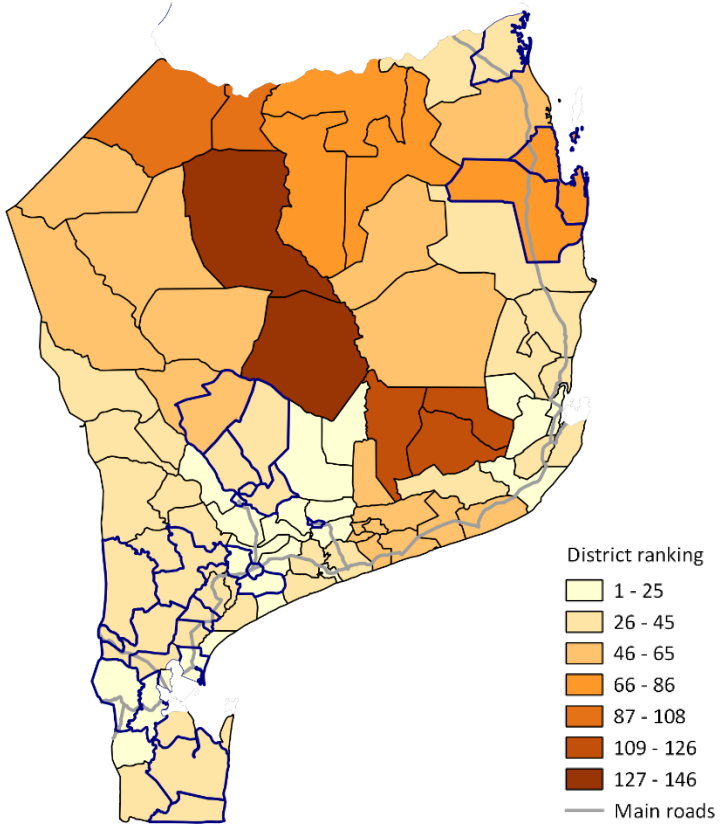
Map A7: District ranking and large farms 2002–2012, North



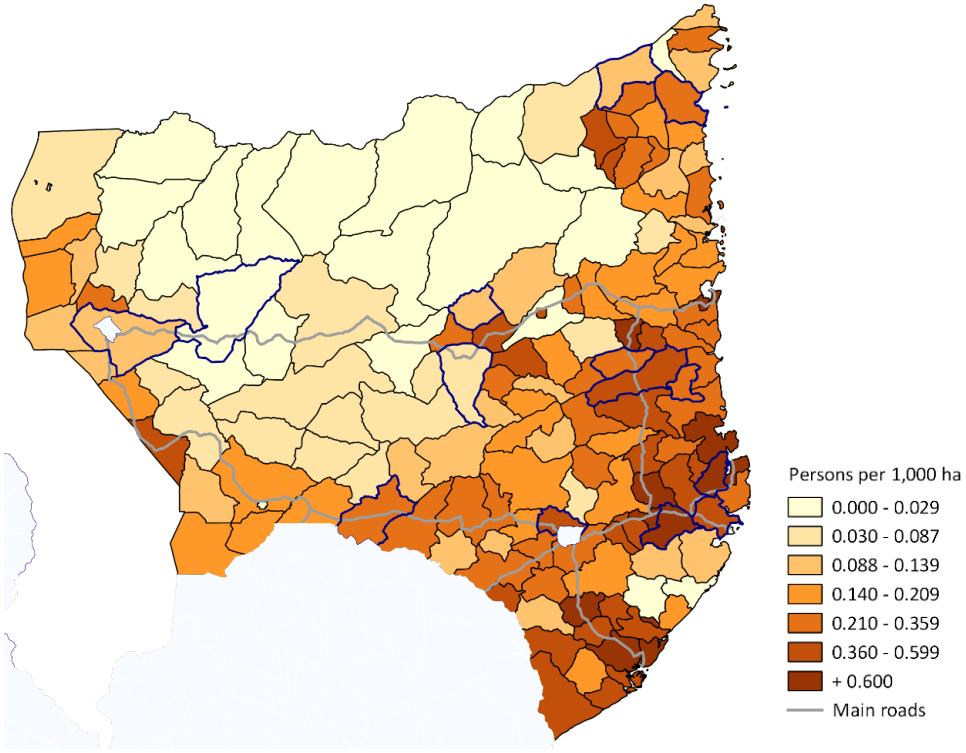
Map A8: District ranking and large farms 2002–2012, Centre



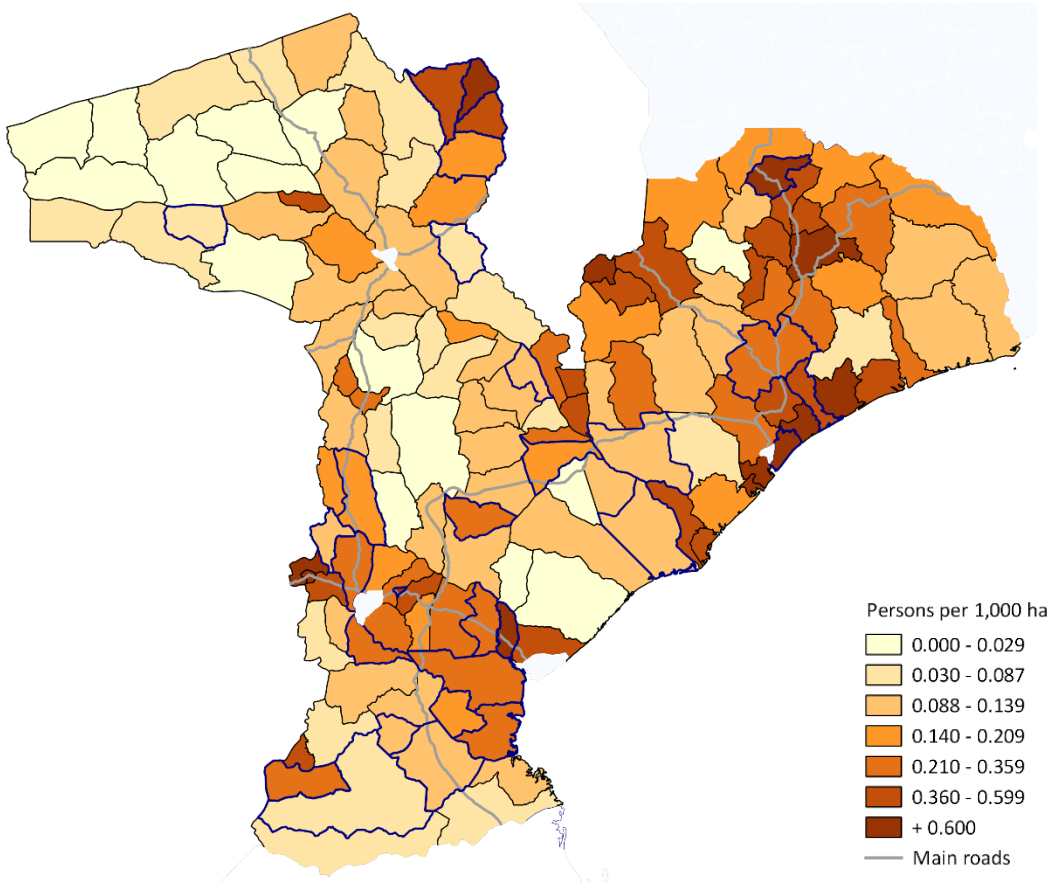
Map A9: District ranking and large farms 2002–2012, South



Map A10: Population density and large farms 2002–2012, North



Map A11: Population density and large farms 2002–2012, Centre



Map A12: Population density and large farms 2002–2012, South