



Hunger in the former
apartheid homelands:
Determinants of converging
food security 100 years after
the 1913 Land Act

Dieter von Fintel and Louw Pienaar



A critical determinant of the success of any poverty alleviation strategy is the extent to which it promotes food security amongst the most vulnerable in society.

Introduction

The year 2013 marked the centenary of the enactment of the 1913 Natives Land Act in South Africa. This Act still dominates public debate, as it laid the foundation for the formation of apartheid homelands and separate development. By 1994, the formalities of apartheid legislation, including the Land Act, had been dismantled, though many of the legacies of separate development remain. This article assesses the impact of post-apartheid rural and agrarian development, using linear probability models of the prevalence of household hunger, and of the historic context and impact of the Land Act 100 years after its inception. As illustrated in the empirical section, differences in hunger levels between homeland and non-homeland regions were eliminated by 2008. The article assesses the role that agriculture played in this progress, as well as the role played by government social assistance to households.

One of the sectors still heavily impacted on by the effects of the Act is agriculture. South Africa is afflicted by high levels of unemployment, which, together with low levels of subsistence farming and informal employment, threaten socio-economic well-being and, in particular, food security of its households. These are consequences of many historical factors, among others the Land Act and the Group Areas Act, which limited the freedom of black South Africans to acquire land and engage in economic activity in the geographic areas of their choice.

This article starts with a review of the state of food security in South Africa, followed by a historical contextualisation of farming since the 19th century in South Africa, and then proceeds to provide a current assessment of farming in the former homeland areas. Food security within these areas will be analysed, together with the agricultural background, in an attempt to gauge the impact of post-apartheid policy interventions and of farming on food security. As late as 2004 (ten years after the abolition of legislated apartheid), differences in food security persisted between former homeland regions and other parts of South Africa. The homelands were created on the basis of the demarcations of the Land Act and, 90 years later, were still distinct in terms of relative food insecurity. However, as the evidence shows, many of these differences were eliminated by 2008. We conclude with a discussion of policy issues to establish whether the current trajectory of progress is sustainable into the future.

Food security and agriculture

Although an upper-middle income country, South Africa is afflicted by extremely high levels of absolute poverty and is

often referred to as one of the most unequal countries in the world (Pauw 2007). Poverty is pervasive, but particularly acute in rural areas (Dercon 2009), with the former homeland regions, where 65 per cent of the poor are located (Machethe 2004), the worst affected. Many South African rural inhabitants are linked either directly or indirectly to agricultural activities (Pauw 2007) and, in theory, agriculture should thus provide vital income and employment for rural inhabitants, as is the case in many other African countries (Ojediran 2011).

A critical determinant of the success of any poverty alleviation strategy is the extent to which it promotes food security amongst the most vulnerable in society (Altman, Hart & Jacobs 2009). Simply explained, food security refers to the ability of an individual to obtain or have access to sufficient food (Du Toit 2011). Its measurement, however, has become a complex exercise because of the multiple definitions and indicators that exist in a wide range of disciplines (Altman et al. 2009).

Household food security is heavily dependent on the income and the asset status of the household (Jacobs 2009). Other determinants of household food security are household composition, livelihood strategies and geographic location. Households typically access food through subsistence production, markets, government transfers or other households (Baiphethi & Jacobs 2009). It is well known that rural households historically produced most of their own food, but recent evidence suggests that there is an increase in market dependence of both urban and rural households (Baiphethi & Jacobs 2009). According to Baiphethi and Jacobs (2009), greater household food production has the potential to improve the food security of poor households because of the lower exposure to food inflation in the market. Agriculture, in addition, has proven to be a crucial mechanism for rural growth and poverty alleviation (Birner & Resnick 2010; Diao, Hazell & Thurlow 2010). However, in the context of its declining long-term share in the economy, and given the constraints imposed by a century of restrictive legislation, there are significant obstacles to the revival of this form of livelihood. The combined effects of political, economic, social and historical factors have resulted in duality within the sector (Essa & Nieuwoudt 2003). Thus, rural livelihoods in South Africa today are marked by ever-present legacies of poverty, which are both racially and spatially defined (Neves & Du Toit 2013).

The post-apartheid government has directed large amounts of public spending towards rural development and poverty alleviation. Currently, a significant share of public spending is devoted to social grants and improved services in these poor regions (Perret, Anseeuw & Mathebula 2005). Yet, progress

in the improvement of rural livelihoods has been limited, as many of the policy interventions, such as land reform, small-holder support and rural development, have been ineffective (Perret et al. 2005). Indeed, Hoogeveen and Özler (2004) show that poverty increases in the years immediately after the end of apartheid were concentrated in rural homeland regions.

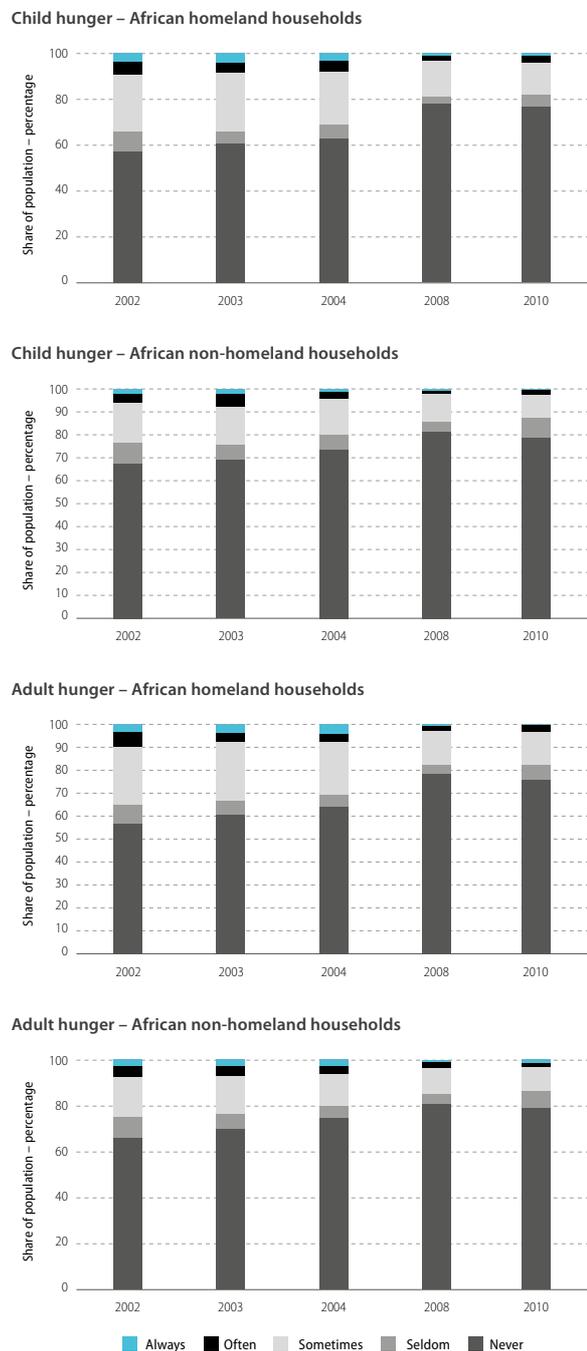
In the early post-apartheid years, academics actively monitored whether reforms had led to an improvement in household welfare. While Census (1996 and 2001) and Income and Expenditure Survey (1995 and 2000) data showed that poverty had increased in the first half decade after transition (Hoogeveen & Özler, 2004; Leibbrandt, Levinsohn & McCrary (2005); Ardington, Lam, Leibbrandt & Welch 2006), alternative sources showed that it had actually declined, and that steady improvements in welfare continued to be made (Van der Berg, Louw & Yu 2008). Notably, Van der Berg et al. cite the decline in reported hunger in the General Household Survey (GHS) as a firm indicator of declining poverty. Figure 4.1 exploits the same data source, but differentiates hunger trends by whether households resided in former homelands or not.¹ It is evident that regardless of location, hunger declined for both adults and children in the post-2000 decade. It is also notable that hunger was initially higher in former homeland regions, but that the decline in prevalence thereof was much quicker here, so that hunger levels converged between regions. The question is how this differential in food security across homeland and non-homeland regions was eradicated in the period of a decade. One possible explanation is the rapid expansion of social grants, as emphasised by Van der Berg et al. (2008) to substantiate a declining poverty trend. While they do not establish this link formally, they infer a link between declining poverty and better food security, and (more pertinently) the expansion of grants in establishing both. Here we try to quantify the impact of household agricultural activities on improvements in food security, while also controlling for the importance of social grants, in order to understand which of the policies had greater effect.

A brief historic overview of African farming in South Africa

The history of South African agriculture revolves around two core themes: land ownership and land rights (Tihanyi & Robinson 2011). Agriculture in the mid-19th century consisted of large white-owned settler farms with hired labour, some settler estates with indigenous tenant farmers and free indigenous farmers farming on black-owned land (Lahiff 2000; Mbongwa, Vink & Van Zyl 2000).

Before the establishment of the Union of South Africa, African farming was relatively viable during the second half of the 19th century. African farmers at the time, whether farming on private land or as tenants, proved competitive with large-scale settler farmers. According to Bundy (1979) these African farmers supplied major towns with grain and exported surplus

Figure 4.1: Changes in hunger patterns for African households by former homeland status



Source: Own calculations from General Household Survey (GHS) (2002, 2003, 2004, 2008, 2010)

to the Cape between 1850 and 1870. Compared to large-scale farming, the African family farming units were efficient in producing agricultural products with simple technologies and plentiful land. Labour was said to be the most important success factor in farming at the time, and white settlers with low profitability could not offer wages that would attract indigenous labourers, who could choose rather to live off subsistence farming (Mbongwa et al. 2000). White landowners, therefore, depended heavily on rental payments from successful black tenant farmers (Oettle, Fakir, Wentzel, Giddings & Whiteside 1998).

The ultimate inability of white farmers to compete with black farmers resulted in the large settler farmers persuading the colonial government of the time to intervene on their behalf. The interventions were designed to limit African competition in the marketplace and to establish native reserves to create artificial land shortages. These shortages forced African farmers to seek work on farms, enabling settlers to attain profitability. Measures that were used included various taxes (poll taxes on livestock and huts), road rents, location, vagrancy and pass laws and enforced confinement to the reserves that were allocated to Africans (Mbongwa et al. 2000).

The 1913 and 1936 Land Acts of the Union of South Africa enforced *complete* discrimination in access to acquiring land (Mbongwa et al. 2000). This effectively prohibited black people from acquiring land anywhere outside of boundaries stipulated by the Acts, and made farming possible only in the allocated reserve areas (Lahiff 2000). In contrast, 87 Acts were passed in the Union parliament which supported the needs of white commercial agriculture between 1910 and 1937 (Mbongwa et al. 2000). The apartheid government further entrenched these patterns. In the 1960s and 1970s, policy towards the regulation of the reserve areas was revised, and around 3.5 million people, including tenants evicted from white farms, were forcefully evicted to the homelands (Lahiff 2000).

Post-apartheid policy changes in the agricultural sector included the deregulation of the marketing system, abolishment of certain tax concessions, reduction in expenditure via the national budget, land reform, trade reform and new labour legislation (Groenewald & Nieuwoudt 2003). The African National Congress (ANC) stipulated that the improvement of small-scale agricultural production and increased participation of emerging farmers in the economy were among the pillars of the Reconstruction and Development Programme (RDP) (Makhura & Mokoena 2003). The general aim of the new agricultural policy was to create a unified economy, where both large and small farming enterprises could compete in harmony in the domestic and international markets (Van Averbeke & Mohamed 2006).

Towards undoing the effects of decades of policies that affected black South Africans, the new government initiated a series of land reform programmes in 1994, with the intention of redistributing 30 per cent of total agricultural land to the previously disadvantaged. These reforms were intended to

make land accessible to rural people, provide for security of tenure, and improve small-scale production capacity (Lyne & Darroch 2003).

Data, methodology and descriptive analysis

Data and descriptive analysis

This section illustrates the current situation with regard to farming and food security in the former homeland areas of South Africa. Smallholder African farmers are settled predominantly in the former homeland areas, which comprise approximately 13 per cent (16 million hectares) of the country's total agricultural land (Fenyés & Meyer 2003). Agriculture in these areas is commonly known for its subsistence orientation and is extremely marginalised in comparison with the commercial sector (Lahiff 2000). Production is aimed mostly at providing staple foods for household consumption, which can be grown anywhere from gardens to demarcated fields and open rangelands.

To understand the current state of subsistence farming and food security in these areas better, the GHS has been used to capture a static picture for 2010. Considering the lack of data on smallholders, and, more specifically, subsistence farming in many datasets,² the GHS of 2010 was selected as the most comprehensive to date. In later analysis, additional years of this survey are added, but the sample is limited to variables that are consistently enumerated over time.

To be able to assess and describe subsistence farming, this article exploits Geographic Information Systems (GISs) to locate the former homeland areas in South Africa with information from the Department of Rural Development and Land Reform (2004). This indicates the former homeland areas as they were spatially administered during the apartheid regime, following the first demarcations under the Land Acts of 1913 and 1936. Census Enumerator Area (EA) and Primary Sampling Unit (PSU) (which can be identified in the GHS from 2008 onwards) layers are used to locate households situated within the former homeland areas of South Africa. The EA is the smallest geographical unit used to enumerate or divide a country for census purposes, dividing sub-places into small areas consisting of no more than 185 dwelling units (Mokgokolo 2011). The former homeland households were sampled by selecting EAs whose central points are inside the boundaries.

The former homeland areas consisted of 10 distinct 'states', which took up 13.96 per cent of the total 122.1 million hectares of land in South Africa. Out of the ten former 'states', the Transkei area was the biggest with 4.42 million hectares, followed by Bophuthatswana and KwaZulu with 3.80 and 3.61 million hectares respectively (see Table 4.1).

A breakdown of the sample used in the study is displayed in Table 4.2. It includes all black South African households sub-divided into homeland and non-homeland areas.

Former homeland 'states'	Hectares	Percentage of total RSA
Transkei	4 426 338	3.63
Bophuthatswana	3 801 642	3.12
KwaZulu	3 606 063	2.96
Lebowa	2 217 131	1.82
Ciskei	799 223	0.66
Gazankulu	739 838	0.61
Venda	648 729	0.53
Kangwane	351 214	0.29
Kwandebele	325 893	0.27
Qwaqwa	104 985	0.09
Total area	17 021 056	13.96

Source: Own calculations from Department of Rural Development and Land Reform (2004)

	All black homeland households		All black non-homeland households		Total
	Survey	Population	Survey	Population	
GHS 2010					
South Africa	9 845	4 794 694	9 826	5 901 897	10 696 591
Involved in farming	4 788	2 191 252	1 257	686 584	2 877 836

Source: Own calculations from GHS (2010)

Note: Population figures are weighted by sampling weights

Approximately 4.79 million black individuals reside in the former homeland areas, of which 2.19 million are involved in agricultural production. Substantially fewer black farming households (approximately 686 000) were located outside of the homeland areas. Of these, the majority were urban inhabitants: only 28 per cent of the households were listed as living in rural or tribal areas. Yet, when these two farming groups are compared, we see that there are already significant differences between those in the former restricted areas and those outside.

Table 4.3 indicates key differences between black farming households in South Africa across regions. African homeland households were, on average, more advanced in age, had lower education and were more likely to be headed by females compared to their non-homeland counterparts. Important differences are also manifest in terms of household incomes, with homeland households having a much lower salary income of R1 446.29 per month compared to the R2 979.79 of non-homeland households. This shows that non-homeland farming households have greater access to salary income, while homeland households have typically higher dependence on (lower) government social grants.

On average, with two recipients, homeland households received about R1 000 in total grants per month. Non-homeland households received an average of only one grant per month,

amounting to roughly R630.00. The main grants for homeland households were old age grants, reflective of the many elderly people who reside there, and the families that are dependent on them for livelihoods. Another important source of income was remittance payments, which averaged R214.00 for homeland households compared to the non-homelands figure of R143.00.

Figure 4.2 adds a time dimension, and illustrates that social grants played a progressively greater role as a main source of income for African households in homeland and non-homeland regions. However, the expansion was much larger in former homelands, with the role of remittances and labour income waning over time in these regions.

Variable	Unit	All African homeland households	All African non-homeland households
Age of head	years	52.01	46.96
Education of head	years	5.77	7.29
Gender of head	% male	0.49	0.63
Household salary income	rand	1 446.29	2 979.79
Household remittance income	rand	213.97	143.16
Household grant income	rand	1 000.15	632.01
War veterans' grant	rand	2.71	1.30
Child support grant	rand	364.19	219.38
Care dependency grant	rand	7.86	3.54
Foster care grant	rand	37.92	37.80
Grant-in-aid	rand	0.03	0.00
Disability grant	rand	132.40	127.32
Old age grant	rand	455.07	242.67
Household size	number	4.68	4.03
Grant receivers in Household	number	2.06	1.27
Economically active in Household	number	0.54	1.02
Elderly living in Household	number	0.29	0.15
Total observations	n	2 191 252	686 584

Source: Own calculations from GHS (2010)

Note: Figures are weighted by sampling weights

Moving now into a more detailed analysis of farming in the former homeland areas of South Africa, Table 4.4 provides descriptive statistics related to farming. The sample is limited to households that indicated that they had access to land for farming. The main source of income was government grants for 49 per cent of African farming households, while salaries and remittances ranked second and third with 24 per cent and 16 per cent respectively. This suggests that the farming activities themselves did not provide sufficient means for a

livelihood in former homeland regions. These households (79 per cent of the total) produced agricultural products mainly as an extra source of food for the households; only 6 per cent did so for their main food supply. Together, this still highlights a fragile small-scale farming sector, on which households could not rely.

In terms of land ownership, most of the households involved in crop farming indicated that they owned the land. This was typically because many of these farmers were listed as backyard farmers. Yet, adding the number of households farming on tribal land to those that keep livestock for communal

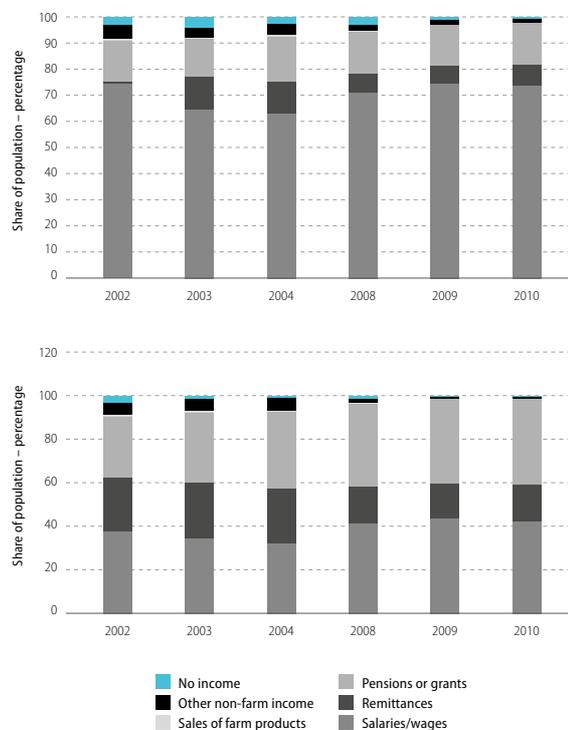
Table 4.4: Description of homeland farming

Variable	Sample	Population	Percentage
<i>Main income source</i>			
Grants	2 456	1 077 192	49.16
Salaries	1 075	520 621	23.76
Remittances	736	351 562	16.04
Income from a business	222	105 651	4.82
Pensions	51	20 753	0.95
No income	19	11 090	0.51
Other income sources	25	11 043	0.50
Sales of farm products and services	17	7 691	0.35
<i>Why produce?</i>			
Extra food source	3 846	1 746 593	79.71
Main food source	284	137 975	6.30
Extra income source	196	84 229	3.84
Leisure activities	111	53 958	2.46
Main income source	48	22 599	1.03
<i>Land ownership</i>			
Owns the land	2 175	922 137	42.08
Communal grazing	1 491	700 377	31.96
Tribal authority	1 021	517 808	23.63
Other (specify)	11	6 662	0.30
Sharecropping	11	6 059	0.28
Rents the land	11	5 537	0.25
State land	9	5 285	0.24
<i>Sell produce</i>			
Do not sell	4 194	1 916 630	87.47
Local buyers from this district	223	101 654	4.64
Buyers from neighbouring cities and towns	21	10 988	0.50
Formal markets in South Africa	19	4 591	0.21
Other	9	3 757	0.17

Source: Own calculations from GHS (2010)

Note: Population figures are weighted by sampling weights

Figure 4.2: Main household income source by homeland status (non-homeland above, homeland below)



Source: Own calculations from GHS (2002, 2003, 2004, 2008, 2009, 2010)

grazing, more than 50 per cent of the black farming households did not have title deeds to land for farming. This serves as a reminder of the persistent impact of the Land Acts on these households.

Figure 4.3 highlights that homeland households were more likely to participate in some form of farming than were African non-homeland households. In terms of farming, the composition of land rights changed substantially, so that the low levels of ownership highlighted for 2010 represent an improvement on the past situation. While homeland farmers cultivated tribal lands (which they did not own), ownership grew dramatically among this group towards 2010.

Land size (hectares)	Sample	Population	Percentage
<0.5	2 791	1 244 983	56.82
0.5–1.0	311	154 414	7.05
1.0–2.0	102	50 496	2.30
2.0–5.0	31	12 298	0.56
5.0–10.0	3	1 481	0.07
10.0–20.0	2	669	0.03
>20.0	5	2 281	0.10
Did not know	7	3 070	0.14
Communal grazing (livestock)	1 491	700 377	31.96

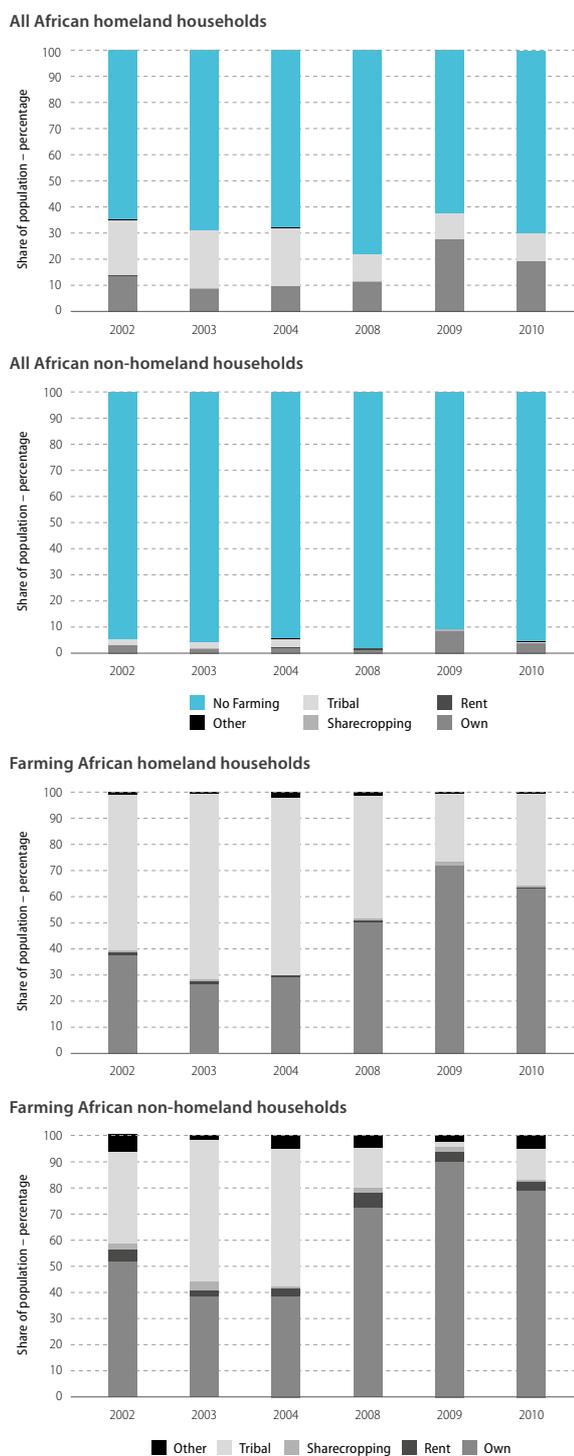
Source: Own calculations from GHS (2010)
 Note: Population figures are weighted by sampling weights

Results from regression analysis

Using data from the 2010 GHS, this analysis continues with linear probability models,³ which aim to identify the factors that are associated with the prevalence of hunger within households.⁴ It seeks to understand whether household agriculture has a significant role to play in combating hunger and promoting food security in the former apartheid homelands, or whether other forms of economic activity or social grants have been the most important contributors to food security in these regions.

In Tables 4.6–4.8, each column represents a separate Ordinary Least Squares regression. Because the dependent variable is binary, each of the coefficients can be interpreted as the marginal increase in the probability of hunger associated with that characteristic, or the marginal difference relative to the base group. Hence, negative coefficients highlight household characteristics that are good for food security. Should the introduction of another variable to the model result in a coefficient that was initially statistically significant becoming insignificant, we know that there is a large degree of correlation between the new variable and the previously significant variable. For example, more concise models control for whether the household was found in a former homeland, which highlights

Figure 4.3: Black households' land tenure by former homeland status



Source: Own calculations from GHS (2002, 2003, 2004, 2008, 2009, 2010)

a statistically larger incidence of hunger (see for instance column 1 of Table 4.6). However, controlling for income types, this homeland effect becomes statistically insignificant, so that the mechanism through which this type of household suffers from more hunger can be 'explained' by the unfavourable composition of income in former homeland regions. The rest of the analysis offers similar arguments. It is to be noted, however, that some of the associations discussed here should not be interpreted causally – this danger will be indicated when relevant.

Table 4.6 investigates the prevalence of adult hunger among all black households in South Africa.⁵ Specification 1 shows that in 2010 former homeland regions still experienced statistically significant higher levels of hunger than did non-homeland regions (though the magnitude is small), with a 0.8 percentage point difference.⁶

Specification 2 proceeds to control for a set of indicators that denote the main income source of the household. Most importantly, as mentioned above, the homeland effect is reduced to statistical insignificance, so that the uneven distribution of various income types across these regions explains the difference (as depicted in Figure 4.2). Relative to salaried households, households whose main income stems from grants and remittances register significantly higher levels of hunger. This is not to say that grants and remittances cause hunger to be higher, it simply suggests that households that depend on these forms of income are at a disadvantage relative to households with direct connections to the labour market. The sale of farm products places households at a distinct advantage relative to households that derive income mainly from salaries, which suggests that the role of commercial agriculture is not only important for the generation of income, but has direct food security impacts.

Specification 3 differentiates between these associations in terms of whether households are located in homeland areas or not. The main effects represent non-homeland regions, while the interactions show whether there are significant differences for households in former homelands relative to non-homeland regions. Notably, the absence of an income in a former homeland has a more substantial impact on a household than is the case in non-homeland areas. In such instances, the prevalence of hunger is 10 percentage points higher in homeland than in non-homeland regions, which points to the fact that former homeland households are less exposed to alternatives that can offer food security. However, households that are dependent on remittances and grants have a lower probability of experiencing hunger when they reside in homeland regions, which suggests a high level of dependence on these income sources there (see Figure 4.2). By extension, they also play a critical role in mitigating hunger.

Specification 4 explores the role of agriculture more deeply in terms of a household's stated purpose for engaging in food production. The results show that in non-homeland regions, households that farm for a main source of food are about

Table 4.6: Linear probability models of adult hunger by household (1)					
Dependent variable: Adult hunger dummy		1	2	3	4
Main income source (base: salary)	Homeland dummy	0.008**	-0.003	0.005	0.012***
	Remittances		0.043***	0.065***	
	Pensions/Grants		0.034***	0.042***	
	Sale of farm products		-0.018***	-0.018***	
	Other non-farm income		0.030*	0.023	
	No income		0.146***	0.107***	
Interaction of main income source with homeland	Remittances			-0.040***	
	Pensions/Grants			-0.015*	
	Sale of farm products			-0.005	
	Other non-farm income			0.027	
	No income			0.103*	
Reason for production (base: not farming)	Main source of food			0.030*	
	Main source of income			-0.029***	
	Extra income			-0.01	
	Extra food			0.017	
	Leisure			-0.016	
Reason for production interacted with homeland	Main source of food		-0.037*		
	Main source of income		0.048		
	Extra income		0.016		
	Extra food		-0.02		
	Leisure		-0.005		
Constant	0.031***	0.020***	0.018***	0.029***	
R-squared	0.000	0.014	0.017	0.001	
N	19 952	19 290	19 290	19 216	
F statistic	3.858	53.384		29.592	

Source: Own calculations from GHS (2010)

Note: * p<0.1, ** p<0.05, *** p<0.01. Hunger is defined as a binary variable indicating whether adults in the household had 'often' or 'always' experienced hunger in the preceding 12 months. Homelands are identified by linking enumerator areas to homeland boundaries in ArcGIS. Regressions are weighted to reflect population totals and standard errors are clustered at the PSU level.

3 percentage points more likely to experience adult hunger than are non-farming households. This association probably represents a pull factor (households that are hungry tend to farm for food) rather than a causal relationship in which choosing to farm for income leads to hunger. However, the large negative interaction in this category (that is, larger than the positive main effect in absolute value) with homeland status suggests that in these regions production for a main source of food does indeed reduce hunger successfully. As a result, subsistence farming does tend to offer food security in homeland regions. Households that set out to produce food for a main *income* source generally experience about a 3 percentage point lower hunger rate (with no significant differences for homeland regions), echoing the results from specifications 2 and 3. This suggests that market-oriented agriculture also improves household food security, although subsistence agriculture does so only in homeland regions. Hence, the subsequent analysis limits itself to African households that live within former homelands and that indicate they have access to land which they could cultivate.

Table 4.7 presents an exploration of hunger patterns for African adults *within* former homeland regions who had access to farming land. Specification 5 suggests that hunger is significantly lower (compared to households that did not farm with crops) only in households that rented their land or conducted sharecropping. However, the number of households in these groups is very small, so not much weight should be attached to these results. It is somewhat surprising, however, that farmers who owned their land or had access to tribal lands were not statistically significantly better or worse off than households that did not cultivate crops. Specification 6 sheds light on this observation. Controlling for a set of land size indicators, it is evident that both of these groups experienced significantly higher levels of hunger. Additionally, those that farmed on progressively larger lands experienced lower hunger rates than households that did not cultivate crops. Thus, hunger reduction is subject to economies of scale in crop production. Does ownership and farming on tribal lands, therefore, disadvantage producers in reducing household hunger? Two explanations are possible: firstly, given that we have controlled for the size of the land, the coefficients may display the effect for the smallest farmers, suggesting that landowners are not successful at curtailing household hunger; secondly, the null effect found for tribal lands in specification 5 may simply be masking the effect that tribal lands and sharecropped lands are generally larger than other land types (so that a food security disadvantage on tribal lands is cancelled out by a large farm advantage, both of which we see in specification 6). Controlling for a range of other factors in specification 7 renders tenure status insignificant in determining hunger.

In the first instance, it is evident that rather than cultivating crops on a farm, food gardens in schools, homes and communities are highly successful in reducing hunger. These

Table 4.7: Linear probability models of adult hunger by household (2)

Dependent variable: Adult hunger dummy		5	6	7
Property rights (base: households that did not plant crops)	Own	-0.008	0.028***	-0.012
	Rent	-0.036***	0.004	-0.03
	Sharecropping	-0.036***	-0.014	-0.052*
	Tribal	0.014	0.042***	-0.009
	State	0.116	0.156	0.105
	Other	-0.036***		-0.035
Land size (base: households that did not plant crops)	0.0–0.5 ha		-0.038***	0.056***
	0.5–1.0 ha		-0.018	0.073**
	1.0–2.0 ha		0.046	0.129*
	2.0–5.0 ha		-0.084***	0.019
	5.0–10.0 ha	-0.066***	0.082*	
	10.0–20.0 ha	0.554*	0.623*	
	>20.0 ha	-0.073***		
Location of land (base: households that did not plant crops)	Farm		-0.002	
	Backyard garden		-0.056**	
	School garden		-0.075***	
	Communal garden		-0.119***	
	Fallow public land		-0.124*	
	Other		-0.066*	
log (household income type)	Education			-0.004***
	Age			-0.001*
	Salary			-0.002*
	Remittance			-0.004***
	Child support grant		0.000	
	Old age pension		-0.005***	
	Disability grant		-0.001	
	Care dependency grant		0.003	
	Foster grant		0.003	
	Grant in aid		0.001	
War veterans grant		-0.014**		
Government assistance received by household	Training		0.024	
	Visit		-0.018	
	Grant		0.163	
	Loan		-0.124***	
	Inputs on loan		0.063	
	Inputs for free		0.067**	
	Dipping of livestock		-0.016	
	Other		-0.048	

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Table 4.7: Linear probability models of adult hunger by household (2)

Dependent variable: Adult hunger dummy	5	6	7
Female household head			0.01
Water polluted		0.027**	
Land degraded		0.009	
Land grant			-0.02
Constant	0.036***	0.036***	0.103***
R-squared	0.003	0.012	0.054
N	4 693	4 676	4 562
F statistic		7.016	2.97

Source: Own calculations from GHS (2010)

Note: * p<0.1, ** p<0.05, *** p<0.01. Hunger is defined as a binary variable indicating whether adults in the household had 'often' or 'always' experienced hunger in the preceding 12 months. Homelands are identified by linking enumerator areas to homeland boundaries in ArcGIS. Regressions are weighted to reflect population totals and standard errors are clustered at the PSU level.

operations are usually smaller, but can draw on shared knowledge and shared risks, which reduce household exposure to hunger. Furthermore, the level of education of the household head reduces hunger rates significantly, though by a small magnitude. These two impacts suggest that knowledge, whether learnt at school or acquired in the community, and risk sharing are important in improving food security.

The analysis also shows that exposure to hunger is lower in households with older heads. This pattern is also evident in the rest of the specification: household incomes from grants that are targeted at older individuals (the old age pension and the war veterans' grant) significantly reduce hunger, while other types of grant are less likely to do so. Furthermore, the size of these effects is larger than those for total salary and remittance income. Evidently, then, within farming communities in former homelands, grants have become a vital channel to combat socio-economic differentials, as discussed above. However, the greater role of grants targeted at older individuals provides a more nuanced picture in this regard. Klasen and Woolard (2009) show that households which receive old age pensions, in particular, provide a safety net for the rural unemployed, given that the value of this grant is substantially higher than many other grants. While this household formation pattern also hedges against hunger (as noted in these results), Klasen and Woolard (2009) point out that this behaviour isolates individuals from labour market incomes. Grants, therefore, represent a double-edged sword: on the one hand, they reduce socio-economic distress; on the other hand, they perpetuate a reliance on resources outside of the labour market.

Table 4.8 turns the attention to explaining convergence in hunger between homeland and non-homeland regions over time, as depicted in Figure 4.1. To achieve this, we pool the data from the 2002, 2003, 2004, 2008 and 2010 GHSs⁷ and build linear probability models similar to those for 2010, but this time relying on variables for which common definitions

could be found across all years. Interaction effects between time periods and homeland status are included to monitor convergence patterns in food security across regions over time.

Specification 1 in Table 4.8 repeats the analysis in Figure 4.1 in parametric form, highlighting that in 2002 hunger rates were about 2.7 percentage points higher in former homeland regions than in non-homeland areas. By 2004, hunger rates in non-homeland regions had declined by 1.7 percentage points from the 2002 level, and by just more than 4.0 percentage points in 2008 and 2010 (both statistically significant). Notably, the interaction effects are large, negative and statistically significant, indicating that the rates of decline in hunger were faster in homeland regions. In particular, by 2008 the decline of 2.9 percentage points relative to 2002 eliminates the initial 2.7 percentage point homeland hunger premium. Hence, by 2008 at the latest, hunger differences between homeland and non-homeland regions were eliminated. However, the financial crisis followed, and by 2010 this improvement reversed slightly, so that the interaction effect is smaller than the 2.7 percentage points, and a slight gap in hunger rates re-emerges between homeland and non-homeland regions. From this we can conclude that hunger in the former homelands tends to be more responsive to upswings and downswings in the economy than elsewhere.

The following columns progressively control for other variables in an attempt to render the homeland coefficient and its interaction with time statistically insignificant. If this is the case, we know that that particular factor 'explains' the initial difference and the convergence over time.

Specification 2 investigates whether the differential change in main income sources across region (as highlighted in Figure 4.2) can explain the differences in hunger patterns. In Table 4.1, it is evident that this control eliminated the homelands difference in 2010. While controlling for income sources accounts for large variations in hunger, the expansion of grants in the homeland regions does not account entirely for time changes and convergence patterns in hunger. The decline in hunger for both former homeland and non-homeland households remains steep and statistically significant, despite conditioning on income source. Grants, therefore, do not explain the entire declining hunger trend. However, about half of the initial differences in hunger across regions can be explained by the greater access to salary incomes that non-homeland households enjoy.

Specification 3 looks at household property rights in an attempt to explain the patterns. In this case, the homeland and time coefficients hardly change relative to specification 1. The greater increase in land ownership in homeland regions is also dismissed as an explanation for the faster rate of decline in hunger amongst former homeland households.

Specification 4 attempts to understand whether scale economies assisted in reducing hunger among farmers. In other words, did only commercial, large-scale farming result in reductions in hunger? All coefficients reveal statistically

Table 4.8: Linear probability models of adult hunger by household (3)

Dependent variable: Adult hunger		1	2	3	4	5	6
Year (base: 2002)	2003	-0.004	-0.007*	-0.004	-0.004	-0.007	-0.006
	2004	-0.017***	-0.018***	-0.017***	-0.016***	-0.018***	
	2008	-0.043***	-0.040***	-0.043***	-0.043***	-0.044***	
	2010	-0.042***	-0.036***	-0.042***	-0.042***	-0.038***	-0.029***
Interactions with homeland	Homeland	0.027***	0.010*	0.023***	0.024***	0.011*	0.008
	2003	-0.014**	-0.011	-0.013*	-0.013*	-0.011	-0.012*
	2004	-0.003	-0.001	-0.001	-0.002	-0.001	
	2008	-0.029***	-0.026***	-0.026***	-0.028***	-0.029***	
Main household income source (base: salary income)	Remittances		0.068***			0.067***	0.072***
	Pensions/Grants		0.048***			0.054***	0.042***
	Sales of farm products		0.038***			0.036***	0.033
	Other non-farm		0.047***			0.046***	0.049***
Property rights (base: households that did not plant crops)	No income		0.167***			0.169***	0.194***
	Own			0.003		-0.025	-0.029
	Rent			0.007		-0.002	-0.013
	Sharecropping			0.017		-0.001	-0.006
Land size (base: households that did not plant crops)	Tribal			0.015***		-0.015	-0.016
	0.0–0.5 ha				0.010***	0.017	0.012
	0.5–1.0 ha				0.005	0.01	0.003
	1.0–2.0 ha				0.089	0.088	0.075
	2.0–5.0 ha				0.002	0.006	0.009
	5.0–10.0 ha				-0.038***	-0.026	-0.035
	10.0–20.0 ha				0.070*	0.090*	0.164**
>20.0 ha				0.048	0.063	0.056	
log (household income type)	Number of children in household					0.002***	0.003***
	Number of elderly in household					-0.011***	-0.007***
	Education of head						-0.006***
	Age of head						0.000***
	Age of head squared						-0.000***
log (household income type)	Child grant						-0.001
	Old age pension						-0.005***
	Disability grant						0.002***
	Care dependency grant						0
	Foster care grant						0.001
	Grant in aid						0.007*
	War veterans grant						-0.008***
log (household income type)	Land grant dummy						0.018*
	Constant	0.073***	0.051***	0.073***	0.072***	0.048***	0.081***
	R-squared	0.011	0.032	0.011	0.011	0.035	0.051
	N	95 485	94 694	95 090	95 012	94 104	55 395
	F statistic	42.604	63.13	29.93	24.53	35.877	31.898

Source: Own calculations from GHS (2002, 2003, 2004, 2008, 2009, 2010)

Note: * p<0.1, ** p<0.05, *** p<0.01. Standard errors are clustered at the enumerator area level and household weights applied.

insignificant differences compared to non-farming households, while the coefficients of interest are unaffected.

Specification 5 keeps all the preceding factors in the model, as well as conditions on changing household composition. These factors also do not 'explain' the faster decline in hunger in former homeland regions. While households with more children also faced higher levels of hunger, those with more pension-age adults experienced lower levels of hunger. Children, therefore, raise the dependency burden, while the elderly lighten the burden (more than likely through the additional pension income they bring to the household, as argued above). Evidently, it is still not possible to fully account for *initial* homeland and time differences. The results are similar to those encountered before.

Specification 6 is the first to eliminate initial differences in hunger between homeland and non-homeland regions. As before, the controls for income from various grants reveal the importance of pension income in reducing hunger. Controlling for whether households received a land grant (in other words, whether they were the subjects of land reform), contributes to 'eliminating' the initial homelands hunger premium (though not the time patterns in hunger reduction). Households that received these grants faced significantly higher levels of hunger. However, we cannot say that land reform *caused* hunger. It is merely the case that households that were initially subject to higher levels of hunger were also recipients of land reform, and the programme did not completely eliminate these initial disparities. Alternative identification strategies would remove this selection bias. What is important is that controlling for this factor 'explains' higher hunger rates in former homeland regions, by rendering the homeland coefficient statistically insignificant. Again, this does not suggest that hunger differences were eliminated by land reform, but it does suggest that land reforms successfully reached households that had greater levels of hunger. Nevertheless, Keswell and Carter (2012) present evidence on the impact of South Africa's land reform programme, showing that after three years, the treatment effect is a 50 per cent increase in household consumption.

Conclusions and policy discussion

While it is easy to paint a dire picture of socio-economic circumstances in former homeland regions, this article shows that hunger levels in these regions converged with those in other parts of South Africa. The descriptive and historical analysis shows how former homeland regions were set up for small-scale intensive farming that had little scope for success. Nevertheless, by 2008 hunger had decreased substantially in these regions. Social grants undoubtedly had a large role to play in this regard; they expanded rapidly over the period 2002–2010 in all regions, but dependence on them grew faster in former homeland areas. Access to these grants (or a lack of salary income) explains a large part of hunger differences across the region types. In particular, receiving social pensions reduced hunger substantially. However, it is also illustrated here that economies of scale and tenure systems are important for food security. Nevertheless, very small-scale (garden) farmers also successfully reduce adult hunger levels. These results, therefore, support the notion that the food security legacy of the 1913 Land Act and other apartheid legislation can be tackled by improving the capacity of small-scale farmers. While controlling for land reform programmes eliminates differences in hunger across regions, the estimates here cannot state causally that land reform has enhanced food security in these regions.

The more convincing evidence is that interventions that equip communities to farm together can reduce hunger, emphasising the role of risk and knowledge sharing. While social grants mitigate the effect of hunger on households, this is not a fiscally sustainable way forward in comparison to the benefits of promoting small-scale agriculture in communities. As noted by Klasen and Woolard (2009), sizable social pensions result in household formation patterns that isolate individuals from the mainstream of the labour market. While one of the legacies of the 1913 Land Act (hunger in the homelands) has been plastered over with social grants, the longer-term solution appears to be a focus on the effectiveness of small-scale farmers and their links to the market economy. If this is achieved, the impact (greater food security) is likely to provide more sustainable relief to these regions.

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Endnotes

- 1 In the 2002–2004 data, we identify homelands by former magisterial districts, which are coded in the GHS. While the correspondence of the boundaries is not perfect, some households that lived in a former magisterial district that partially contained a homeland would be classed as such; hence, some households that lived in areas adjacent to that homeland would also be classified as a homeland area. This is more conservative, as the homeland effects measured will be under- rather than over-stated, as some (wealthier) non-homeland regions are included in some of the homeland classifications. In the 2008–2010 data, we identify homeland areas by enumerator area, so that this definition is more precise.
- 2 These include the National Food Consumption Survey (NFCS); General Household Survey (GHS); Income and Expenditure Survey (IES); Food Insecurity and Vulnerability Information and Mapping System (FIVIMS); Labour Force Survey (LFS) and the Community Survey (CS) (Du Toit 2011). Government policy in South Africa is informed largely by the Statistics South Africa surveys, which are the GHS, IES, LFS and CS.
- 3 These are estimated by Ordinary Least Squares rather than by a probit or a logit model, as it eases interpretation. Average marginal effects do not differ substantially, and we do not wish to predict propensity scores; thus, we continue with this method to aid the discussion.
- 4 Hunger is defined as ‘always’ or ‘often’ going hungry due to a lack of sufficient food in the preceding 12 months. Results presented here consider this question for adults, though they are similar when analysing child hunger, and are also robust to classifying ‘sometimes’ as hungry.
- 5 Similar results hold true for child hunger, and are available on request.
- 6 As shown below, by 2008 hunger differences are negligible, but re-emerge after the financial crisis.
- 7 The intermediate years are excluded, as it is not possible to identify magisterial districts or census enumerator areas in order to define a household as living within a former homeland.

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