City Research Online

City, University of London Institutional Repository

Citation: Pereira, L., Cuneo, C. N. & Twine, W. C. (2014). Food and cash: understanding the role of the retail sector in rural food security in South Africa. Food Security, 6(3), pp. 339-357. doi: 10.1007/s12571-014-0349-1

This is the accepted version of the paper.

This version of the publication may differ from the final published version.

Permanent repository link: https://openaccess.city.ac.uk/id/eprint/19465/

Link to published version: https://doi.org/10.1007/s12571-014-0349-1

Copyright: City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

Reuse: Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

City Research Online: http://openaccess.city.ac.uk/ publications@city.ac.uk

Food and Cash: Understanding the role of the retail sector in rural food security in South Africa

Laura M Pereira,[1] **C Nicholas Cuneo**[2,] **Wayne C Twine**[3]

1 School of Geography and the Environment, University of Oxford,

School of Environmental and Geographical Sciences, University of Cape Town, Private Bag X5 Rondebosch, 7701, Cape Town, South Africa.

E-mail: laura.pereira@st-hildas.oxon.org. Telephone: +27828174748.

2 Harvard School of Medicine, U.S.A. E-mail: nick.cuneo@fulbright.org

3 School of Animal, Plant and Environmental Sciences, University of the Witwatersrand, South Africa. E-mail: rcrd@global.co.za

1. INTRODUCTION

Sub-Saharan Africa (SSA) has the highest regional proportion of undernourished people in the world, making food security a major development concern on the continent (FAO 2010) Although South Africa appears fundamentally food secure at the national level, this changes when the scale of analysis is reduced to the local level, at which many food insecure households emerge (Altman et al. 2009). As such, food security policy is often directed locally with focus on governmental interventions like food aid packages during crisis events (Pereira and Ruysenaar 2012). We argue here that to be effective within the bounds of the greater food system, food policy must be multi-level and take into account a diversity of actors, including the growing retail sector. Echoing Ashley and Maxwell's (2001) call for a post-Washington Consensus on FARD (Food, Agriculture and Rural Development), we embed this theoretical re-understanding of the rural food system within empirical analysis, recognizing that food security policy cannot be isolated from other development and livelihood concerns like social protection, sources of income, access (to land, water, inputs, etc.), retail markets, and education. As long as we have a limited understanding of how these multiple factors influence access to food, our ability to design appropriate food security policy solutions remains severely constrained (Altman et al. 2009).

We identified a knowledge gap concerning the role that the private sector in the form of retailers plays in rural food security strategies in South Africa. This lack of understanding has led to these actors being underappreciated as potential adaptive agents to future pressures and change. At the same time, the heterogeneity of rural circumstances (as appreciated by Ashley and Maxwell 2001) is important to recognize, not just spatially in terms of landscape, but also in regard to how we identify 'the rural poor' and understand their relationship with the land, which is not as straightforward as some in policy would make it out to be. In this respect, we set out to address these concerns for food security policy by assessing the relative importance of buying food versus growing crops across socio-economic strata in our study site, what food security strategies people have devised that involve the retail sector, and how policy can be focused so as to enhance the adaptive capacity of these processes under the future threat of 'double exposure' to global environmental change (GEC) and globalization (O'Brien and Leichenko 2000).

This paper contains a two-part analysis. First, we use a sustainable rural livelihoods (SRL) framework to examine the quantitative and qualitative data in our case study community in order to describe the current food system, with particular emphasis on the role of the retail sector in livelihoods. Second, we present options for developing adaptive livelihood strategies based on these findings with the aim of promoting community-level food security into the future. We argue that while the retail sector is currently playing a major role in local food security strategies, the focus of policy remains fixed largely on agricultural production. The result is that other concerns within the food system, such as developing local markets and meeting people's need for nutritious food, are not being adequately addressed.[4] Furthermore, addressing poverty-related issues of food security cannot focus exclusively on the lack of a household's assets, but on constraints they face in effectively making use of these assets as well (Carter and May 1999). Finally, there is a need to address the broader

[4] This is chiefly a product of the national government's food security department being run as a sub-division of the Department of Agriculture

question of differentiating between what defines a coping strategy that deals with a particular stress over the short-term versus an adaptive strategy that builds household and community-wide resilience in the face of long-term changes. How the government can facilitate long-term adaptation rather than short-term coping is critical for rural development policy under the South African government's New Growth Path (NGP) (Republic of South Africa 2010).[5]

The structure of the paper is as follows: we begin with an introduction to food security in South Africa within the context of the double exposure, followed by an overview of our methods. We then present our results from the case study, which show the significance of the retail sector in food security strategies, especially for low-income groups least reliant on the land and agriculture for their livelihoods. Following this, we explore two innovative food security strategies: the expansion of small, local food stores in the area and the establishment of grocery collectives. In our discussion, we propose recommendations for increasing the community's adaptive capacity by recognizing the importance of the retail sector and incorporating this knowledge into policy options.

1.1 *Food security under double exposure*

The Food and Agriculture Organization (FAO 2010) states that "food security exists when all people at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life." Scholars have interpreted this definition into the elements of stability of food availability, access, and utilization (Schmidhuber and Tubiello 2007). Most studies focus on just one element of food security (usually production), but in order to conduct a holistic analysis it is necessary discuss all three elements in the context of double exposure to the macro-trends of globalization and global environmental change (GEC) (See Figure 1). People respond in a variety of ways in order to cope with these changes, often with the result that these responses create feedbacks amplifying changes in food security outcomes. We assess the retail sector as a mediating actor that can build resilience in the system, allowing for different, more adaptive, response mechanisms.

(Figure 1 here)

Figure 1: Conceptual model of the food system used in this study

We have limited the concept of globalization to focus on the current trends of deagrarianization[6] and the expansion of the retail sector in rural areas and we narrow GEC to the potential future impacts of climate change. We argue that these simultaneous pressures are transforming rural food systems in a manner so far

[5] The New Growth Path ambitiously refers to "restructuring land reform processes to support smallholder schemes with comprehensive support around infrastructure, marketing, finance, extension services etc.; upgrading employment in commercial agriculture especially through improved worker voice; measures to support growth in commercial farming and to help address price fluctuations in maize and wheat while supporting national food security; acceleration of land claims processes and better support to new farmers following land-claims settlements, programmes to ensure competitive pricing of inputs, especially fertilizer; and support for fishing and aquaculture."

[6] Where deagrarianization is described as the long-term process of occupational adjustments, income reorientation and spatial relocation of rural people away from livelihoods structured around agriculture (Bryceson 2002: 726).

unanticipated in food policy. African communities are particularly vulnerable to climate change due to their dependence on agriculture as well as their exposure to extreme events (Vogel 2005). In the South African landscape, these processes are exacerbated due to the dual nature of the agricultural sector, with a stark contrast in access to resources, including land, between smallholder and commercial farmers (van Zyl and Kirsten 1992; Pereira 2012). Simultaneously, SSA faces a change in rural livelihood strategies as part of an ongoing process of deagrarianization. Bryceson (2002) argues that structural adjustment programs (SAPs) and their aftermath had a profound impact on rural livelihoods and income diversification away from agriculture. This decline in agricultural productivity can be linked to the change in policy brought in by SAPs that saw: 1) the removal of subsidies for agricultural inputs (especially fertilizer), pricing them out of the range of many, and 2) market uncertainty, previously mitigated either by set prices or marketing boards that guaranteed demand. This uncertainty has been linked to the reluctance of private traders to travel to distant areas where there is little to no transport infrastructure or cold storage facilities to keep produce fresh, as well as hesitation on the part of the farmers themselves to spend money traveling to markets if there is no price guarantee (Bryceson 2002). As a result, many former agricultural communities have been compelled to diversify out of agriculture in order to meet their livelihood requirements. This economic radiation has had social implications for divisions of labor among household members (as woman were often "part of an agrarian family work effort"), and in livelihood decision-making processes that have repercussions on households' vulnerability to economic and environmental stresses (Bryceson 2002: 733). South Africa's evolving HIV/AIDS epidemic has, furthermore, had a major impact on household vulnerability, depriving families of contributions from their most productive members while increasing overall costs to the family, particularly in the case of mortality (Anabwani and Navario 2005; L. Hunter et al. 2007). A number of links between HIV/AIDS and food security have been established in the literature, including their interaction with the immune system as well as the diet-dependent side effect profiles and efficacies of certain antiretroviral drugs, emphasizing the importance of the epidemic to understanding the local food security context (Anabwani and Navario 2005; Weiser et al. 2011). As this study will show, these combined processes have resulted in households' becoming increasingly reliant on income (including social grants) in a cash-based rural economy.

Globalization and the expansion of retail-sector food businesses has led to a major shift in dietary patterns, especially within middle-income countries, resulting in a "nutrition transition" with a rise in relative consumption of fats and sweeteners worldwide (Hawkes 2006). This transition has been implicated in a variety of public health issues, including levels of obesity, heart disease, and diabetes, which are increasing globally (WHO 2012). In South Africa, as with other economies in transition, obesity has become a major food policy challenge and is associated with a shift from a traditional diet (low in fat and rich in fiber) towards one high in saturated fats and refined sugars (Kruger et al. 2005). Hawkes (2006) identified three major processes of globalization responsible for precipitating this transition, which also serve to highlight the interconnections among the different levels of food security: 1) liberalizing of international markets for trading and producing agricultural products (which has led to rapid increases in the availability of certain products, such as oil crops); 2) diminishing foreign direct investment (FDI) barriers in companies that process and sell foods in developing countries (which has contributed to a shift in

developing countries from smaller grocery outlets to larger, chain supermarkets selling a growing array of processed foods); and 3) increasing investment in and visibility of food advertising and promotion (which is aimed at changing the food culture in the countries where such advertising is permitted). Altogether, these processes have contributed to a "convergence of diets" in which people across the world have begun narrowing their focus on a limited number of staple grains, consuming more meat and dairy products, and increasing their intake of edible oils, salt, and sugar (Hawkes 2006; Kennedy et al. 2004).

This study is an empirical investigation of food security strategies across socioeconomic strata in a rural region of South Africa. We emphasize the role of the retail sector in achieving food security outcomes, especially with respect to access and utilization. By focusing on how food security strategies fit into the greater scope of livelihood strategies (not just agricultural production), we identify key areas of focus for creating more resilient local food systems capable of withstanding future pressures from globalization and environmental change. These areas include: 1) creating employment opportunities to generate income; 2) improving smallholder agricultural productivity; and 3) leveraging the social grant scheme for improving access for the poorest (Altman et al. 2009).

1.2 *South African food security in context*

South Africa's history is characterized by the systematic displacement of the indigenous black population, resulting in a process of 'black pauperization', whereby blacks were stripped of land and other productive assets (Aliber 2003; Zimmerman 2000).[7] Under the apartheid system, areas demarcated as black reserves, or 'homelands,' constituted only 13% of South Africa's land area, and typically consisted of fragmented and isolated pockets of land with poor infrastructure (Aliber 2003). The 1950s to the 1980s saw a massive relocation of the black rural population to these homelands as 'surplus' black residents on white-owned farms (i.e., those on whom the farm's productivity was not dependent) were forcibly removed and resettled (Seekings 2000). As a result, population densities in the homelands soared, doubling between 1955 and 1969 (Simpkins 1981). In 1999, regions comprising the former homelands were home to 2.4 million rural households and a population of 12.7 million people (32% of the total population) (Adams et al. 1999).

Lack of employment opportunities within the homelands, aggravated by severe shortages of arable and grazing land, led to widespread rural poverty (Aliber 2003; Francis 2002). This forced rural residents, especially men, to become migrant laborers in order to support their families. In fact, the main economic function of the homelands was to reduce and subsidize the cost of labor (Wolpe 1972). The high population densities and drastic shortages of land transformed the economic and social organization of these communities (Delius 1996), precipitating the transition from an *agrarian* to a *cash-based* rural economy (Gelderblom and Kok 1994). Seekings (2000) argues that an independent peasantry had been virtually eliminated by the end of the first decade of the apartheid regime effectively "nipp[ing] peasant commodity production in the bud" and making the rural population a functional labor reserve (Bryceson 2002: 727). In a study by Marcus et al. (1996) in which attitudes of

[7] The progressive dispossession of black populations of their land started with colonial expansion (from the mid-1600s to the mid-1800s) and reached its zenith during the apartheid era (1948-1994).

rural households about land were surveyed, approximately 33% of respondents indicated no interest in acquiring more land, while a similar proportion wanted one hectare or less for subsistence cropping. The youth were particularly uninterested in farming, creating a demographic skew towards an elderly rural population being supported by a young, urban population where transfer payments became the mainstay for rural households (Bryceson 2002).

Agriculture has since been shown to contribute, on average, very little to income among poor rural South African households, even in those households that maximize what they can from the land (Carter and May 1999). Rather, there has been a trend towards more subsistence-based agriculture on small residential garden plots (rather than fields) and crop cultivation oriented towards domestic production and gift-giving rather than commercial sale (Bryceson 2002). Carter and May (1999) attribute this trend in part to a lack of household assets, especially agricultural and other productive equipment that could be used in micro-enterprise. This paucity of liquid assets underscores the lack of safety nets among poor households, leaving them vulnerable to income loss or failure of entitlements (Carter and May 1999). Insecure land tenure—predominantly communal tenure on state land under weak traditional governance— exacerbates the situation. Access to communal land for agriculture is controlled by the traditional authorities (chiefs and their headmen), who formed part of the apartheid bureaucracy under the homeland system (Fay 2009). Tenure reform in the former homelands poses a threat to the powers and privileges enjoyed by the traditional authorities, and has thus been met with resistance by chiefs and powerful groups representing their interests (Lahiff 2005).

Post-apartheid social grants, particularly old-age pensions, have brought much-needed capital to rural areas, stimulating the now cash-based economy while simultaneously making the elderly a primary contributor to boosting rural purchasing power (Bryceson 2002). This need for access to cash in order to buy food is important in South Africa because the ability to access social grants is mediated by socio-economic status and nationality. Evidence in our study area suggests that application for child support grants is highest among households of medium to medium-high levels of wealth, not the very poor (Twine et al. 2007). Various reasons have been identified (e.g. a complicated means test, and the distance to nearest social security station), with the combined outcome that benefits associated with social assistance do not necessarily reach the most vulnerable (Twine et al. 2007). This discrepancy reinforces existing disparities and has major consequences for families' purchasing power and food security.

2. METHODS

2.1 *Study site and community*

This study was conducted in the Agincourt Health and Demographic Surveillance System (AHDSS) site located roughly 500 km northeast of Johannesburg in the local municipality of Bushbuckridge, Mpumalanga Province. Completing its first annual census in 1992, the AHDSS was initiated in 1991 as a collaboration between the University of the Witwatersrand Department of Community Health and the former Gazankulu homeland and Tintswalo Health Services (Tollman 1999). The AHDSS

was set up with a mandate to inform primary healthcare-centered reform by helping to gather data about health outcomes, conditions, and services in densely populated rural areas of South Africa and by serving as a closely monitored pilot site for innovative health programs (Tollman 1999). It now includes a population of around 90,000 individuals residing in roughly 6,000 households across 27 participating villages (Kahn et al. 2012). The research catchment area comprises a population and region that are significantly resource-limited. While some progress has been made in developing the area in recent years (such as electrification), major infrastructural challenges remain, including the provision of running water and modern sewage systems to the vast majority of households. Communities are governed by a combination of traditional and civic leadership, which work either collaboratively or, in some cases, antagonistically with each other. At the government level, with regards to agriculture and food security, the Mpumalanga Department of Agriculture, Rural Development and Land Administration offers farmer support and development services at the district level.[8]

The Tsonga/Shangaan people are the majority ethnic group within the AHDSS. While most residents of the site are South African, there is also a sizable immigrant population: almost a third of households in the study site are of Mozambican origin (Kahn et al. 2007). While some of these families have attained South African citizenship, many remain undocumented, with significant consequences for their ability to take advantage of South African social services or gain formal employment within the country.

With a population density of 174 persons/km^2, the study site is too heavily settled to allow most families enough space within their homestead plots or even outside the villages to plant crops on more than a very small scale (Madhavan and Townsend 2007). This situation stems from the aforementioned apartheid-era land policies as well as the influx of immigrants to the region since the 1980s (Giannecchini et al. 2007) and emphasizes land as a constraining factor to food production in the area. Moreover, the site is located in a semi-arid region of the country with inconsistent rainfall and predominantly infertile granitic soil, adding an additional layer of vulnerability and challenges to households that could otherwise depend more heavily on growing their own crops to supplement their diets. Domestic water supply is in the form of community taps supplied by boreholes or local streams and dams. Almost all agriculture is rain-fed. Together, these factors have resulted in very few, if any, households being able to maintain a truly subsistence lifestyle.

While income sources are varied, the area's low levels of education and very limited employment opportunities have resulted in considerable labor migration, making

[8] This includes providing technical and infrastructure support to land reform beneficiaries including subsistence food producers, smallholder farmers and commercial farmers. The programme also seeks to promote job creation, income generation and household food security through the implementation of commodity based projects funded through the Comprehensive Agricultural Support Programme (CASP) the Masibuyele Emasimini and Masibuyele Esibayeni Programme. See their website at: http://dardla.mpg.gov.za/prog3.html.

many households reliant on remittances from migrant laborers (Kahn et al. 2007).[9] Many families supplement the food they grow and purchase by harvesting natural resources (Table 4) in communal rangelands (Shackleton and Shackleton 2004). However, utilization of these natural products as well as the sustainability of the methods of harvesting them is heavily dependent on the socioeconomic context in which such acts are carried out.

2.2 *Data collection*

This study required an ontological approach recognizing the complexity of the food system under double exposure while allowing an empirical focus on food security outcomes at the household level. The importance of livelihood strategies in adapting to climate change has been highlighted in the literature (Adger et al. 2003; Thomas et al. 2005; Ziervogel et al. 2006a). The SRL approach, which looks at how, within a given context, differential access to capital (natural, economic, human and social) defines how households pursue different livelihood strategies, has successfully been employed in similar food system-related studies (Devereux and Maxwell 2001; Misselhorn 2009; Scoones 2005; Ziervogel et al. 2006b). This approach aims to emphasize the many elements that shape a household's livelihood in the community, the factors driving these livelihood choices, and how they are interlinked (Babulo et al., 2008).[10] Building resilience is key for livelihood adaptation: those unable to cope with or adapt to stresses become vulnerable to them, unable to achieve "sustainable livelihoods" (Scoones 2005: 6). There are various outcomes of successful livelihood strategies, including increased income, improved well-being, decreased vulnerability and maintenance of food security (Babulo et al. 2008).

All research materials and methods were reviewed and approved prior to the commencement of the study by the Wits Human Research Ethics Committee (Clearance certificate: M090825). We employed a mixed methods approach to assess food security and coping strategies at the household level. Qualitative methods included holding focus sessions with key informants and conducting in-depth interviews with a representative portion of study households, along with local storeowners. Quantitative methods included surveying study households using a questionnaire, collecting a snapshot of food prices in the area, and analyzing previously collected data from participating households, which were extracted from the AHDSS database. The AHDSS data were gathered from a food security survey conducted in 2004 and in 2007. Details of the design and methodology for the questionnaires have been published previously (L. Hunter et al. 2007). Only the data from the households selected for this study were extracted from the database for analysis. Study households were selected using an algorithm to minimize research fatigue among catchment households and to ensure relatively equal distribution of households across socioeconomic strata and study sites.

---

[9] The HIV epidemic in the region has caused many families to lose their primary breadwinners, leading them to be even more vulnerable to food insecurity due to the loss of income associated with that household member (Hunter et al., 2007). A 2011 survey revealed an antenatal prevalence rate of 36.7% in Mpumalanga, the second highest in the country (Republic of South Africa 2012).

[10] A sustainable livelihood "can cope with and recover from stress and shocks, maintain or enhance its capabilities or assets and provide sustainable livelihood opportunities for the next generation and contribute net benefits to other livelihoods at the local and global levels and in the short and long term" (Chambers and Conway 1991).

Three small focus sessions (4-8 individuals) were initially held with household food providers from a diversity of socioeconomic backgrounds across the AHDSS communities from which we drew our sample. Sessions with food providers focused largely on the availability, accessibility, and consumption of food in the communities, as well as popular coping strategies used by families in response to household shocks. In addition to these sessions, we also met with local leaders from the communities, particularly those who were involved in organizations that had a direct impact on food security (e.g., farmers' groups, grocery societies) in order to better understand the function and capabilities of community groups in the areas in which we were working. All focus sessions were carried out in September 2009, facilitated by a trained XiTsonga-speaking qualitative worker under the direction of the site manager.

A sample of 117 households, stratified into thirds by socioeconomic status (SES), was selected from three villages in the AHDSS site. SES score was calculated based on household ownership of assets and access to amenities (see Collinson 2010 for explanation of the calculation). These data are collected for all households every two years in the AHDSS (see Khan et al. 2012 for further information regarding the households and demographics of the study site). Household SES scores were stratified into terciles from which a random sample of households was drawn. Of the 117 sample households, 94 (80.3%) were available to participate in the study (the majority of those not participating were not present at the site over the sampling period). Of these, 33 came from households in the upper SES tercile, 30 from the middle, and 31 from the lower. Participation was entirely voluntary. After obtaining informed verbal consent, trained enumerators administered a 30-45 minute closed-form survey to the household's primary food provider (usually the head female family member) in XiTsonga (see Appendix 1). This survey tool covered a variety of topics, including demographics, social capital, harvesting of natural resources, food security, recent household shocks, and coping strategies. Food security was assessed numerically using two validated tools for measuring food access that have proved especially effective in resource-limited settings: the Household Dietary Diversity Score (HDDS: Swindale and Bilinsky 2005) and the Household Food Insecurity Access Scale (HFIAS: Coates et al. 2007). Household interviews were conducted in October 2009.

In order to gain a more in-depth perspective on the mechanisms being exploited by households to maintain food security both in times of economic or environmental hardship as well as throughout periods of relative normalcy, further loosely structured interviews were conducted with a portion of the sampled households. Fifteen (16.0%) households were selected based on their questionnaire responses, including their HDDS and HFIAS food security indices. Specifically, the two most food-secure and the two least food-secure households were chosen for each socioeconomic stratum (high, middle, and low), as well as a few households of special interest due to other factors (e.g., their involvement in certain groups or experience of a specific household shock). In-depth interviews were conducted in February 2010 with the primary food provider of the household (in most cases, the individual who had completed the prior questionnaire) in XiTsonga, using a professional translator trained in qualitative methods. Interviews were conducted, recorded, and transcribed by the second author of this paper.

The interviews with storeowners were conducted in July 2010. These were open-ended and conducted jointly between the primary researcher and a field assistant who

lives in the area and speaks fluent XiTsonga. Out of the 38 stores that were visited in and around the Agincourt AHDSS site, interviews were conducted at 15 stores that were chosen based on the type of store, its geographical location (in order to get a spread among the villages) and the willingness of the owners/managers to be interviewed. When encountered during the research, informal interviews were also held with the hawkers of fresh produce if they were willing to participate.

The stores were classified as follows:

1. **Spaza shops**: small businesses run by locals with a small range of products available.
2. **Cafés:** stores also run by locals, but better stocked than the Spaza shops.
3. **'Indian' stores**: cafés owned and run by people of South Asian heritage.
4. **General dealers**: larger shops with a diversity of stock usually located near main roads.
5. **'Indian' general dealers**: general dealers owned and run by South Asian immigrants.
6. **Retailers**: South African supermarket chains found in urban areas around the DSS site.

The data from the AHDSS questionnaire are non-parametric. Two types of analyses were done using Statistica©. For the questions with only a single binary answer, a contingency table with a chi-squared test for significance was done. For the questions where there was more than one set of possible yes/no answers, a Generalized Linear Model (GLZ) with a Wald test for significance was done.

3. RESULTS

The results section is divided into two sub-sections: the first deals with the quantitative data from the questionnaires and provides the context of food security in the area. The aim was to contextualize the three elements of food security within the food system in the area, emphasizing the elements of access and utilization, rather than to do an economic analysis of the food security of households. This allowed us to develop a holistic picture of the rural food system beyond an agricultural focus to incorporate other elements, in particular the retail sector. Our results show that food availability (what a typical food basket consists of rather than a function of agricultural production) and the nutritional quality of the food consumed by households are shown to be influenced by socio-economic status. Households' access to food is then discussed first through an analysis of how food is procured and second through different income strategies that provide the means for households to purchase and acquire food. Since the results show that a large amount of food consumed in the AHDSS site is bought rather than grown, the second sub-section shifts focus to an analysis of the qualitative data that deals with: a) the local entrepreneurs that provide the means through which food may be purchased in the area (i.e., the retail sector) and b) the role of grocery collectives as a local strategy employed by households to purchase food more affordably.

3.1 *Quantitative results*

(i) *Availability and utilization*

It is first necessary to understand what people eat before we can determine where it comes from as well as its nutritional value. A wide range of foodstuffs is consumed in the AHDSS site (Table 1A). Grains are the staple food and were consumed by almost all households. These were followed by sweets, other foods (e.g., condiments, coffee, tea), vegetables, and meat (excluding fish) as the most commonly eaten foods. Fish and tubers were the least commonly eaten food groups, consumed by less than half of all households interviewed within the time period. Dairy was the only food group for which prevalence of consumption differed significantly ($p= 0.05$) among SES classes, and was consumed more commonly by households with higher SES. This could have a variety of causes; because dairy requires refrigeration, for example, it can only be consumed by those with access to electricity and who can afford a refrigerator (or who keep milk cows). The widespread consumption of meat, typically thought of as a luxury food, is probably accounted for by the common practice of keeping chickens.

(Table 1A here)

Although it is interesting to note that the majority of households ate from a variety of food groups over the previous two weeks, the relative amounts are not noted nor is the frequency of consumption. Table 1B provides more information in the form of what food groups were consumed by the household in the previous 24 hours. Here we see a lower percentage of vegetables, fruits, and meat being consumed, which indicates that these may not be eaten on a daily basis and therefore not in sufficient quantities for a balanced diet. However, sweets and fats were consumed within the 24-hour period for most households, lending further support for the "nutrition transition" (Hawkes 2006). As before, the prevalence of consumption of dairy in the last 24 hours differed significantly by SES, being consumed more commonly within households of higher SES status.

(Table 1B here)

With respect to cultivated food, all households that cultivated crops planted maize to some degree. Within homestead gardens after maize, onions were the most widely grown crops followed by tomatoes and spinach (Table 2). At the bottom of the list are papaya (pawpaw), beans, cucumbers, and peanuts. Both peanuts and beans can be stored and are therefore readily available from most of the local stores, which may be one reason that they are less likely to be grown at home. Only 50% of households were cultivating crops at the time of the survey.

(Table 2 here)

Out of the 47 households cultivating crops, only 6 (12.7%) were cultivating outside of their homesteads: of these households, all were cultivating maize, three were cultivating cassava root and two were cultivating other vegetables. Whether or not a family grew crops (either on the homestead or off-site) had a significant effect on household food security, with those cultivating reporting higher dietary diversity over a 14-day period ($t=2.542$, $df=94$, $p=0.013$).

The number of households cultivating crops in homestead gardens varied significantly by socioeconomic status ($\chi^2(2, 94) = 7.57$, $p = 0.023$) with the largest proportion of

cultivators coming from higher income households (Table 3). This discrepancy likely has a significant impact on the type and quantity of fruit and vegetables that lower income households are able to procure (along with their associated micronutrients).

(Table 3 here)

Table 4 lists what types of wild foods are gathered and which are gathered most commonly. From the data, it appears that harvesting natural resources such as edible insects and fish from local dams is one way in which residents, especially those in the poorest socioeconomic stratum, are supplementing their protein content. Nearly all households, regardless of SES, reported using indigenous spinach with many also reporting consumption of wild fruit, highlighting the importance of natural resources in nutrient supplementation regardless of wealth.

(Table 4 here)

(ii) *Access*

As is evident from the previous section, not all the food that people consume is grown at home or gathered from the wild. In the households sampled, a significant number do not grow sufficient crops to feed all of their members ($c2 = 28.3$; $p<0.001$). Although 81% of respondents grew maize in their own plot over the last year ($c2(1) = 19.78$; $p < 0.001$), 97% of households still bought maize ($c2(1) = 52.75$; $p<0.01$). In this study, a GLZ model based on data collected from the food security survey (Appendix 2) showed that the main factor given for insufficient food being grown to feed all the members of the household was inadequate rainfall (Wald value = 80.749; $p<0.001$). This indicates the vulnerability of households that grow crops to climate variability, which is projected to get more extreme under climate change (Boko et al. 2007). Any policy focusing on increasing agricultural production therefore needs to include strategies for adapting to a changing (more variable) climate.

When insufficient crops are grown to feed all the members of the household, household members buy their food from the market ($c2 (1) = 44.17$; $p <0.001$). After maize, rice (53%) and bread (49%) are the two staples most often consumed by household respondents. These commodities must be purchased, as rice cannot be grown in the area, and the bread referred to is processed, sliced bread, not home-baked. Purchasing food is therefore an important food security strategy for most households in the area. The role of local stores as food provisioning agents in the local food system is explored in the next sections. Given their centrality within household food security strategies, they are important actors in the food system with the potential to increase the community's capacity to adapt to change. For example, they could form a buffer to both exogenous shocks (e.g., natural disaster cutting off access to supply from wholesale suppliers) and endogenous shocks (e.g., low yields on local plots as a result of a drought) by providing a space in which households can access food without needing to travel long distances.

In order to buy food, households must have an income. Livelihood strategies are therefore of key importance to food security strategies as they determine the purchasing power of households. Nearly all (99%) households in the survey reported at least one source of income, which included permanent and temporary or piecemeal jobs, social grants from the government (either old-age pensions or child welfare grants), and self-employed work in the informal sector (e.g., selling clothes or other goods, building, traditional healing). As expected, having more sources of income for

a household was associated with increased socioeconomic status in terms of assets: households in the lowest socioeconomic tier had an average of 2.06 sources, compared to 2.4 for those in the middle tier and 3.12 among those in the highest tier ($F(2,91) = 3.97$; $p = 0.022$) (Table 5). A full 84% of study households were reliant in part on social grants as a form of income, emphasizing the importance of this safety net in rural livelihoods, regardless of SES.

(Table 5 here)

Our results from the GLZ model showed that although the only significant means for getting food was to buy it (Wald stat = 155.508; $p<0.001$), other strategies were also employed. The next most popular was to receive food from neighbors, friends or relatives- emphasizing the important role of social capital in the community. Some households also made use of governmental food aid and some borrowed money to buy food. However, this formal assistance is meant as a short-term solution (approximately three months) and is not a strategy to be employed in the long-term.

Although most households met their food requirements for the year previous to the study ($c2(1) = 28.3$; $p<0.001$), 10 out of the 13 households that did not (77%) cited lack of money at home as the primary reason. Our survey revealed a number of coping mechanisms being employed by households when they did not have sufficient money to buy food (Table 6). Although most of the coping mechanisms are short-term solutions, one that could be developed into a long-term adaptive strategy is the formation of grocery collectives, discussed in greater detail in the following section.

(Table 6 here)

It is worthy to note the discrepancy between assets and income. Table 6 shows the extent to which high SES households are still vulnerable because their assets are not directly liquid and their income sources are compromised. As Table 5 shows, 60% of high SES households depend on a family member with a permanent job as a source of income. Misselhorn (2009) and Hendriks et al. (2006) refer to the negative impacts on food security that could arise from an increased dependency on formal employment because these households are more vulnerable to the loss of this single source of income. Diversifying the methods for accessing food can build a household's resilience to food security shocks.

3.2 *Qualitative results: The role of the retail sector*

The data presented above demonstrate that, since not all food is grown, purchasing food is a key food security strategy that directly impacts the nutritional quality of food that people consume, with further implications for food security. Below are the results from qualitative data: first, we provide an overview of where food can be bought in the AHDSS along with the role that the retail sector plays in making food available to residents in the area. Of particular importance is the role that private actors play in overcoming barriers to access; for example, lowering the distance communities travel to access food by incorporating these transport costs into their business model. Second, we discuss a particularly adaptive strategy employed by some households in order to make buying food more affordable: the formation of grocery collectives.

(i) *Supply mediated through local entrepreneurs*

There are a number of avenues through which community members can buy food. In most of the villages, there are spaza shops, cafés and 'Indian' stores within easy access (at least one per village), although the prices and availability of different food products differ dramatically among the different stores. Often located outside these stores (which sold more processed foods) were street vendors selling fresh produce such as tomatoes, avocados and even dried mopane worms (see Figure 2). Closer to the main, paved roads, there are also general dealers and 'Indian' general dealers, which have more stock, generally at cheaper prices. Major South African retailers as well as more general dealers can be found in neighboring urbanized areas together with larger fresh produce markets, such as that in Thulumahashe (See Figure 3) and Hazyview. The majority of shop owners in the villages buy their produce from a large wholesaler in the town of Hazyview,[11] about 40 kilometers from the primary research village, Agincourt. Storeowners would always calculate their prices based on those received from the wholesaler. One exception to this was an 'Indian store' where the owner said that they often come together with friends in order to buy stock or they buy from the larger 'Indian' store in Thulumahashe because they get good deals. Sometimes they do not make a profit on certain items, selling them at cost to keep people coming to the shop.[12]

[11] The Metro Cash 'n Carry

[12] This practice can cause ethnic tensions within the community as South Asian storeowners outcompete locals by drawing on their many family and friendship ties. The result of these deals has been to foster a feeling of antagonism among store owners from different ethnic backgrounds, especially as people not originally from the community are not allocated land by the chief and must often marry into the local community or rent space from locals in order to operate their business.

Figure 2: Woman selling fresh produce from a stall outside the biggest café in central Agincourt

Figure 3: Women selling fresh produce outside the main shopping center in Thulumahashe

The role of social capital in this situation is interesting: South Asian entrepreneurs capitalize on extensive kinship networks (i.e., bonding capital) in order to build successful businesses. However, these ties allow them to outcompete locals, raising inter-ethnic tensions within the community. Reconciling these tensions could be a step forward in building social capital (specifically bridging capital, in the case of the store owners) within the whole community, thereby reducing its vulnerability to shocks (see Misselhorn 2009 for more on the role of social capital in building adaptive capacity). The role of social capital in the creation of adaptive capacity is further explored in the case of "grocery collectives" below.

Related to the issue of social capital and trust is the prevalence of hijackings in the site. Together with the bad road access (the only paved road goes just past Thulumahashe, a peri-urban centre outside of the AHDSS site), safety could be a major reason why there were no supermarkets operating outside of urban centers in this area because it makes delivery very difficult. Bread was the only product being delivered to the local stores on a daily basis at the time of the study, with the truck traveling around to each of the cafés and the spaza shops that can afford it. When questioned about their routes and delivery timings, the truck drivers became very secretive mentioning that they are frightened of being hijacked and would not divulge this information. This indicates that one of the impediments to having produce delivered to the area is the fear of products being stolen. It is clearly lucrative enough for bread companies to take on this risk, but if the risks were reduced, other foodstuffs could also be delivered. A further problem associated with food delivery was identified by the manager of a retailer in Thulamahashe: bread delivery trucks would only arrive at 4.30pm, which was too late as most people expected their bread fresh in

the morning.[13] This could have various reasons: the poor road infrastructure, a monopoly by the only bread company that is willing to deliver to the area resulting in storeowners being at their mercy, or even the time constraints of only one truck having to deliver to all the shops in the vicinity because the risks of sending more. The safety and efficiency of transport in and around rural areas is therefore also of key concern for building food system resilience.

(ii) *Constraints*

There are two main constraints on operating small food businesses in the villages.[14] The first is transporting products from the wholesalers in the urban centers back to the shop. Those businesses where the owner had a "bakkie" (small truck) were far better stocked (see Figure 4) than those for which the owner had to travel by taxi (see Table 7) and bring back stock by hand (see Figure 5). This latter mode of transport limits both the type of stock that is available and how often that stock can be replenished; it affects not only the storeowner, but increases the costs of accessing food for all consumers that do not have a retailer near to where they live. One of the major complaints was that quite often stock expires before it can be sold, resulting in a loss for the owners. This is true even for non-perishable items such as tinned beans. This also has dietary implications (again evoking the "nutrition transition") because quite often the cheapest foods available are "junk foods" like chips and sweets, which are often the only items reliably purchased from the shops. The refrigerators were also mainly used to keep soft drinks and sometimes alcohol. Rather than being sold in the stores, fresh produce is hawked from the side of road or outside spaza shops and cafés. There is a standard set of prices for these items (mainly spinach, potatoes, avocados, onions, tomatoes and citrus fruits) across most of the AHDSS site except for tourist areas, where prices are considerably higher.[15] This fresh produce was often trucked in from farms in Limpopo province, indicating the importance of rural transport networks and trading from the back of "bakkies" (See Figure 6) that should be the subject of further study. As the data indicate, some households also grow their own fresh produce to supplement their nutritional requirements (Table 3).

[13] They are now looking for building permission to add a bakery onto their premises at which point they will start selling cheap bread again. However, until then the store is not selling bread.

[14] While land tenure is an important aspect of rural food security in South Africa (See Pereira 2012), it was not a primary constraint identified in this study.

[15] For example, a bag of oranges cost R8 at Mkhuhlu market, R10 from street vendors in Agincourt and R20 at the Hazyview market where the stall owners said that they are mainly catering for tourists and some locals.

Figure 4: A woman in her spaza shop that is barely stocked with provisions

Figure 5: A fully stocked Café in Agincourt village where the staff and products are protected behind iron bars

Figure 6: Hawkers would often sell produce from the back of the "bakkies" in which they transported fresh produce.

(Table 6 here)

The second major constraint was a lack of start-up capital. There was a stark contrast between those shops where the owner had adequate cash flows to buy sufficient stock, invest in a "bakkie" and staff to help sell products and those that did not (see Figures 4 and 5). Often the latter had suffered a major financial setback. In one case the owner had passed away and in another the main breadwinner had lost his job and so was unable to provide capital to keep the business afloat. In the case of one of the more successful enterprises, the original owner had won the lottery and had invested it in growing his business, which meant that even after he had passed away, there was sufficient capital to keep the business profitable. The fact that most of these enterprises required additional income to remain viable also highlights the high working capital required to conduct business in rural areas. Increasing access to short-term capital and education in financial planning could go a long way towards building the resilience of the food system in the community.

The alternative option for buying food is to make the journey into the urban and peri-urban centers to purchase it from one of the supermarket retailers or wholesalers there.[16] Some women have formed grocery collectives in order to make this a more viable option and this strategy is discussed in the next section.

3.3 *Qualitative results: the establishment of grocery collectives*

[16] Interestingly, most storeowner respondents said that they were providing a service to the community as they allowed for people to access food with convenience instead of paying the taxi fare to the nearest urban centre (Table 7). The provision of credit and wholesale specials were also given as reasons for justifying their service to the community. The special offers to residents include the provision of credit, especially to pensioners who can guarantee that they will pay their debts. Preference is also restricted to local residents as in some cases customers from different villages defaulted on their debts and subsequently left the region. This follows the conventional wisdom that the provision of credit is a benefit of traditional retailers (Minten et al. 2010).

The establishment of grocery collectives is a notable mechanism through which household food providers in the community (almost exclusively female) have increased their purchasing power and attempted to improve their overall food security by harnessing the power of social capital. These groups serve as a form of Accumulating Savings and Credit Association (ASCA) or "stokvel" in which monthly contributions are collected from members and then pooled to purchase a collection of food staples in bulk from local wholesalers at least once a year, usually before the December holidays, when many relatives may come to visit (thus dipping into the household's food stocks) and household expenditures increase dramatically.

Almost twelve percent (11.7%) of study households reported being a member of one or more of these groups, with the greatest participation reported from households in the top socioeconomic tercile (18.2%). Although largely absent from the literature, the phenomenon does not seem to be confined to the region of study, with the few isolated references to similar groups reported from regions in the Eastern Cape (Bähre 2002) and Cape Town (Du Toit 2005).[17]

Most of the grocery collectives discussed in qualitative interviews were composed of around 10-12 female members, though several sources reported being involved with much larger groups (usually comprising extended family networks). Informants from the smaller groups, which are the focus of this section, reported that membership was usually capped, with defaulting members replaced by trusted women who had expressed prior interest in joining the group. According to the women, membership for these groups was based primarily on geographic proximity as well as willingness (and ability) to pay the monthly fee, which ranged between R100 and R150 (the equivalent of $15-25 USD at the time of the study). In several cases, sources mentioned the large number of individuals within their neighborhood who were interested in joining the group but unable due to the group's already having reached "capacity," which was set at twelve.

Almost all groups reported the purchase of several key staples mentioned above, including flour, maizemeal, rice, sugar, and fish/cooking oil, as well as household cleaning products such as washing powder. In addition to these items, several groups (especially those on the upper end of the monthly contribution spectrum) reported purchasing other less essential products, such as dairy creamer, canned beans, tomato sauce, packaged soups, canned spinach, and mayonnaise. These products are collectively purchased at negotiated and/or reduced group rates from regional food wholesalers and then transported back to the Agincourt area, where they are then divided evenly among group members (or proportionally, in cases where one or more members were unable to make all twelve payments). In some instances, this transportation is provided to the group by the wholesaler. In others, the group relies on its accumulated social capital to gain access to a vehicle for the day to transport the products. The groceries usually last through May, providing temporary relief to the household while it replenishes its cash and food stocks in the wake of the holidays.[18]

[17] These can be traced back to the apartheid era when migrant workers would form a grocery collective in order to save money to bring food and presents back home (Bähre 2002).

[18] In addition to allowing household food providers to "save" money throughout the year in preparation for the holidays and to guarantee enough food to go around in the summer, these grocery collectives may also act as temporary moneylenders in rare cases when members need to take out a short-term loan, for example. In this case, the borrowed money accrues monthly interest at the level of 20%. The

Although grocery collectives can be viewed as particularly innovative strategies for building food security, they can still exclude the most vulnerable. As Misselhorn (2009) points out, while stokvels can be useful mechanisms for reducing the costs of buying food and serve as a lending source, they require members to have access to sufficient capital to be able to join and if for some reason a member falls on hard times, they can be excluded from the group. Under these circumstances, grocery collectives cannot be the only response to food insecurity.

4. DISCUSSION

An overall trend that grounds many of this study's findings is the process of deagrarianization together with climate variability and in particular erratic rainfall patterns. These processes have resulted in rural communities' access to food being mediated by their ability to derive an income with which to buy food (rather than growing it on their own), which has, in turn, led to the establishment of local food stores that have made use of an expansion of more formal food retail from urban into peri-urban areas. Our research shows that the main food security strategy adopted by households is now to buy staple foods like maize meal, rice and flour/bread rather than grow them, a finding that has been supported by other studies, (e.g., Altman et al. 2009). Crops grown at home or in small plots are used to supplement diets and, in rare cases, to provide additional income. This situation has two implications: 1) a general trend of diversification out of agriculture as a key income sector for smallholders, reinforcing the concept of deagrarianization, and 2) a reliance on the retail sector for food provision (similar to that in urban areas, although there is more capacity for growing supplementary food in rural areas).

These processes have divided households into a spectrum of 'winners' and 'losers' spanning those that are sufficiently economically well-off to be able to buy their own food, but who also grow food to supplement their diets, through to those households that are wholly dependent on buying their staple foods as well as fresh produce and meat from stores with whatever money they can earn or receive from government grants. Entrepreneurs are similarly divided along a spectrum of those who can provide a service to their community because they have enough working capital to stock goods in their store and have access to transport these goods from wholesalers through to those who are failing because they can no longer afford to buy stock and have no means of getting it to their stores. When these stores fail it adversely affects access for the entire community. In order to build an adaptive food system, the needs of the full spectrum must be taken into account[19].

---

interest is used to purchase more groceries with the yearly order, which are then divided evenly among the group.

[15] The ability to access food by those who are unemployed and do not qualify for social grants is therefore severely compromised and, furthermore, changes intra-household dynamics considerably.

[16] This trend mirrors that seen in other emerging economies like Mexico, where the access to less healthy foods by poorer households is increasing, resulting in malnutrition from obesity as opposed to lack of calories (FAO 2011).

[19] There is also another class of individuals that needs to be considered; those who fall through the cracks of the grant system and therefore do not have access to any financial safety net. This category comprises the most vulnerable— undocumented migrants, in particular, who are often not considered, but who make up an increasingly larger part of the fabric of rural communities in South Africa. Another large group of vulnerable South Africans that fall outside the net of social assistance are adults

These trends have further implications for food utilization, with potentially devastating effects on those with the most limited means since, despite their importance in food security, micronutrients are often not included in food security interventions that tend to focus on daily caloric intake. The industrialization of food, leading to greater access to processed, fattier, cheaper foods along with increased dependence on purchased food among the poor and middle classes in developing countries, is of mounting concern for achieving food security goals and requires policy intervention (Hawkes 2006; Cordain et al. 2005; Kastner et al. 2012).

Socio-economic status combined with how the local food system is structured therefore influences access not only to macronutrients, but also to micronutrients. Currently, lower income groups mainly access their micronutrients from fruit and vegetables that they can buy from hawkers who source their produce from farms in the region.[20] If there is a shock to local production, there is unlikely to be sufficient excess supply to meet the demands of the local population without a concomitant increase in prices. Furthermore, the environmental degradation resulting from unlimited harvesting makes a reliance on wild foods a limited food security strategy, especially in densely populated areas (Kirkland et al. 2007; Fisher et al. 2011; L. M. Hunter et al. 2011). In this system, it is also unlikely that local suppliers will start selling fresh produce bought from urban retailers because perishables need to be supplied fresh and would thus require making trips into town far more frequently than they currently do (once or twice a month). This leaves poorer households not only vulnerable to macro-economic and climatic shocks impacting their access to staple foods, but their micronutrient intake too.

Ziervogel and Eriksen (2010: 532) stress that food security responses must 1) recognize the interconnectedness of urban and rural areas and 2) move beyond a promotion of agriculture as the sole contributing factor to food security for rural populations. Our findings support recent interest in building viable smallholder agriculture for addressing rural poverty and food security (Wiggins et al. 2010), but stress the necessity of developing the whole food system, not just agricultural production. The case for involving the retail sector in food policies at local, national, and even international levels is therefore strong, as also appreciated by Timmer (2009).

This study therefore calls for a systemic approach to food security in the region that takes into account interactions between different levels of the system. This entails building individually resilient, yet interdependent food systems that can buffer shocks between levels (see Figure 7). At the local level, there needs to be targeted support for sustainable production by *all* households. Stimulating domestic food production is in the South African government's interests because it will meet the community's micronutrient requirements while meeting rural development targets for agriculture of establishing 300,000 households in smallholder schemes through restructuring the land reform process (Republic of South Africa 2010). At the same time, there should be a strategic focus on building the capacity of local storeowners who are currently

---

between the ages of 18 and 59, especially men, who are usually not primary care givers able to make use of the child care grant system (Brockerhoff 2010). This is an issue of great concern for any adaptive food or rural development policy under the NGP.

[20] An alternative option exists in harvesting communal natural resources such as wild fruit or edible insects, though even these resources may be disproportionately accessible to higher SES families with greater access to transportation (Table 6).

the key actors through whom the community accesses their staple foods. A focused intervention that examines the various barriers to entry and the sustainability of business models is vital in order to sustain and develop these important nodes in the rural food system. Furthermore, improving basic transport infrastructure is a simple, yet vital intervention in the area, but its implementation requires the co-ordination of governmental departments that are historically not involved with food security policy, e.g. the Department of Public Works. Overcoming the barriers to departmental integration and thus aligning strategies is probably the biggest challenge facing rural food policy in South Africa (Pereira and Ruysenaar 2012).

(Figure 7 here)

Figure 7: A multi-level approach to building a resilient food system. The diagram outlines various interventions at different levels that could build the adaptive capacity of the overall system by encouraging flows between different levels while maintaining the individual functionality of each.

5. CONCLUSIONS

The food system consists of both formal and informal components of small-scale manufacturing enterprises, local traders, and farmers. It is necessary to acknowledge the full spectrum of actors when addressing issues of building adaptive capacity in the food system. However, the role of private-sector actors in the developing world, especially within SSA, has largely been neglected by food policy analysts and government.[21] Our results illustrate the importance of considering the role of retail in rural areas as a key part of any rural food policy strategy.

The communities of Agincourt are exposed to four macro-trends; globalization and climate change on an international level, deagrarianization and the expansion of the retail sector at the local level. These changes are occurring within the policy context of the South African government's focus on rural development (Republic of South Africa 2010). Given these contextual factors, our findings can be summarized into the following 10 points:

1. Through a combined process of deagrarianization and climate variability, rural areas in South Africa have diversified away from agricultural production and now exist on increasingly complex livelihood networks dependent on migration/remittances, state grants, and other forms of income.
2. While a number of rural households still maintain homestead gardens to supplement their diets, such gardens are increasingly confined to households at the upper ends of the socioeconomic spectrum with the natural, human and financial capital to be able to devote to such non-remunerative productivity.
3. Lacking the land and resources to maintain supplementary homestead gardens, the poorest households are becoming the *most* dependent on purchasing food

[21] The most detailed study to date has been of the role of modern retail in Delhi, which showed that modern retail is generally less expensive than traditional retail (e.g., wetmarkets) even for fresh produce, but that the poorest may not benefit (Minten et al. 2010). However, the Delhi study involved a large, urban area whereas the situation in South African rural areas has been understudied, despite these areas suffering from higher levels of food insecurity than urban areas (Misselhorn 2009).

in an attempt to meet their basic nutritional requirements. This has important negative implications on their quality and diversity of their diets, in particular micronutrient intake as most of the cheapest food is highly processed and full of refined sugars and fats.

4. Although socioeconomic status is positively associated with overall food security, given the extent to which all households now rely primarily on purchasing food and the volatility of income sources, even households with comparatively high asset indices are routinely experiencing insecurity, emphasizing the importance of income and access to savings institutions in building food security.
5. This replacement of agricultural production by food purchase as a main food security strategy has led to the establishment of a diverse range of food businesses to fill the food availability gap. This in turn creates a positive feedback loop further stifling agricultural production as food purchasing replaces production. These food retailers range from small-scale, local storeowners who provide a range of products depending on their own socio-economic status and assets through to large, formal retailers who are now operating in peri-urban areas.
6. However, in their expansion, these suppliers face prohibitive obstacles, especially involving security and transport infrastructure, which increase their operational expenses and need for working capital—costs that are then either transferred to the consumer or become prohibitive, preventing these businesses from providing a useful service to the community.
7. In the face of limited access to formal mechanisms to save and substantial obstacles in reaching the most affordable private-sector providers, some rural households have used the "*stokvel*" model to pool savings to be able to purchase and transport staple commodities in bulk from major regional suppliers. This model, although effective, can also exclude the most vulnerable individuals who cannot meet the basic income requirements to join these groups.
8. Rural households are highly dependent on social grants as a form of income; however, an adaptive food system cannot be built upon a reliance on external social assistance. Although there is clearly an important role for safety nets, especially under circumstances of volatile prices, production losses, and chronic poverty (Ziervogel and Ericksen 2010), they alone do not constitute a sustainable intervention.
9. The academic food security community has so far underappreciated the importance of retail-sector actors in rural food system and has instead focused on agricultural production. This has left significant gaps in understanding the rural economy with implications for rural food policy, especially for economies in transition.
10. It is imperative that this gap is addressed if all three elements of food security in rural areas are to be achieved. As such significant actors in the rural food system, private food retail businesses need to be central in future food policy strategies. Employing a systemic approach to food security issues (that includes the needs of the retail sector), highlights the need for effective co-ordination between governmental departments in order to meet these needs.

Our study was limited by the need to describe the food system in the area while also providing empirical data about food security coping strategies. However, it provides a platform for more in-depth studies on food security in the area. In particular, it opens up new areas for policy research on the role that the retail sector can play in rural development- for instance, the role of supermarkets as sources of microfinance, which was an unexplored finding of our study that reinforces the complexity of the roles undertaken by the public and private sectors in rural development. This systematic approach that accounts for all three elements of food security has identified a gap in rural food policy that needs to be filled- a job that will require the co-ordination and integration of public- and private-sector actors that do not normally interact. This can be seen as the first step towards achieving Bohle's (2009) adaptive food governance and will hopefully lead to better food policy that is grounded in the reality of the food system as it is actually experienced.

ACKNOWLEDGEMENTS

We are grateful to the University of the Witwatersrand/Medical Research Council's Rural Public Health and Health Transitions Research Unit (Wits/MRC Agincourt Unit) for their support with logistics, fieldworkers, data, administration, and advice. This work was indirectly supported by the Wellcome Trust (grant 085477/Z/08/Z) through its support of the Agincourt Health and Demographic Surveillance System. The authors would also like to acknowledge their individual funding bodies, the Fulbright scholarship, the Oxford Clarendon Scholarship Fund, the Commonwealth scholarship, the Future Agricultures Consortium and extend their thanks to Stacey Gouws for her contribution to data collection.

Table 1A. *Consumption of different food groups over 14-day period, by socioeconomic status (SES)*

Food group	% total households	% low SES (n = 31)	% mid SES (n = 30)	% high SES (n = 33)	p-value, (df=2)
Grains	98.94 (93)	96.77 (30)	100.0 (30)	100.0 (33)	0.358
Sweets	96.81 (91)	93.55 (29)	96.67 (29)	100.0 (33)	0.340
Other*	94.68 (89)	93.55 (29)	93.33 (28)	96.97 (32)	0.767
Vegetables	93.62 (88)	93.55 (29)	90.00 (27)	96.97 (32)	0.528
Meat	91.49 (86)	90.32 (28)	93.33 (28)	90.91 (30)	0.905
Fruits	89.36 (84)	87.10 (27)	90.00 (27)	90.91 (30)	0.877
Fats	89.36 (84)	87.10 (27)	90.00 (27)	90.91 (30)	0.877
Dairy	71.28 (67)	51.61 (16)	70.00 (21)	90.91 (30)	0.002***
Eggs	62.77 (59)	48.39 (15)	76.67 (23)	63.64 (21)	0.062*
Legumes	54.26 (51)	48.39 (15)	56.67 (17)	57.58 (19)	0.724
Fish	36.17 (34)	35.48 (11)	30.00 (9)	36.36 (12)	0.850
Tubers	34.04 (32)	25.81 (8)	33.33 (10)	48.48 (16)	0.156

Figures in parentheses are number of households.

[a] Significance of Pearson χ^2

[*] Significance at the 10% level

[**] Significance at the 5% level

[***] Significance at the 1% level

Table 1B. *Consumption of different food groups over 24-hour period, by SES*

Food group	% total households	% low SES (n = 31)	% mid SES (n = 30)	% high SES (n = 33)	p-value (df=2)
Grains	94.68% (89)	87.10% (27)	100.0% (30)	96.97% (32)	0.062*
Sweets	93.62% (88)	87.10% (27)	93.33% (28)	100% (33)	0.108
Other*	93.62% (88)	90.32% (28)	93.33% (28)	100% (33)	0.209
Fats	78.72% (74)	74.19% (23)	76.67% (23)	84.85% (28)	0.550
Vegetables	74.47% (70)	74.19% (23)	73.33% (22)	75.76% (25)	0.975
Fruits	71.28% (67)	70.97% (22)	66.67% (20)	75.76% (25)	.0.727
Legumes	42.55% (40)	41.94% (13)	43.33% (13)	42.42% (14)	.0.994
Meat	40.43% (38)	35.48% (11)	43.33% (13)	42.42% (14)	0.789
Dairy	40.43% (38)	19.35% (6)	43.33% (13)	57.58% (19)	0.007***
Eggs	25.53% (24)	22.58% (7)	26.67% (8)	27.27% (9)	0.898
Tubers	11.70% (11)	12.90% (4)	6.67% (2)	15.15% (5)	0.560
Fish	10.64% (10)	0.00% (0)	13.33% (4)	18.18% (6)	0.052*

Figures in parentheses are number of households.

[a] Significance of Pearson χ^2

* Significance at the 10% level

** Significance at the 5% level

*** Significance at the 1% level

Table 2. *Prevalence of cultivation within homestead gardens at time of data collection, by crop (n = 94)*

Crop	% households cultivating	Frequency
Maize	50.0	47
Onions	29.7	28
Tomatoes	26.6	25
Spinach	23.4	22
Cabbage	18.1	17
Carrots	13.8	13
Sugar cane	11.7	11
Beetroot	8.5	8
Bananas	3.2	3
Green peppers	3.2	3
Lettuce	2.1	2
Mangoes	2.1	2
Papaya (Pawpaw)	1.1	1
Beans	1.1	1
Cucumbers	1.1	1
Peanuts	1.1	1

Table 3. *Prevalence of cultivation both inside and outside of homesteads at time of data collection, by SES (n = 94)*

Group	% cultivating in group	Frequency
All socioeconomic groups (n = 94)	50.0	47
Lower socioeconomic status (n = 31)	32.3	10
Middle socioeconomic status (n = 30)	50.0	15
Higher socioeconomic status (n = 33)	66.7	22

Table 4. *Household consumption of natural food products and prevalence of harvesting versus purchasing or receiving as a gift, by SES [% in brackets]*

Natural food product	% total	% low SES	% mid SES	% high SES	p-value (df=2)

	households	(*n* = 31)	(*n* = 29)	(*n* = 33)	
Indigenous spinach	98.92 (91) [84.27]	100 (31) [96.55]	100 (29) [78.57]	96.97 (32) [78.13]	0.399
Wild fruit	80.65 (75) [94.59]	87.1 (27) [100]	72.41 (21) [85.71]	81.82 (27) [96.30]	0.347
Edible insects	59.14 (55) [55.56]	70.97 (22) [47.62]	55.17 (16) [56.25]	51.52 (17) [64.71]	0.249
Wild-caught fish	15.05 (14) [28.57]	19.35 (6) [33.33]	13.79 (4) [50.0]	12.12 (4) [0]	0.702
Wild birds for meat	8.60 (8) [77.78]	9.68 (3) [100]	10.43 (3) [75]	6.06 (2) [50]	0.807
Honey from the bush	7.53 (7) [83.33]	3.23 (1) [100]	17.24 (5) [100]	6.06 (2) [50.0]	0.125
Wild animals for meat	6.45 (6) [33.33]	6.45 (2) [50.0]	3.45 (1) [0]	9.09 (3) [33.33]	0.666

Figures in parentheses are number of households.

[a] Significance of Pearson χ^2

Table 5. *A breakdown of different sources of income, by SES*

Income source	All households (*n = 94*)	Low SES (*n* = 31)	Mid SES (*n* = 30)	High SES (*n* = 33)
Permanent job[*]	44.68%	29.03%	43.33%	60.60%
Mean people employed per qualifying household (SD)	1.452 (0.705)	1.556 (0.882)	1.308 (0.630)	1.50 (0.688)
Temporary job	27.66%	23.33%	30.00%	30.30%
Mean people employed per qualifying household (SD)	1.269 (0.667)	1 (0)	1.111 (0)	1.6 (0.966)
Social grant	84.04%	80.65%	86.67%	84.85%
Mean people employed per qualifying household (SD)	1.494 (0.749)	1.4 (0.645)	1.46 (0.81)	1.607 (0.786)
Informal work	20.43%	22.58%	10.00%	34.38%
Mean people employed per qualifying household (SD)	1.05 (0.510)	1 (0)	1 (0)	1.222 (0.667)

[a] Significance of Pearson χ^2

[*] Significance at the 5% level

Table 6. *Coping mechanisms for getting food, by SES*

Coping mechanism	% total households (*n* = 94)	% low SES (*n* = 31)	% middle SES (*n* = 30)	% high SES (*n* = 33)
Asking neighbors, friends, or relatives for food	36.17 (34)	41.94 (13)	33.33 (10)	33.33 (11)
Sending children to eat at other homes because of lack of food	19.15 (18)	22.58 (7)	23.33 (7)	12.12 (4)
Making trades with others involving food	22.34 (21)	22.58 (7)	16.67 (5)	27.27 (9)
Receiving help in harvesting crops from someone outside the household	9.57 (9)	12.90 (4)	13.33 (4)	3.03 (1)
Borrowing money from someone outside the household	53.19 (50)	51.61 (16)	60.00 (18)	48.48 (16)
Getting a ride from non-family member to be able to harvest natural resources far away	5.32 (5)	0.00 (0)	6.67 (2)	9.09 (3)
Receiving food from Social Services	4.26 (4)	6.45 (2)	0.00 (0)	6.06 (2)
Receiving food from a church or	5.32 (5)	12.90 (4)	3.33 (1)	0.00 (0)

charitable organization				
Joining grocery group to bulk order staple foods and kitchen supplies	11.7 (11)	6.45 (2)	10.0 (3)	18.2 (6)
Cutting preferred foods from diet to save money	80.85 (76)	80.65 (25)	80.00 (24)	81.82 (27)
Limiting diversity of diet to cut costs	78.72 (74)	77.42 (24)	86.67 (26)	72.73 (24)
Eating less desirable food to cut costs	81.91 (77)	80.65 (25)	83.33 (25)	81.82 (27)
Eating smaller meals because of lack of food	76.60 (72)	77.42 (24)	80.00 (24)	72.73 (24)
Eating fewer meals/day because of lack of food	77.66 (73)	77.42 (24)	80.00 (24)	75.76 (25)
Going to sleep hungry	18.09 (17)	22.58 (7)	23.33 (7)	9.09 (3)
Fasting (i.e., not eating for a whole day)	18.09 (17)	22.58 (7)	23.33 (7)	9.09 (3)

Figures in parentheses are number of households.

Table 7. *Taxi prices from Agincourt to urban centers in the area*

Town	Price (ZAR)
Hazyview	R46
Bushbuckridge	R24
Thulamahashe	R21

WORKS CITED

Adams, M., Cousins, B., & Manona, S. (1999). Land tenure and economic development in rural South Africa: constraints and opportunities. *Working Paper 125*. London: Overseas Development Institute.

Adger, W. N., Hug, S., Brown, K., Conway, D., & Hulme, M. (2003). Adaptation to climate change in the developing world. *Progress in Development Studies, 3*, 179-195.

Aliber, M. (2003). Chronic poverty in South Africa: incidence, causes and policies. *World Development, 31*(3), 473-490.

Altman, M., Hart, T., & Jacobs, P. (2009). Household food security status in South Africa. *Agrekon, 48*(4), 345-361.

Anabwani, G., & Navario, P. (2005). Nutrition and HIV/AIDS in sub-Saharan Africa: an overview. *Nutrition, 21*, 96-99.

Ashley, C., & Maxwell, S. (2001). Rethinking rural development. *Development Policy Review, 19*, 395-425.

Babulo, B., Muys, B., Nega, F., Tollens, E., Nyssen, T., Deckers, T., et al. (2008). Household livelihood strategies and forest dependence in the highlands of Tigray, Northern Ethiopia. *Agricultural Systems, 98*, 147-155.

Bähre, E. (2002). Money and violence: financial mutuals among the Xhosa in Cape Town, South Africa. *Dissertation*. Amsterdam: University of Amsterdam.

Bohle, H. G., Etzold, B., & Keck, M. (2009). Resilience as agency. *IHDP Update, 2*, 8-13.

Boko, M., Niang, I., Nyong, A., Vogel, C., Githeko, A., Medany, M., et al. (2007). In M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden, & C. E. Hanson (Eds.), *Climate change 2007: impacts, adaptation and vulnerability* (pp. 433-467). Cambridge, UK: Cambridge University Press.

Brockerhoff, S. (2010). Monitoring the progressive realisation of socio-economic rights in South Africa: a review of the development of social security policy in South Africa. Johannesburg: Studies in Poverty and Inequality Institute.

Bryceson, D. F. (2002). The scramble in Africa: reorienting rural livelihoods. *World Development, 30*(5), 725-739.

Carter, M. E., & May, J. (1999). Poverty livelihood and class in rural South Africa. *World Development, 27*(1), 1-20.

Chambers, R., & Conway, G. R. (1991). Sustainable rural livelihoods: practical concepts for the 21st century. *IDS Discussion Paper 296*: Institute of Development Studies.

Coates, J., Swindale, A., & Bilinsky, P. (2007). Household food insecurity access scale (HFIAS) for measurement of food access: indicator guide (v. 3). *Food and Nutrition Technical Assistance Project*. Washington, D.C.: Academy for Educational Development.

Collinson, M. A. (2010). Striving against adversity: the dynamics of migration, health and poverty in rural South Africa. *Global Health Action, 3*, 5080.

Cordain, L., Eaton, S. E., Sebastian, A., Mann, N., Lindeberg, S., Watkins, B. A., et al. (2005). Origins and evolution of the Western diet: health implications for the 21st century. *American Journal for Clinical Nutrition, 81*(2), 341-354.

Delius, P. (1996). *A lion amongst the cattle: reconstruction and resistance in the Northern Transvaal*. Johannesburg: Heinemann.

Devereux, S., & Maxwell, S. (2001). *Food security in Sub-Saharan Africa*. London: ITDG Publishing.

Du Toit, A. (2005). Chronic and structural poverty in South Africa: challenges for action and research. *CSSR Working Paper*. Cape Town: Center for Social Science Research, University of Cape Town.

FAO (2010). The state of food insecurity in the world. Rome: Food and Agriculture Organization of the United Nations.

FAO (2011). The nutrition transition and obesity. http://www.fao.org/FOCUS/E/obesity/obes2.htm.

Fay, D. (2009). Land tenure, land use, land reform at Dwesa-Cwebe South Africa: local transformations and the limits of the state. *World Development, 37*(8), 1424-1433.

Fisher, J. T., Witkowski, E. T. F., Erasmus, B. F. N., Aardt, J. V., Ashner, G. P., Wssels, K. J., et al. (2011). Human-modified landscapes: patterns of fine-scale woody vegetation structure in communal savannah rangelands. *Environmental Conservation, 39*(1), 72-82.

Francis, E. (2002). Rural livelihoods, institutions and vulnerability in North West Province, South Africa. *Journal of Southern African Studies, 28*(3), 531-550.

Gelderblom, D., & Kok, P. (1994). Urbanization: South Africa's challenge. In *Volume 1: Dynamics*. Pretoria: HSRC Press.

Giannecchini, M., Twine, W., & Vogel, C. (2007). Land-cover change and human-environment interactions in a rural cultural landscape in South Africa. *The Geographical Journal, 173*(1), 26-42.

Hawkes, C. (2006). Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. *Globalization and Health, 2*(4).

Hendriks, S., Kirsten, J., & Vink, N. (2006). The effect of policies on food security and rural development in South Africa. *Journal of Development Perspective, 2*(1), 86-102.

Hunter, L., Twine, W., & Patterson, L. (2007). "Locusts are now our beef": adult mortality and household dietary use of local environmental resources in rural South Africa. *Scandinavian Journal of Public Health, 25*(Supplement 69), 8-20.

Hunter, L. M., Twine, W., & Johnson, A. (2011). Adult mortality and natural resource use in rural South Africa: evidence from the agincourt health and demographic surveillance site. *Society & Natural Resources, 24*(3), 256-275.

Kahn, K., Collinson, M. A., Gómez-Olivé, F. X., Mokoena, O., Twine, R., Mee, P., et al. (2012). Profile: Agincourt health and socio-demographic surveillance system. *International Journal of Epidemiology, 41*, 988-1001.

Kahn, K., Garenne, M. L., Collinson, M. A., & Tollmen, S. M. (2007). Research into health, population and social transitions in rural South Africa: a data and methods of the Agincourt health and demographic surveillance system. *Scandinavian Journal of Public Health, 35*(Supplement 69), 8-20.

Kastner, T., Rivas, M., Koch, W., & Nonhebel, S. (2012). Global changes in diets and the consequences for land requirements for food. *Proceedings of the Natural Academy of Sciences, 109*(18), 6868-6872.

Kennedy, G., Nantel, G., & Shetty, P. (2004). Globalization of food systems in developing countries: impact on food security and nutrition. *Food and Nutrition Paper 83*. Rome: FAO.

Kirkland, T., Hunter, L., & Twine, W. (2007). "The bush is no more": insights on institutional change and natural resource availability in rural South Africa. *Society & Natural Resources, 20*(4), 337-350.

Kruger, H. S., Puoane, T., Senekal, M., & van der Merwe, M. T. (2005). Obesity in South Africa: challenges for government and health professionals. *Public Health Nutrition, 8*(5), 491-500.

Lahiff, E. (2005). Land reform in the Eastern Cape: the ongoing struggle for resources and secure rights. *Social Dynamics, 31*(1), 39-57.

Madhavan, S., & Townsend, N. (2007). The social context of children's nutrition status in rural South Africa. *Scandinavian Journal of Public Health, 35*(Supplement 69), 107-117.

Marcus, T., Eales, K., & Wildshut, A. (1996). In *Down to earth: land demand in the new South Africa*. Durban: University of Natal Press.

Minten, B., Reardon, T., & Sutradhar, R. (2010). Food prices and modern retail: the case of Delhi. *World Development, 38*(12), 1775-1787.

Misselhorn, A. A. (2009). Is a focus on social capital useful in considering food security interventions? Insights from Kwa-Zulu Natal. *Development Southern Africa, 26*(2), 189-208.

O'Brien, K., & Leichenko, R. M. (2000). Double exposure: assessing the impacts of climate change within the context of economic globalization. *Global Environmental Change, 10*, 221-232.

Pereira, L. M. (2012). *Private sector adaptive capacity to climate change impacts in the food system: food security implications for South Africa and Brazil*. University of Oxford, Oxford.

Pereira, L. M., & Ruysenaar, S. (2012). Moving from traditional government to new adaptive governance: the changing face of food security responses in South Africa. *Food Security, 4*, 41-58.

Republic of South Africa (2010). The new growth path: the framework. Pretoria: Economic Development Department.

Republic of South Africa (2012). The 2011 National Antenatal Sentinel HIV & Syphilis Prevalence Survey in South Africa. Pretoria: National Department of Health.

Schmidhuber, J., & Tubiello, F. N. (2007). Global food security under climate change. *Proceedings of the Natural Academy of Sciences, 104*, 19703-19708.

Scoones, I. (2005). Sustainable rural livelihoods: a framework for analysis. *IDS Working Paper 72*. Brighton: University of Sussex Institute of Development Studies.

Seekings, J. (2000). Visions of society: peasants, workers and the unemployed in a changing South Africa. *Journal for Studies in Economics and Econometrics, 24*(3), 53-72.

Shackleton, C., & Shackleton, S. (2004). The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa. *South African Journal of Science, 100*, 658-664.

Simpkins, C. (1981). Agricultural production in the African reserves of South Africa, 1918-1969. *Journal of Southern African Studies, 7*, 256-283.

Swindale, A., & Bilinsky, P. (2005). Household dietary diversity score (HDDS) for measurement of household food access: indicator guide Washington, D.C.: Food and Nutrition Technical Assistance Project (FANTA).

Thomas, D., Osbahr, H., Twyman, C., Adger, N., & Hewitson, B. (2005). Adaptive: adaptions to climate change amongst natural resource-dependent societies in the developing world: across the Southern African climate gradient. *Tyndall Centre Technical Report 35*. Norwich: University of East Anglia Tyndall Centre for Climate Change Research.

Timmer, C. P. (2009). Do supermarkets change the food policy agenda? *World Development, 37*(11), 1812-1819.
Tollman, S. M. (1999). The Agincourt field site: evolution and current status. *South African Medical Journal, 89*(8), 853-858.
Twine, R., Collinson, M. A., Polzer, T. J., & Kahn, K. (2007). Evaluating access to a child-oriented poverty alleviation intervention in rural South Africa. *Scandinavian Journal of Public Health, 35*(Supplement 69), 118-127.
van Zyl, J., & Kirsten, J. (1992). Food security in South Africa, Agrekon: Agricultural Economics Research. *Policy and Practice in Southern Africa, 31*(4), 170-184.
Vogel, C. (2005). "Seven fat years and seven lean years"? Climate change and agriculture in Africa. *IDS Bulletin, 36*(2), 30-35.
Weiser, S. D., Young, S. L., Cohen, C. R., Kushel, M. B., Tsai, A. C., Tien, P. C., et al. (2011). Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS. *Am J Clin Nutr, 94*(suppl), 1729S-1739S.
WHO (2012). Obesity and overweight. *Factsheet 311*. Geneva: World Health Organization.
Wiggins, S., Kirsten, J., & Llambi, L. (2010). The future of small farms. *World Development, 28*(10), 1341-1348.
Wolpe, H. (1972). Capitalism and cheal labour-power in South Africa: from segregation to apartheid. *Economy and Society, 1*(4), 425-456.
Ziervogel, G., Bharwani, S., & Downing, T. (2006a). Adapting to climate variability: pumpkins, people and policy. *Natural Resources Forum, 30*, 294-304.
Ziervogel, G., & Ericksen, P. (2010). Adapting to climate change to sustain food security. *Advanced Review, 1*, 294-304.
Ziervogel, G., Nyong, A., Osman, B., Conde, C., Cortés, S., & Downing, T. (2006b). Climate variability and change: implications for household food security. *AIACC Working Paper 20*. Washington, D.C.: The AIACC Project.
Zimmerman, F. J. (2000). Barriers to participation of the poor in South Africa's land redistribution. *World Development, 28*(8), 1439-1460.