



SOUTHERN AFRICA
FOOD LAB

The Future of South Africa's Food System: What is research telling us?

by Laura M Pereira



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Introduction

The vitally important provision of food through the food system is not a simple linear process, but a contested outcome of a complex system. This systematic literature review was undertaken to better understand the inherent complexity of this system and inform a long-term scenario-planning process aimed at ensuring a food secure future in South Africa.

The past 40 years have seen an emphasis on the notion of ‘food security’, which was defined at the World Food Summit in Rome in 1996 as existing ‘when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life’ (FAO 1996: 2). However, the term ‘food security’ originates from the 1970s focus on national self-sufficiency where the main goal was to produce sufficient food domestically in order to decrease reliance on the international food market. This ‘productionist’ view of food security was premised upon the Malthusian idea that population would outstrip food production, making supply the key area of focus, which necessarily resulted in many interventionist and protectionist policies in the agriculture sector (Devereux & Maxwell 2001).

Despite the large increase in agricultural production resulting from the Green revolution, food insecurity was still apparent in many parts of the developing world, especially in Asia and Africa. As a result, in the 1980s a shift occurred towards a focus on world food stocks and import stabilisation as a means of achieving national food security; the self-reliance rather than self-sufficiency approach to food security. At the same time, Sen’s (1981) entitlement approach spurred a pivotal shift in understanding food security as access to food mediated through various means. First within the practitioner community and then later within the governmental sphere, it shifted the scale of food security analysis from the state level to that of the individual and his or her entitlements; where a person’s access to food became the focal point rather than agricultural production per se (Pereira 2012). This shifted the focus of achieving food security goals from increasing national production to ensuring that there was sufficient food available at national level.

The term ‘food sovereignty’ then gained credence as a response to the emphasis on global markets as the primary means of ensuring national food security. At the same summit where the definition of food security was agreed upon, the concept of food sovereignty was defined by the international movement La Via Campesina as the ‘right of each nation to maintain and develop their own capacity to produce foods that are crucial to national and community food security, respecting cultural diversity and diversity of production methods’ (Campesina 1996). Hospes (2014: 120) outlines how the concept of food sovereignty has led to a variety of proposals by social movements and NGOs, including:

the promotion of local production for local consumption, the development of small-scale, family and peasant farming, the protection of access to land or property rights of small farmers, pastoralists, and indigenous people; the promotion of women’s rights; agrarian and land tenure reform; the use of local, traditional knowledge in food production; protection of small farmers from patents on seeds, livestock breeds, and genes; non-GMO food; and equitable trade policies and anti-food dumping measures.

This expansion of the term food sovereignty from the original notion of national self-sufficiency into a movement centred on the right of peoples, in particular peasant farmers, to achieve self-sufficiency has sparked heated debates (see Agarwal 2014; Bernstein 2014; Jansen 2014; Li 2014). As Agarwal (2014: 1247) points out, there are contradictions in the

key tenets of the food sovereignty vision

between the goals of national and local food self-sufficiency; between promoting food crops and a farmer's freedom to choose to what extent to farm, which crops to grow, and how to grow them; between strengthening family farming and achieving gender equality; and between collective and individual rights, especially over land ownership.

While it is not within the scope of this review to delve into this debate, it is important to note the ongoing discussions on not only what constitutes food sovereignty but also how to achieve it.

Within this contested space, the food systems approach has been developed as a way of understanding that food security is the outcome of a complex articulation of multiple factors interacting across multiple levels (Ericksen et al. 2010). Food systems comprise a complex set of interlinked activities and outcomes of the commodity chain of production through to consumption. Food security, understood from the FAO (1996) definition, can be divided into three elements:

- food availability (the production, distribution and exchange of food)
- food access (the affordability, allocation and preference of food)
- food utilisation (the nutritional and social value of food and food safety)

These elements are outcomes from a set of activities and processes in the food system that also include social and environmental outcomes (Ericksen et al. 2010).

There are multiple, often contradicting, institutions that govern how food is produced, transformed, distributed, consumed and regulated. Acknowledging this complexity reinforces that the food system is not a simple, linear process that can be understood by a conventional supply chain, but rather a network, consisting of feedbacks and nonlinear relationships defined by concentrations of power and resources across different scales and levels. Considering that a key aspect of this review is to feed into the Transformative Scenario Planning process, for the purposes of this review, the components of the food system are understood as those defined by the Southern African Food Lab as:

- value chain inputs, mechanisms and structures for food production (land, water, crops, marine stocks), processing, distribution, access, preparation, consumption, metabolism and waste
- participants in the food system, including producers, fishers, industries, labour, governments, purchasers (retailers and buyers, brands, manufacturers, traders), communities and consumers
- social issues inherent in food equity, food justice, and food sovereignty and political and spatial considerations on local, regional, national and global levels.

Finally, the food system approach also allows for a more holistic appreciation that food security is not just about calorific intake but that the quality of food – as reflected in nutrient content, food safety and cultural acceptability – is extremely important for the 'utilisation' of food. The concept of the 'nutrition transition' is therefore of concern in current analyses of the food system, especially in developing countries. The nutrition transition refers to the increased consumption of fats, refined sugars and animal products in the diet as these become more readily available and more affordable, especially for low-income consumers (Drewnowski & Popkin 1997). Coupled with lifestyle changes from processes like urbanisation, these poor-quality diets are associated with rising rates of overweight, obesity

and diet-related chronic diseases, like heart disease, diabetes and some cancers, which are becoming more serious among the poor (Hawkes 2006: 2).

Given the importance of food systems and food security, the aim of this review is to systematically review the literature on food systems in South Africa so as to answer the following question:

What can the literature about food security outcomes over the past 15 years tell us about the food system in South Africa?

Five secondary questions then guided what information was extracted from the literature and included in the review. These are:

1. *Who is playing what role in the food value chain and what are the barriers to food security?*
2. *How can the food system be understood within the social, environmental and market context?*
3. *What is not working about the food system that is causing food insecurity?*
4. *Where are the gaps in our understanding of the food system?*
5. *What are the implications for decision makers?*

Methodology

The methodology of this review comprised two stages. The first stage included a systematic review of the literature on food system governance following a method adapted from Candel (2014). This involved a two-pronged approach.

Approach 1

The first approach was aimed at getting access to the relevant peer-reviewed literature. A Scopus database search for articles published from 1999–2014 was conducted for the following keywords in the Title, Abstract and Keywords, with the following results:

- the search for 'food system' and 'South Africa' yielded 20 hits
- the search for 'food security' and 'South Africa' yielded 322 hits.

Having reviewed the abstracts with reference to the criteria set out below, 171 articles were chosen to be included in the final database. As some key literature known to the author was not included in the Scopus search, a similar search was conducted using the Web of Science database, with the following results:

- the search for 'food systems' and 'South Africa' yielded 11 hits, with no additional papers to the Scopus search.
- the search for 'food security' and 'South Africa' search yielded 277 hits of which 115 were already in the Scopus database.

Having checked the remaining references for relevance, 38 articles were added to the database. The combined database of peer-reviewed literature eventually included 209 articles.

The final articles entered into the database were selected based on a reading of the abstracts looking at the following inclusion/exclusion criteria:

Inclusion criteria

Provide information for the following categories:

- Food availability
- Food access
- Food utilisation
- Governance
- Fisheries
- Threats to/opportunities in the food system
- Food security measurements and case studies

Exclusion criteria

- Commodity-specific articles unless they specifically answered the broader question.
- Articles pertaining to countries other than South Africa or where South Africa was not the main country of focus.

The selected articles were initially grouped into subheadings, availability, access, utilisation, fisheries, governance, threats/opportunities and food security measurements (see Appendix 1 for the full database of papers as categorised). These papers were analysed for consistency in results and, when necessary, the entire article was downloaded and read.

Approach 2

The second approach was to access the grey literature, which was achieved through a systematic search on Google for the following keywords:

'Food System' AND 'South Africa'

... AND 'rural'

... AND 'urban'

... AND 'trade'

... AND 'governance'

... AND 'market'

... AND 'nutrition'

... AND 'consumption'

... AND 'culture'

... AND 'gender'

... AND 'sovereignty'

... AND 'Traditional knowledge'

... AND 'climate change'

... AND 'environment'

... AND 'water'

... AND 'biodiversity'

... AND 'biofuels'

... AND 'fisheries'

Only the first four pages of hits were read and an article was selected only if it was a document and was deemed relevant to add to the information already gathered. These documents were referred to when they provided further information that was not available in the peer-reviewed literature and if they were relevant to the subcategories of the review that are set out below. WWF-SA and PLAAS were the two main organisations with extensive documents that were of relevance to the review.

The second stage of the review was based on an initial analysis of the papers that had been found. Due to the large amount of information available (a total of 209 papers), it was not possible to conduct a full systematic review of the entire South African food system, especially given the focus of the review questions. Based on the author's analysis of the database and her expert opinion, together with the review's secondary questions, it was concluded that there was a substantial amount of new publications focusing on three subcategories, which had not yet been sufficiently reviewed. The three subcategories were thus chosen to reflect what new knowledge there was regarding the South African food system and to identify where there were still gaps in knowledge. Only the literature pertaining to these subcategories was included in the final review.

The result was that the systematic review led to a literature review of the existing knowledge and gaps in the following subcategories:

1. Nutrition transition
2. The role of business in the food system
3. Threats to the South African food system and gaps in knowledge

It should also be noted that many of the studies used to inform the final review are based on case studies or refer to specific sites in South Africa. There are very few nationally relevant studies, therefore much of the evidence presented is extrapolated to provide a review of the South African food system as a whole. Due to the diverse nature of the topics and the available literature, it has also not always been possible to discuss the full methodology and quality of evidence of the studies as required in a Cochrane-style systematic review. However, as a quality control, the majority of the literature referred to has been through peer review.

Food security in South Africa: evidence of a 'nutrition transition'

There has been a marked increase in the number of peer-reviewed studies relating to food security and the food system in South Africa over the past 15 years. From an average of around five publications per year in the early 2000s, the number has increased to a total of 58 in 2013 with 24 already having been published halfway through 2014. This can possibly be attributed to the increase in interest in food security following the 2008 food price crisis that saw skyrocketing food prices followed by food-related riots in countries around the world. While South Africa is food secure at the national level with experiences of hunger having fallen since 2002, there is more flux into and out of hunger (Altman et al. 2009). At the household level there is worrying evidence in both urban and rural areas of a high prevalence of stunting, wasting and micronutrient deficiencies, especially among children, that is related to socio-economic factors (Drimie & McLachlan 2013; Aliber 2009).

In the early 2000s in South Africa there was still a dearth of data on food security (see Hendriks 2005), but since then a number of national surveys¹ and case studies have been conducted that shed light on the nutritional status of South Africans (Rose & Charlton 2002; Van Heerden & Schönfeldt 2004; Bourne et al. 2007; Aliber 2009; Labadarios et al. 2011; Iversen et al. 2011). However, as Labadarios et al. (2009) highlight, the findings from these datasets differ and so they called for a more food security-specific national survey. The SANHANES-1 (first South African National Health and Nutrition Examination Survey) survey

¹ These include the National Food Consumption Surveys (NFCS), FI and Vulnerability Information Management System (FIVIMS; regional study), General Household Survey (GHS), Income and Expenditure Survey (IES), Labour Force Survey (LFS), Community Surveys and the national HIV/AIDS surveys – see Labadarios et al. (2009) for a full discussion on these.

aimed to rectify this gap and provides a comprehensive snapshot of food security in South Africa.² A few key statistics from the survey include the following:

- overall 45.6% of the population was food secure
- the largest percentage of participants who experienced hunger were in urban informal (32.4%) and in rural formal (37.0%) localities
- by province, the prevalence of hunger was the lowest in the Western Cape (16.4%) and Gauteng (19.2%) with the Eastern Cape and Limpopo being the only two provinces with a hunger prevalence higher than 30.0%
- demographically, the black African race group had the highest prevalence of food insecurity (30.3%), followed by the Coloured population (13.1%)
- a large percentage (28.5%) of the Indian population was also at risk of hunger
- the majority (89.3%) of the white race group was food secure, which was significantly higher than the food security of all the other race groups (Shisana et al. 2014).

Data from 2002–2007 shows a general decrease in the experiences of hunger by households (Aliber 2009; Labadarios et al. 2011) for children, but rates of stunting, micronutrient deficiencies and hunger and food insecurity continue to be unacceptably high (Vorster 2010; Iversen et al. 2011; Kimani-Murage et al. 2010) with South Africa ranked 146th globally in the Global Nutrition Index (Rosenbloom et al. 2008). Individual case studies, especially in rural areas, highlight the difference in these trends both geographically and between households (Le Roy et al. 2000; Kruger et al. 2007; Oldewage-Theron et al. 2005; Oni et al. 2010; De Cock et al. 2013; Nawrotzki et al. 2014; Ndobo & Sekhampu 2013; Msaki & Hendriks 2014). Jacobs (2009) found that nationally 10.6% of adults and 12.2% of children were estimated to be sometimes or always hungry in the 2007 General Household Survey. A recent study in Limpopo province found similar results, where 52% of rural households considered themselves severely food insecure (De Cock et al. 2013). These statistics paint the picture of a national food system in flux in its ability to feed the South African population, and also points to large regional differences in the experience of hunger.

The data further indicate that South Africa is undergoing a ‘nutrition transition’ where stunting, wasting and undernutrition³ in young children is occurring alongside increasing levels of obesity and overweight in older children⁴ and adults (Kimani-Murage et al. 2010; McLachlan & Landman 2013; Shisana et al. 2014). The increase in obesity is raising health concerns about a concurrent increase in non-communicable diseases with the issue being most acute among black women (Shisana et al. 2014; McLachlan & Landman 2013; Micklesfield et al. 2013; Vorster & Kruger 2007; Mvo et al. 1999). Over 50% of women and 30% of men in the country are overweight or obese (Shisana et al. 2014; Puoane et al. 2002). This increase in overweight/obesity needs to be seen in the light of the steady increase in the per capita food supply of fat, protein and total calories in South Africa, while salt intake is also

² The first round of the SANHANES study was a cross-regional survey to provide baseline data for future longitudinal studies conducted from 2007. It was based on household questionnaires where all occupied households were eligible to participate. The survey applied a multi-stage disproportionate, stratified cluster sampling technique where a total of 1 000 census enumeration areas (EAs – spatial areas used to collect census data) were selected from a database of 86 000. A further 500 EAs were chosen based on South Africa’s socio-demographic profile and 20 visiting points were then randomly selected within each of these, giving an overall sample of 10 000 (see Shisana et al. 2014 for more information).

³ The SANHANES-1 survey found the prevalence of stunting in children 0–14 years of age was 15.4%, of severe stunting 3.8%, of wasting 2.9%, of severe wasting of 0.8% and of underweight and severe underweight 5.8% and 1.1% respectively (Shisana et al. 2014: 207)

⁴ Overall girls had significantly higher prevalence rates than boys for overweight and obesity across all ages (16.5% and 7.1% compared with 11.5% and 4.7% for girls and boys respectively) (Shisana et al. 2014: 18)

in excess of recommended levels (Igumbor et al. 2012; Hofman & Tollman 2013). Alongside this increase in obesity, micronutrient deficiencies continue to be problematic. Anaemia affects 22% of women in South Africa and the prevalence of iron deficiency and vitamin A deficiency (VAD) in women of reproductive age is 9.7% and 13.3% respectively (Shisana et al. 2014). In children under five years of age, at the national level VAD has a prevalence of 49.3% and 39.0% in males and females respectively, overall anaemia was present in 10.7% of children, although no children in the SANHANES-1 sample suffered from severe anaemia (Shisana et al. 2014).

These public health concerns are largely concerned with the food consumption patterns of South Africans who often do not have access to a healthy diet. Several South African studies have shown that the majority of low-income South Africans consume a limited range of foods consisting predominantly of starchy staples such as maize and bread with low intakes of fruit and vegetables (Schönfeldt et al. 2010; Oldewage-Theron & Kruger 2011; Shisana et al. 2014). Stunted growth rates are also higher for children living in rural areas and on commercial farms (Kimani-Murage et al. 2010). These statistics are attributed to these households having limited access to food and often not benefiting from national fortification programmes, which will be discussed in the next section.

An increasing reliance on buying food

Food affordability

McLachlan and Landman (2013) attribute some changing dietary patterns to urbanisation, the expansion of supermarkets and the availability of processed foods. In South Africa, the affordability of healthy food continues to be of concern (Jacobs 2009; Schönfeldt et al. 2013). Households in the lower-income groups (LSM 1–3) spend approximately 35% of their income on food (McLachlan & Landman 2013). These households are often the most severely affected by malnutrition, including over- and undernutrition. They are also from the population groups most vulnerable to food price increases (Schönfeldt et al. 2010). Rural households, as well as people living in informal urban settlements, also pay more for a basic food basket than people living in formal housing in cities (McLachlan & Landman 2013). A study in small towns in South Africa found that healthier versions of commonly consumed foods (e.g. wholewheat vs white bread) cost 10–60% more than the less-healthy options when compared on the basis of weight (Temple & Steyn 2011). However, a surprising finding from an analysis of the 2005/2006 Income and Expenditure survey showed that rural households spend a larger share of their food budget on grain products, fruits and vegetables and a lower share on meat than their counterparts in urban areas (Jacobs 2009). Tentatively, this has been attributed to land resources in former homeland areas being underutilised, thereby allowing for more space for livestock. A complementary hypothesis is that since rural households tend to be net suppliers of meat, much of this meat is marketed through informal abattoirs, making it cheaper to buy than purchasing it from towns (Altman et al. 2009)

In rural areas, the higher cost of food compared to urban areas is attributed to the following:

- transport costs, which include fuel and maintenance costs
- low or no volume discounts for rural outlets
- stock losses due to spoilage, breakage, products exceeding their expiry dates and stock theft

- loading costs, which entail casual labour associated with loading at the wholesale markets (NAMC 2009 in Ramabulana 2011: 106).

However, there continues to be an increasing reliance on food purchases in rural areas, which increases the rural poor's vulnerability to food insecurity by discouraging home production and at the same time making households more vulnerable to the economic shocks that cause food price increases (Hendriks 2005). A number of studies have emphasised this growing dependence on market purchases for procuring food in South Africa (Baiphethi & Jacobs 2009; D'Haese & Van Huylenbroeck 2005; Pereira et al. 2014; Schönfeldt et al. 2010).

Within a broader political economy of deagrarianisation, and high levels of poverty, the reliance of many poor households on social grants has been identified as a mechanism driving the purchasing of food (Pereira et al. 2014).⁵ This has enforced a reliance on local stores and supermarkets rather than on food production in rural areas, thereby undermining the ability of households to invest in household food production and reinforcing deagrarianisation trends (Thornton 2008; Pereira et al. 2014).

Since most of the local stores from which rural consumers purchase their food are run by locals or immigrants who often do not have easy access to transport to obtain fresh supplies on a regular basis and have little electricity for refrigerating stock, the foods that are supplied in these areas tend to be bulk, processed grains (maize meal, rice, flour) and other non-perishable foods like tinned goods, packet soups, oil, soft drinks and packets of crisps (Feeley et al. 2011; Pereira et al. 2014). While income is now allocated to buying food, less is spent on home cultivation in gardens or on plots, resulting in a limited supply of fresh fruit and vegetables to the detriment of the community's micronutrient intake (Pereira et al. 2014). Furthermore, since staples are often procured from small-scale, informal millers with no or limited access to fortification premixes, the availability of micronutrients in the final product is lower than for urban consumers (Kruger et al. 2008; Yusufali et al. 2012 in Schönfeldt et al. 2013). Aliber (2009) argues that, combined with the expansion of supermarket food chains into remote rural areas in South Africa (which is discussed below), the proliferation of cash together with the reduced capacity to engage in subsistence agriculture for self-provisioning has meant that poor rural households are increasingly exposed to hunger and malnutrition.

In contrast to these findings on trends towards poor quality diets, studies on indigenous and traditional food crops (ITFCs) in South Africa suggest that low-income South Africans may be moving back to ITFCs for health and cultural reasons (Bichard et al. 2005 in McLachlan & Landman 2013). The benefit of this renewed interest in cultivating indigenous crops and harvesting of wild species comes down to two key factors:

- The nutritional value of these crops, and indigenous leafy vegetables (ILVs)⁶ in particular, is often higher than that of exotic vegetables, and ILVs can be an important source of micronutrients like vitamins A and C and iron (Venter et al. 2000; Jansen van Rensburg et al. 2004; Mavengahama et al. 2013). Traditionally, these species also play a significant part in indigenous cuisine and cultures and have been harvested for generations (Shackleton 2003; Dovie et al. 2007; Mooketsi & Gestrung 2011).
- Traditional crops, especially root and tuber crops like the indigenous potato, are tolerant of marginal conditions (Allemann et al. 2004; Hart 2010; Ayodele et al. 2011;

⁵ However Aliber's (2009) analysis of the General Household Survey shows that in 2007, 51% of seriously hungry households were eligible for social grants that they did not receive.

⁶ The genera of common ILVs include: *Amaranthus*, *Bidens*, *Chenopodium*, *Cleome*, *Corchorus* and *Momordica* (Shackleton 2003).

Dweba & Mearns 2012). This characteristic makes them a useful strategy for adapting to environmental stressors such as climate change. The role of traditional crops in the formal food system will be an interesting trend to monitor over the coming years, especially to see whether it gets translated into a shift in urban food culture. However, it will need to deal with the rapidly diminishing knowledge of how to gather, grow, cook, preserve and store these plants (Dweba & Mearns 2012).

Market dynamics and dietary guidelines

Using an economic approach estimating the cost of recommended nutrient intake, Jacobs (2009) showed that only one in five households can afford to meet their dietary energy costs, with 85% of rural households unable to afford even 'below average dietary energy costs'. It has been calculated that an average household income of only \$2.24 is available to feed up to seven family members per day, which means that many South Africans have as little as \$0.32 per person per day to meet all their dietary requirements (Schönfeldt et al. 2010). Having limited income to spend on food inevitably leads to an inadequate food basket that is largely dependent on the price of food, which has increased substantially over recent years as food inflation was 10.3% between January 2011 and January 2012, with the price of white maize increasing by 90% (NAMC 2012). In July 2012, rural consumers paid \$2.00 more than urban consumers for the same food basket (NAMC 2012).⁷

Due to the openness of South Africa's market, international food price shocks (such as in 2007/08)⁸ are almost fully transmitted down to local wholesale and retail prices, making poor households extremely vulnerable to food price increases (Kirsten 2012). Following from both the 2002/03 and 2007/08 food price crises, there were no major policy responses or changes in policy direction to reflect the newfound recognition among politicians of the importance of domestic agriculture as a buffer to international market dynamics (Kirsten 2012). Rather, it has reinforced the country's reliance on 'second-class' policy interventions that deal directly with relieving the burden of food price inflation on poor households (such as welfare payments, school feeding schemes and food packages) (Kirsten 2012). While these interventions can act as a safety net for poor households, they do not fundamentally alter the ongoing inability of households to afford food.

In 2012, South Africa released new food-based dietary guidelines (see Table 1).

The most significant changes made to the revised guidelines from the 2004 guidelines are the addition of dairy as a food group in its own right and the removal of any reference to alcohol consumption (Schönfeldt et al. 2013). In order to determine the affordability of meeting the FBDGs, the ability of individuals to purchase the foods outlined in the diets recommended by the National Department of Health⁹ was determined by calculating the sum of the cost of the food items as purchased at a typical urban store from one of the largest retail groups in South Africa (Schönfeldt et al. 2013). The results from studies have shown that it is unlikely that low-income households in South Africa can maintain a healthy, balanced diet that adheres to

⁷ The food basket comprised maize meal (5 kg), white bread (1 loaf), brown bread (1 loaf), full-cream milk (1 litre), sunflower oil (750 ml), margarine (500 g), rice (2 kg), black tea (62.5 g) and white sugar (2.5 kg).

⁸ The United Nations High Level task force on the global food crisis identified a multitude of factors contributing to the increase in world food prices that continued into 2011. These ranged from rising energy prices and biofuel policies to the financial crisis, speculation in agricultural markets and environmental hazards associated with climate change (Watch 2011).

⁹ Together with the FBDGs, the Department of Health specified four diets for men and women – one 'low income' and one 'middle income' for each gender – that meet daily nutritional requirements.

national FBDGs and meet all their dietary needs on a daily basis (Temple & Steyn 2011; Schönfeldt et al. 2013).

Table 1: The revised South African food-based dietary guidelines (FBDGs)

Food-based dietary guidelines for South Africans (aged 6 years and older)

1. Enjoy a variety of food.
2. Make starchy food part of most meals.
3. Fish, chicken, lean meat or eggs can be eaten daily.
4. Eat plenty of vegetables and fruits every day.
5. Eat dry beans, split peas, lentils and soya regularly.
6. Have milk, maas (fermented milk) or yogurt every day.
7. Use salt and food high in salt sparingly.
8. Use fat sparingly; choose vegetable oils rather than hard fats.
9. Use sugar and food and drinks high in sugar sparingly.
10. Drink lots of clean, safe water.
11. Be active!

Source: Schönfeldt et al. (2013: 229)

As pointed out above, when only \$2.24 is available per household per day to feed all family members, meeting dietary guidelines becomes problematic and households start to substitute recommended foods, especially protein, with cheaper but less nutritious options, e.g. chicken feet and heads often substitute for a chicken breast with skin (Schönfeldt et al. 2013). While the study is based on an urban setting, it is projected that individuals from rural areas in South Africa will be even less equipped to adhere to these guidelines due to even more restricted funds and higher food prices (NAMC 2012). The reality is that instead of spending money on a diverse diet, feeding family members with large portions of maize meal porridge is the only option available to poor South Africans to facilitate satiety and alleviate hunger, but it does not address their nutritional needs (Schönfeldt et al. 2013).

Although it is mandatory that all commercial maize meal porridge in South Africa is fortified, consuming fortified porridge throughout the day (three 850 g servings) contributes to only 45.5% of the Recommended Dietary Allowance (RDA) for protein, 85% of the RDA for iron and 31.2% of the RDA for vitamin A (Schönfeldt et al. 2013). As well as the nutritional value of food, the bioavailability of micronutrients also needs to be considered. For example, the form of iron found in animal products is significantly more readily absorbed into the human body than the form of iron found in plant foods or fortification mixes (Schönfeldt & Hall 2012).

In addition to the nutritional impact that food affordability has on households, there are also cultural and emotional impacts associated with being unable to access the food one prefers. In the AFSUN study in Cape Town, results from interviews showed that 48% of the surveyed population ate foods that they did not want to eat or forego foods that they preferred (48.6%) due to a lack of resources (Battersby 2011). The affordability of food that makes a nutritional, healthy and culturally acceptable diet is therefore a major constraint for meeting the food security requirements of poor South Africans.

However, vulnerability to high prices is only one of the many causes of food insecurity in the country because even when people have access to healthy food that they can afford, they still do not buy it. The role of consumer preferences is discussed in the next section.

Consumer choice, marketing and nutrition regulation

The growing significance of 'fast food'

Recent case studies have shown that there is an increased consumption of 'fast food' in South Africa, defined as convenience foods obtained from takeaway vendors, and usually characterised as energy dense, low in micronutrients and fibre and high in simple sugars and salt (Feeley et al. 2009). In the formal fast-food sector, as of 2010 there were 8 661 fast-food outlets in South Africa, 4 991 of which were owned by fast-food chains, the remainder being independent outlets (Igumbor et al. 2012). Although there are considerably more street stalls/kiosks than fast-food outlets in South Africa, the number of transactions from fast-food chains has increased significantly over past decades (Igumbor et al. 2012). South African companies dominate the fast-food market as their establishment pre-dates the presence of foreign transnationals, for example, Nando's was established years before Yum! (which owns KFC) entered the market in 1994 and today, eight of the largest 10 food service companies are South African (Igumbor et al. 2012 and see Table 2). The dominance of this industry is starting to have an impact on the food consumption habits of South Africans.

Table 2: The 10 largest food service companies in South Africa

Largest food service companies	Location of headquarters	Share of the market	Examples of chain brands owned by company
Famous Brands Ltd	South Africa	20.0%	Wimpy, Debonairs Pizza
Yum Brands Inc	USA	15.6%	KFC
Nando's Group Holdings	South Africa	9.5%	Nandos
Spur Corp Ltd		3.9%	Spur Steak Ranches, Panarottis Pizza
McDonald's Corp	USA	2.8%	McDonalds
Golden Fried Chicken	South Africa	2.5%	Golden Fried Chicken
King Pie Holdings	South Africa	2.5%	King Pie
Taste Holdings	South Africa	1.5%	Scooters, Maxis, St Elmo's
Captain DoRego's Fast Foods & Fresh Fish	South Africa	1.4%	Captain DoRego's
Ocean Basket Group	South Africa	1.3%	Ocean Basket

Source: Igumbor et al. (2012; supplementary material); Euromonitor International (2011) (Available at: <http://www.euromonitor.com>)

A 2009 study of 655 teenage participants in the Birth to Twenty (Bt20) cohort in Soweto showed that they consumed an average of seven or more fast-food meals per week with the most popular items being hamburgers, kotas (a quarter-loaf of white bread, chips, processed cheese and any number of processed meats and sauces, which yields more than 50% of the daily energy requirement of an average 17-year-old (5 970 kJ)), fried chips and vetkoek (Feeley et al. 2009). A further study in the Agincourt region of Mpumalanga identified the most common items available for purchase in the area as fried chips, vetkoek and kotas with bread, polony, atchar (a pickle made with unripe green mangoes and chillies, prepared in oil),

chakalaka (a relish made with carrots, tomatoes, chillies and onions, prepared in oil), boiled eggs and fried fish also readily available (Feeley et al. 2011). The reasons vendors gave for having only a limited range of fast-food items were restricted resources, customer preferences and the difficulty they had in keeping food fresh as there was no refrigeration available (Feeley et al. 2011).

Feeley et al. (2011) hypothesise that these fast-food items will become a regular part of the local diet because healthier options are less accessible, and that the easy access to fast food will influence cooking practices: home cooking may become less frequent, with increasing dependence on fast food, especially where people have to travel long distances at high transport costs to larger villages to buy from formal vendors or trading centres. Other studies have corroborated the importance of food preferences. For example, there is evidence that, despite being more expensive, fried chicken is often substituted as a source of protein in lieu of cheaper, more nutritious sources of meat (Schönfeldt et al. 2010).

As well as the change in food consumption patterns that have been observed from the increase in the availability of fast food from vendors, there are also interesting trends in the availability of foods in supermarkets. Reardon et al. (2007: 407) refer to the diffusion of supermarkets by diversifying their formats and differentiating their 'consumer segments'. This diversification is not only spatial; it also extends to product type. The first wave of products to penetrate a market is characterised by processed foods like rice, noodles, oils, tinned foods, etc. followed by semi-processed food like dairy and meat, and finally fresh produce (Reardon et al. 2007). The limited penetration of fresh produce into supermarkets in lower-income areas has been attributed to the perceptions by customers that it is not as fresh or is lower in quality, or to a lack of refrigeration, which means that customers prefer to make smaller purchases of fresh produce more often (Humphrey 2007; Reardon et al. 2007; Strydom 2011 in Battersby & Peyton 2014). This means that residents in low-income areas with supermarkets first receive better access to high-calorie, nutritionally poor foods rather than to fresh produce (Temple & Steyn 2011). The role of supermarkets in facilitating access to affordable but nutritionally poor foods in low-income areas is hypothesised to accelerate the nutrition transition while not necessarily addressing food and nutrition insecurity (Battersby & Peyton 2014).

Marketing and advertising campaigns also have a significant impact on food choices. While there are few studies on this in South Africa, Igumbor et al. (2012) provide some interesting examples of how food producers link with retailers to promote their foods by running sales promotions, competitions and in particular through special packaging to appeal to certain target groups. For example, Albany bread (a Tiger Brands company) promotes the health aspects of its products with statements like: 'It's a great source of fibre, and fortified with vitamins and minerals, and it's cholesterol free' and make use of a 'Low GI' symbol while Nestlé claims 'Simple Goodness High in Fibre' on Maggi 2-minute noodle packets, and Rama margarine (a Unilever brand) is sold with the claim 'Rama is a vital energy source, highly fortified with 8 GoodStart™ Vitamins, making it a highly nutritious margarine and spread' (Igumbor et al. 2012: 5).

Added to the direct marketing on the products themselves, advertising is also extremely important. A study undertaken by Temple and Steyn (2008) reported that 16% of the advertisements during the 37.5 hours of children's TV programming they recorded were for food products, and that 55% of these were for foods of poor nutritional value such as refined breakfast cereals, sweets and drinks high in sugar. In an unpublished pilot survey, researchers identified eight food advertisements in seven hours of children's TV programming on the

national TV channel SABC1 – four for sweets, one for refined breakfast cereal, two for tea, and one for a milk product (unpublished data in Igumbor et al. 2012).

There is a clear need for greater understanding of the impact that marketing and advertising has on the food choices that people make. With individuals in rural and urban settings buying more and growing less of their food, building up an evidence base of how business practices influence consumer food preferences and therefore food security is critical in understanding the food system. At the same time, it is important to understand how government regulation has reacted to these changing consumption trends and how it acts to enable or constrain consumers to make informed decisions about their food consumption and health.

Government regulations

Dr Aaron Motsoaledi, the South African Minister of Health, recently observed that ‘... Africans are eating more and more junk processed foods instead of their traditional diet’, and in response to this trend, he has decided to regulate junk food starting with reducing salt in bread and eliminating trans fats (Igumbor et al. 2012: 5).

As well as the maize fortification regulations, the Department of Health has also implemented other regulations to try to reverse the negative impact that the diets of South Africans are starting to have on their health. The Regulations Relating to the Labelling and Advertising of Foodstuffs¹⁰ state that, while nutritional labelling remains voluntary unless a claim is made on the product, when labels are used, the regulations require a standard format for the nutritional label and statements such as ‘A source of’, ‘High in’, ‘Low in’, ‘Virtually free of’ or ‘Free of’ specific nutrients are only permitted if strict criteria are met (Igumbor et al. 2012). Manufacturers may no longer use descriptive words such as x% fat-free, nutritious, healthy, healthful, wholesome, complete nutrition or balanced nutrition (Igumbor et al. 2012). However, a new draft amendment is now available for comment, which will make labelling compulsory.¹¹

The Ministry of Health is also currently developing a salt reduction initiative that over a 10-year period will gradually reduce salt levels in several highly consumed products, including bread, gravies and spices, brine, chicken, cereal, margarine, and salty snacks (Igumbor et al. 2012). South Africans are estimated to consume double the WHO-recommended maximum of 5 mg per day, the major source of which comes from bread, which is a staple food (Hofman & Tollman 2013). It has been estimated that by decreasing the daily intake of salt by 0.85g per person could avert 7 400 cardiovascular deaths (2 900 from strokes), and save 4 300 lives from non-fatal stroke (Hofman & Tollman 2013).

The Department of Health has also limited the use of artificial trans fats to a maximum of 2% of oil or fat in all foods in its Regulations Relating to Trans Fats in Foodstuffs No. R. 127 published in 2011 (Igumbor et al. 2012). These regulations apply to all foodstuffs sold or manufactured in or imported into South Africa, as well as food prepared in restaurants, fast-food outlets, and the catering industry (Igumbor et al. 2012).

¹⁰ Regulations Relating to the Labelling and Advertising of Foodstuffs, No. R. 146 of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 came into effect on 1 March 2012. Available at: <http://www.gov.za/documents/download.php?f=213917>

¹¹ See <http://www.sabinetlaw.co.za/agriculture-forests-and-fisheries/articles/foodstuffs-labelling-and-advertising-regulations-amended>

Woolworths was reported to be the first retailer to have removed trans fats from their entire brand product range in 2007 while KFC South Africa stated that it had eliminated all trans fatty acids from its food products in August 2009 (Igumbor et al. 2012).

Business in the food system

The role business plays in the food system is a controversial topic, yet its importance both as an actor in the food system and a conduit through which broader market trends are translated domestically, needs to be emphasised. Some organisations like the World Economic Forum suggest that there are commercial opportunities for those businesses that find innovative ways to satisfy unmet needs in the food value chains of poor countries and that this could help mitigate food insecurity, but others like Oxfam are highly critical of business when it contrasts the corporate profits of multinational food companies with the hardships faced by poor people during the 2008 crisis (Hamann et al. 2011). In South Africa, discussing the role of business in the food system cannot be separated from the effects of rapid urbanisation, the concentration of ownership of food production and distribution, and the globalisation of the food trade, which have radically altered the South African food system as South Africa has become a net importer of various agricultural products and foods (Igumbor et al. 2012). At the same time, the South African food market is significant, estimated to be worth over R200 billion, with the fresh-produce sector commanding a 15% share (Chikazunga & Paradza 2012).

Urbanisation and supermarkets

More than 60% of South Africa's population now lives in urban areas¹² and with the rural population relying more on purchasing their food (D'Haese & Van Huylbroeck 2005), the role of formal and informal food retailers in providing access to food is becoming increasingly recognised. According to McLachlan and Landman (2013) there are approximately 33 hypermarkets (equal to 330 supermarkets) and 1 352 actual supermarkets, amounting to almost 1 700 supermarket equivalents in South Africa. These make up less than 2% of food retail outlets, yet have an estimated retail share of 50–60% (McLachlan & Landman 2013). Four major companies (all of which are South African) account for 97% of sales within the South African formal food retail sector with Shoprite Checkers currently controlling around 38% of the formal food retail market, followed by Pick n Pay at 31%, Spar with 20% and Woolworths with 8% (GAIN Report 2012 in Battersby & Peyton 2014).

Supermarkets are also expanding by opening stores in new formats (Battersby & Peyton 2014). The expansion can be attributed to the growing disposable income among African consumers, which has effectively opened new markets to the supermarkets and their subsidiaries (such as Boxer, owned by Pick n Pay, and Sentra, owned by Shoprite) (Battersby & Peyton 2014). For example, of the 225 new stores that Pick n Pay planned to open in 2012/2013, 119 would be Pick n Pay supermarkets and the rest would be Boxer Superstores, small-format and express stores (Magwaza 2013 in Battersby & Peyton 2014). Their new partnership with BP would see 120 new convenience stores opening at petrol stations to rival the 45 stores that Woolworths has in partnership with Engen (Mantshantsha 2013 in Battersby & Peyton 2014).

¹² World Bank data: Available at: <http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS>

The expansion and success of the convenience store model emphasise the time constraints of many urban consumers who no longer dedicate much time to buying and preparing food.

Supermarkets have thus become the major competitor for local small-scale agricultural and small and medium enterprise (SME) sales, displacing traditional food retailers such as small convenience stores, public markets and 'spazas' (small informal shops often run from homes) as the primary places from which South Africans purchase their food in both urban and rural areas (Igumbor et al. 2012). For example, a case study in the rural Ciskei region of the Eastern Cape found that 64.8% of households in villages purchased their food from supermarkets (D'Haese & Van Huylbroeck 2005). The expansion of supermarkets into lower-income areas has been made possible by the retail management and procurement models of these organisations, which have allowed them to out-compete local wholesalers and small retailers on cost and quality in most of their product offerings (Igumbor et al. 2012). The African Cooperative for Hawkers and Informal Business has stated that about 150 informal retail stores in Soweto, Johannesburg, have been forced out of business partly due to the entry of large retail chains into the township (Bissiker 2006 in Battersby 2011), but other evidence from Jabulani Mall in Soweto shows less conclusive results (McGaffin 2010 in Battersby 2011).

That being said, informal trading is still significant in South Africa, especially when it comes to accessibility. In 2000, South Africa had approximately 500 000 street traders with 350 000 selling food and it is estimated that this number has grown since then (Crush & Frayne 2010). In the eThekweni metropolitan area in KwaZulu-Natal there were about 20 000 traders who daily sold up to 28 tonnes of cooked mealies (Crush & Frayne 2010). At the same time, informal traders often source their own produce from supermarkets and wholesalers, like Boxer or Metro Cash & Carry (Pereira et al. 2014). Often, when purchasing from informal traders, the mark-up on processed food products is as high as 39%, which is attributed to transport and distribution costs and to maintaining profit margins, but may also reflect the monopoly position of local stores in poor communities (D'Haese & Van Huylbroeck 2005).

The importance of informal traders is more pronounced in the urban food context where the spatial legacy of apartheid situated the poorest households away from the wealthiest, meaning that low-income households are located further away from supermarkets (Battersby & Peyton 2014). A study by Battersby and Peyton (2014) on the distribution of supermarkets in Cape Town showed that at the city scale, supermarkets are clustered either in wealthy areas or around major roads and busy transport hubs. The latter tend to cater to low-income commuting workers and as such stock cheaper brands and appear to have limited fresh produce compared to stores that cater to the residents of wealthier areas (Battersby & Peyton 2014). So, while supermarkets in Cape Town are unequally distributed by income, households from poor areas do not necessarily buy food in their residential area but 'out-shop' by buying food during their commute to and from work (Battersby & Peyton 2014). Although these consumers gain more convenient access to food, their access to a diverse and healthy range of food is still limited, especially when compared to consumers from wealthy areas who have supermarkets that stock a diversity of fresh food, albeit at a higher price, conveniently located in their neighbourhoods (Battersby & Peyton 2014). Households with no commuting member must by necessity rely on informal traders and SMEs for access to food in areas where as yet there are no supermarkets – a phenomenon that is also playing out in rural areas (see Pereira et al. 2014). This dependence on purchasing food has therefore made the expansion of supermarkets a boon to many low-income households from a convenience and affordability perspective. However, supermarkets have also increased accessibility to highly processed, nutrient-poor food, which is often cheaper than fresh fruit and vegetables. It is in this complex

milieu of dependence on informal traders and 'Big Food'¹³ manufacturers and retailers that the nutrition transition must be contextualised in South Africa.

The nutritional implications of 'Big Food' dominance in the food system

While 'Big Food' manufacturers generally depend on formal retail chains to sell their products, recently their strategies to increase the availability of their products have involved the informal retail sector, which now sells soft drinks, dairy products, bakery products and snacks such as chips (crisps) in urban as well as rural areas (Chopra in Igumbor et al. 2012)). Coca-Cola, as part of their 1990s strategy to 'double soft-drink sales' developed incentives for people to set up informal outlets in the townships, such as providing trolleys, lighting boards, point-of-sale display materials and refrigeration equipment, and delivered the products directly to the store in order to make their products more widely available (Igumbor et al. 2012). By 2005, around 95% of spaza shops were selling Coca-Cola products and making a large proportion of their turnover from the sale of these products (Igumbor et al. 2012).

In a similar vein, although street food is purchased almost twice as often as fast food, fast-food chains have developed aggressive expansion strategies to make their products more available (Igumbor et al. 2012). For example, McDonald's stated that 'South Africa is one of the most successful markets in McDonald's international history: a record was set when South Africa opened 30 restaurants in just 23 months, at one stage opening 10 restaurants in 78 days' (Igumbor et al. 2012: 4).

There is still some debate as to the impact of 'Big Food' retailers on food security. On the one hand, as a result of their more effective procurement policies and better management, supermarkets benefit from economies of scale, thereby making food prices lower in supermarkets than in traditional retail outlets (D'Haese & Van Huylenbroeck 2005). It has been argued that this is beneficial to the poor as they get a wider variety of food at lower prices, while at the same time the quality and safety of food is ensured as supermarkets tend to follow more stringent quality requirements than their informal market counterparts (Ramabulana 2011). However, the industrial food system has also been blamed for replacing traditional, nutritious food with highly refined foods, low in fibre and high in fats (including trans fatty acids), sugar and salt (Wojcicki 2005 in McLachlan & Landman 2013). Supermarkets make both staple foods and the packaged foods produced by large manufacturers more affordable to local populations, providing them with easier access to these less healthy foods (Igumbor et al. 2012). Furthermore, the money spent in supermarkets contributes little to strengthening the local economy (D'Haese & Van Huylenbroeck 2005). In essence there is an internal contradiction regarding the role of supermarkets in aiding or constraining food security.

While healthier foods are more readily available in supermarkets than in small shops, these typically cost between 10% and 60% more in supermarkets than less healthy foods when compared on a weight basis, and between 30% and 110% more when compared on the cost of food energy (Igumbor et al. 2012). It is also interesting to note that, although this has not been studied extensively, a small study of imported highly processed products and locally produced equivalents (mainly from Tiger Brands) in the Shoprite, Pick n Pay and Spar supermarket chains suggests a complex picture: for all categories of processed food except breakfast cereals, the imported products were cheaper than the local equivalents in terms of average

¹³ 'Big Food' is defined as those 'large commercial entities that dominate the food and beverage environment' (Igumbor et al. 2012: 1).

cost per 100 g, but the price differentials varied widely. Imported instant meals cost on average R0.62 less per 100 g than locally produced products, whereas the price differential for salty snacks was R1.49 (unpublished data in Igumbor et al. 2012). Also, while the imported products appeared to be cheaper, their nutritional content appears to be better because domestically produced products tended to have a higher sodium and total and saturated fat content than the imported equivalents¹⁴ (unpublished data in Igumbor et al. 2012).

Refined cereals and foods with added sugar and fat are among the lowest-cost sources of energy in rural supermarkets, thus making nutrient-poor products such as biscuits, margarine and oil-heavy snacks a cheap yet varied source of energy in rural diets (Igumbor et al. 2012). There is increasing evidence that the increase in consumption of these unhealthy foods, especially those high in salt and sugar, has resulted in increased health risks from non-communicable diseases (Mayosi et al. 2009; Hofman & Tollman 2013; Tollman & Kahn 2007; Hofman 2014). However, in general, nutrient-dense foods such as lean meat, fish, fruit and vegetables cost far more than processed food products (Igumbor et al. 2012).

The role of supermarkets in facilitating consumers to choose affordable but nutritionally poor foods in low-income areas is hypothesised to accelerate the nutrition transition while not necessarily addressing food and nutrition insecurity (Battersby & Peyton 2014). With individuals in rural and urban settings buying more and growing less of their food, building up an evidence base of how business practices influence consumer food preferences and therefore food security is critical to understanding the food system. At the same time, what merchandise the supermarkets buy and where, how and from whom they source it affect the agricultural, manufacturing and processing sectors as well as the economy as a whole (Louw et al. 2007). The power over supply chains and the increasingly concentrated structure of the South African food system is further elaborated in the section below.

Trade and concentration

South Africa's agricultural sector was historically built on the basis of extensive support to white agriculture and an 'agricultural nomenclatura' or a caste of privileged individuals representing the interests of white commercial agriculture (Bayley 2000 in Greenberg 2013). While agricultural restructuring was well under way by the transition to democracy, the influence of this 'nomenclatura' shaped the trajectory of agrarian reform towards an emphasis on large-scale commercial production as the basis for food security (Greenberg 2013). The 1996 repeal of the 1968 Agricultural Marketing Act 59 of 1968 by the Marketing of Agricultural Products Act 47 of 1996 fundamentally changed the way business was conducted in the agricultural sector in South Africa as the marketing of agricultural products was now to occur in a deregulated and relatively free market subject only to minimal government intervention (Doyer et al. 2007). The end of the agricultural marketing boards meant that producers had to establish new institutional structures and arrangements to govern the marketing of food and fibre products, previously handled by the marketing boards (Vink & Kirsten 2000). Groenewald (2000) gives an extensive overview of the controversy surrounding the changes in agricultural policy that South Africa underwent:

¹⁴ It is interesting to note that over the past 15 years or so, there has been a marked increase in imports of processed products, for example, the value of imported 'Bread, Pastry, Cakes, Biscuits and Other Baker's Wares' increased from approximately R5 million (US\$714 000) in 1992 to almost R250 million (US\$36 million) in 2006. The importation of ingredients used in processed foods has also increased (Igumbor et al. 2012).

By the beginning of the 1990s, the Marketing Act had become as controversial as ever. [...] It was also said that the Marketing Act was there to further the interests of the white commercial farmers to the detriment of black farmers who were left out, and to the detriment of the consumers. The degree of monopolisation engendered and entrenched by the Marketing Act was a source of concern. [...] There were calls by some farmers to be allowed to market freely [...]. (Groenewald 2000: 394).

Deregulation in the agricultural sector had already begun in the 1980s in South Africa, but the worldwide deregulation effort that came with signing of the Marrakech Agreement in 1994 had a considerable impact on agricultural supply chains across the world (Doyer et al. 2007). Changes in South Africa's regulations were needed to comply with the World Trade Organization's (WTO) regulations signed in Marrakech, which called for the tariffication of all agricultural produce as opposed to quantitative measures, and a phased reduction in the tariffs (Doyer et al. 2007). South Africa reduced its tariffs at a faster rate than was required, negotiated new agreements with the Southern African Development Community (SADC) and the European Union (EU) and became a member of the Cairns Group, which supports the unilateral liberalisation of agricultural trade (Vink & Kirsten 2000). The net effect of these changes has been that the South African agricultural sector is increasingly exposed to the vagaries of international markets (Doyer et al. 2007). Hence the challenge to South African agribusiness was 'to achieve and maintain competitiveness in order to survive in the new competitive environment' (Doyer et al. 2007: 497).

Research conducted by Doyer et al. (2007) in 2001 showed that future-focused growth strategies of South African agribusinesses were mostly centred on market penetration (34% of respondents) and market development (36% of respondents). South African agribusinesses strategy was therefore to use current products to penetrate current and new markets with only 17% of managers preferring a product development strategy and 13% opting for a diversification strategy (Doyer et al. 2007). The result of the survey also clearly showed a significant trend towards cooperation and coordination in the South African agribusiness supply chain:

- 50% of agribusinesses indicated that they would implement their strategic direction in cooperation with other enterprises
- 41% said they would base the implementation on their own competencies
- 7% indicated that they would take over or merge with other companies
- 2% indicated other strategies for implementation (Doyer et al. 2007).

Although the study was conducted in 2001, when put in context with the historical legacy of commercial interests in the agricultural sector, it provides some explanation for the current structure and power relations in the South African food sector (see Box 1). These are concentrated not only within commodity chains but also upstream into the mining-energy-chemicals complex and downstream into non-food retailing (Greenberg 2010). Even in the animal feeds sector, three companies (Epol, Meadow Feeds, AFGRI) own 75% of the market share in South Africa (Bernstein 2013: 29). Rather than breaking down existing concentration,¹⁵ the new marketing laws meant that small-scale black farmers were unable to compete, except in some niches, because they had not received the assistance that had previously been afforded to the commercial sector before liberalisation (Greenberg 2013). At

¹⁵ In fact, data shows that there was not only concentration happening downstream in the food system, but also in land ownership of farms. According to the Census of Commercial Agriculture the 60 000 or so commercial white farms of 1994 had declined to 45 000 by 2002, which suggests a trend of concentration of landed property that accelerated in the first decade after the end of apartheid (Bernstein 2013).

the same time, these reforms exposed concentrated domestic industry to global competition where larger entities were able to compete or acquire local businesses, with the result that in practice an increase in concentration became the growth model (Greenberg 2013). In essence, South African agriculture and agricultural policy has done little to transform the circumstances of those dispossessed and marginalised under apartheid. Instead, production and accumulation by the minority have increased through growing concentration of both farming and agribusiness, technical change and the reduction of the farm labour force (Bernstein 2013).

Hence, the South African food sector, in line with similar trends in other emerging economies, has become increasingly concentrated (Hamann et al. 2011; Greenberg 2010). The Co-operatives Amendment Act of 1993 was a key piece of legislation permitting co-ops to convert into companies. This led to major mergers and acquisitions around the core of the former co-ops to form companies such as Pioneer Foods in 1997 through to Ceres in 2007 (Greenberg 2013). In the retail sector, as mentioned above, a few large supermarket chains control food sales, and in the food manufacturing sector a few large, publicly listed companies control both production and sales capacity in most food categories (Mather, 2005; Fig, 2007; Louw et al. 2007 in Hamann et al. 2011). These companies further control entire commodity chains, centralising their supply chains for maximum efficiency, which means that smaller farmers find it difficult to compete with established farms that can meet the requirements of the market created by these large companies (Louw et al. 2007; Greenberg 2010; Greenberg 2013). However, some case studies, such as the Spar Thohoyandou case study by Louw et al. (2007) highlighted that it is possible in some cases to create the necessary conditions for small-scale farmers to be integrated into formal supply chains and that businesses like supermarkets can serve to facilitate this process.

The largest 10 packaged-food companies in South Africa account for 51.8% of total packaged-food sales; half of these are South African companies, of which Tiger Brands has the largest share (see Table 2). Artisanal packaged processed foods (products sold at the site of production, commonly bakery products), contribute only 7.3% of total sales, which is still greater than the global average (Igumbor et al. 2012). The top 10 soft-drink companies account for 79% of the total soft-drink sales in South Africa with three companies – Coca-Cola Co., PepsiCo Inc., and Danone Groupe – accounting for 64.7% of the market between them, with the other top companies each contributing less than 3.5% (Igumbor et al. 2012). All three market leaders are major transnational companies, but are linked with South African companies; Coca-Cola is bottled by SABMiller, and PepsiCo is manufactured under licence by Pioneer Foods (Igumbor et al. 2012). What these data shows is that while the global trend of integration in the food sector is reflected in South Africa, the country maintains a dominant domestic food industry. These South African companies, such as Tiger Brands and Shoprite Checkers, are dominant in the region and could be said to be playing a similar role on the continent as transnational corporations like Unilever and Walmart play internationally (Pereira 2012). At the same time as South African companies are moving into Africa, global giants like Cargill and Monsanto are asserting their importance in South Africa – updated data and research are required in order to establish what the impact of the presence of these large non-consumer facing and trading companies will be on the South African and African food system. Given the controversy in the country around genetically modified crops, the role that these transnational companies play from both a social and environmental perspective needs to be interrogated more fully.

Since 1994, South African food retailers have expanded aggressively into Botswana, Namibia, Zimbabwe, Malawi, Mozambique, Kenya and African countries (Louw et al. 2007). The most

recent, but outdated, peer-reviewed data show that Shoprite, the largest retailer in Africa, has invested in over 13 African countries with plans to move into more and it aims to earn 50% of its revenue outside of South Africa (Weatherspoon & Reardon 2003). Pick n Pay, the next largest South African food retailer, has also expanded operations into Africa, but to a lesser extent than Shoprite (Weatherspoon & Reardon 2003). However, it follows a different strategy to Shoprite, preferring first to develop franchise stores in a similar model to Spar (Pereira 2012; Louw et al. 2007). If the continent follows the same trends as Latin America, it is likely that supermarkets and other formal food companies will soon dominate the food system with all the positive and negative repercussions for food and nutrition security discussed earlier (Weatherspoon & Reardon 2003).

Table 3: Packaged food company shares in South Africa, 2009

Rank	Company	Location of Company Headquarters	Contribution to Total Packaged Food sales (%)	Examples of Product Types
1	Tiger Brands Ltd	South Africa	17.2	Milling and baking, groceries, confectionery, beverages, value added meat products, fruit and vegetables, products for the food services sector
2	Unilever Group	UK/Netherlands	4.9	Spices, sauces, dressings, margarine, teas, syrup and food solutions
3	Parmalat Group	Italy	4.8	Dairy products including milk, yoghurt, ice cream and cheese, fruit juices
4	Nestle SA	Switzerland	4.6	Baby foods, drinks, breakfast cereals, chocolate, confectionery, coffee, dairy products, ice cream
5	Clover Ltd	South Africa	4.6	Dairy products, desserts, beverages such as fruit juices, nectars and ice teas
6	Dairybelle (Pty) Ltd	South Africa	4	Dairy products, fruit juices
7	Pioneer Food Group Ltd	South Africa	3.7	Baking aids, tea/coffee, breakfast cereals, biscuits, condiments, juices and acidic drinks, dried fruits, eggs
8	Cadbury Plc (bought by Kraft in 2011)	UK/US	2.8	Chocolate, candy, gum, biscuits, coffee, other grocery
9	AVI Ltd	South Africa	2.8	Coffee, tea, biscuits, potato chips, frozen fish and seafood products
10	PepsiCo Inc	US	2.4	Drinks, savoury snacks

Source: Derived from Euromonitor*, 2011 [17] In: Alexander et al 2011 [18]; company websites.
 *Euromonitor does not collect data on the informal sector (defined as sales that are not taxed).
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Source: Igumbor et al. (2012: 3)

With the increasingly concentrated nature of the food sector, food manufacturing and to a certain extent retail companies have become common targets of protest in South Africa, particularly where there have been adjudicated cases of collusion and price fixing (Hamann et al. 2011). In particular, civil society, represented by the Congress of South African Trade Unions (COSATU), has advocated for the introduction of a regulatory body that would control prices and exports of food and farm produce in a similar way as the abolished marketing boards did (Sibanyoni & Ndlangisa 2010 in Ramabulana 2011). Agribusiness, on the other hand, represented by the Agricultural Business Chamber (ABC), is clearly opposed to such an intervention, stating that if the market were to be regulated, competition would no longer exist and companies would not have the incentives to invest in technologies and provide consumers with better products and services (Ramabulana 2011). The debate has not yet been resolved, but the nature of these controversies is discussed in the sections that follow.

Competition and collusion

In contrast to the original belief that liberalisation of the food and agro-processing sector in 1996 would lead to increased competition and bring about benefits to consumers, the recent uncovering of cartels and exclusionary practices by the Competition Commission has shown that there is evidence of the opposite having taken place in some supply chains (Ramabulana 2011; Grimbeek & Lekezwa 2013). A number of food, agro-processing and forestry companies had to face the Competition Commission, including Tiger Brands, Lancewood, Clover, Parmalat, Nestlé, Woodlands Dairy, Milkwoods Dairy, Foodcorp and Senwes, Premier Foods, Pioneer Foods, Rooibos Tea Limited, the Grain Silo Industry, Rainbow Chickens, and various

other agricultural industry associations (Ramabulana 2011).

Box 1 sets out the details of the wheat supply chain and in particular the anti-competitive behaviour of the main milling companies in the early to mid-2000s. Interestingly, based on the financial performance of the two listed milling and baking companies it appears as if margins for multi-product operations, including flour, bread, maize meal and other products such as pasta and rice are on average even higher since the cartel ended in 2007 (Grimbeek & Lekezwa 2013). This could be attributed to different strategies with some firms focusing on their leading and differentiated brands over which they have some pricing power, and not on revenue growth, but it paints an interesting picture of the power large companies wield in this sector, even without resorting to illegal behaviour (Grimbeek & Lekezwa 2013).

Another case that Grimbeek & Lekezwa (2013) discuss is that of the poultry industry where the market is even more concentrated. The exit of Country Bird in 2007 from the Elite partnership, which restricted them to buying 90% of their parent stock from Elite's breeding farms, enabled Country Bird to successfully introduce a new bird (the Arbor Acres chicken breed) into the South African breeding market (Grimbeek & Lekezwa 2013). The findings of the study revealed that the new breed substantially increased rivalry at all levels of the value chain, with significant changes in the market shares of the erstwhile duopolists (Rainbow Farms and Astral), and apparently resulted in more competitive outcomes for consumers (Grimbeek & Lekezwa 2013).

Less concentration at the national level has coincided with strong growth in overall production and narrower margins (Grimbeek & Lekezwa 2013). Although concerns over an increase in imports has also been cited as a reason for decreasing margins, there is evidence that at least over the 2006–2010 period, imports remained constant at approximately 20% for the period while the poultry industry in South Africa remains protected by import duties (Grimbeek & Lekezwa 2013). There are also assertions that the chicken that is imported into South Africa is transported into neighbouring countries (Grimbeek & Lekezwa 2013). The evidence of collusion and anti-competitive behaviour by South African agribusiness has sparked controversial discussion about the extent to which companies should collaborate in the food sector. Research by Hamann et al. (2011) revealed that many of the business respondents in their study highlighted constraints to collaboration over relevant issues such as Black Economic Empowerment (BEE) initiatives in agriculture, due to fears of being seen to engage in anti-competitive practices. Even with regard to collaborating over issues of common environmental threats such as climate change, some companies are loath to engage in discussions with others for fear of being accused of collusion (Pereira 2012; Pereira & Ruysenaar 2012). However, a representative from the Competition Commission argued during an interview that, provided it is done in the public interest, there are legal avenues for collaboration between private sector organisations, but that such initiatives need to be proactively identified and announced as such to the authorities (Hamann et al. 2011: 589). This representative went on to say that fears about engaging in anti-competitive behaviour may well be unduly constraining beneficial communication between business actors and so there is a definite need for more transparent discussions as to what kind of collaboration is desirable in the context of competition law and how to enable it (Hamann et al. 2011).

Box 1: Wheat

The wheat-flour milling market in South Africa is highly concentrated. The largest four firms, Pioneer Foods, Premier Foods, Tiger Brands and Foodcorp, are all vertically integrated along the wheat-to-bread value chain and account for more than 90% of the national supply of wheat flour. According to the Competition Commission's case and the admissions of the firms themselves, they had held meetings and had had other contacts to fix prices and divide markets by allocating customers to each firm. There was also an exchange of information, which enabled each firm to monitor its market share monthly, by region, by product category and by pack size. This resulted in sizeable fines being handed out to the companies concerned, but it has done little to alter the inherently anti-competitive structure of the South African wheat-to-flour value chain.

The high levels of concentration observed in this market are the result of high barriers to entry and the vertically integrated nature of the major players in the wheat-to-flour value chain. It has been suggested that coordinated conduct in wheat milling may have contributed to the increase of barriers to entry, for example through the cartel members coordinating production output (i.e. not milling at full capacity) to ensure that there is sufficient excess capacity to deter new entrants. Another factor is that competitive outcomes may differ across the different flour customer segments. National supermarket and wholesale groups with significant buyer power may be better placed to play off flour suppliers against one another, thereby ensuring price competition between the major players, whereas regional independent wholesalers and retailers may be more subject to coordination between players and get less competitive outcomes.

The vertically integrated nature of the industry and customer allocation between wheat-milling firms may also have marginalised smaller players in downstream activities, such as independent local bakeries. Although the bread-baking industry in South Africa is characterised by low exogenous barriers to entry, the existence of the cartel in flour mitigated the ability of independent bakers to enter and expand within the industry. Independent bakeries have the potential to exert a significant competitive constraint on the major bakeries through aggressive pricing and offering an alternative choice to consumers within narrow geographic regions. These bakeries are dependent on the major firms for their supply of wheat flour. This makes them vulnerable to exclusionary anti-competitive strategies by their competitors who, due to vertical integration, are also their major suppliers. According to Mossel Bay Bakery, Pioneer Foods engaged in predatory price conduct, charging below cost for bread with the intention of eliminating Mossel Bay Bakery from the market. The Commission's investigation revealed that Pioneer Foods was dominant in several local markets and that from 2002 to 2004 and in 2007, Pioneer Foods had indeed priced their baked goods below cost. The Commission estimated in a recent study that there was an average overcharge of approximately 25% on both white and brown flour prices to independent bakeries and an average overcharge on cake flour sold in the wholesale channel of approximately 7% during the cartel period.

Furthermore, wheat milling in South Africa has different regional dynamics. In regions like the Western Cape and the western part of the Eastern Cape there has been a lack of competitive outcomes due to the dominance of one firm in these regions that has a market share in excess of 50%. This has implications for price setting in these regions as the dominant firm appears to be the price leader with the other firms following the prices set by this firm. In contrast, more competitive outcomes and pricing patterns were observed in Gauteng and surrounding regions due to the presence and location of more wheat mills in this area. Even after the cartel period, the dominance of these large companies remains explicit, especially in regions like the Western and Eastern Cape, which remain characterised by high levels of concentration and a lack of new entry at a sufficient scale to constrain the activities of the major firms. The lack of entry in these two provinces has allowed the incumbent firms to continue to achieve high margins and have consistent market shares over time. Except for the transition period immediately following the end of the cartel period, flour prices in the Western Cape have been higher than those in Gauteng, despite the fact that the Western Cape is a region of surplus wheat production. The Western Cape appears to have remained under conditions of unilateral market power.

Post-cartel, there have been new entrants in wheat milling, including Pro-Grain and Target Investments, both of which entered the KZN region, and Kromdraai Milling based in the Free State region. However, these new entrants have a very small production capacity compared to the top four companies and they have not succeeded in becoming national competitors. It is clear when observing the persistence of concentration in the national wheat-milling market that the entry of smaller firms has not been sufficient to achieve competitive outcomes for consumers on a national scale. The stalemate in wheat-flour markets in the Western and Eastern Cape suggests that market outcomes will only change if there is investment in millers of sufficient scale to challenge Pioneer Foods and other large players on the one hand, and independent bakeries that are likely to support new entrants at the milling level of the value chain on the other.

Source: Adapted from Grimbeek & Lekezwa (2013)

Finally, in light of the rising food prices referred to in the previous sections, the pricing policy of companies becomes a highly sensitive topic. Some companies have reported that they have managed to limit price increases through a variety of measures, including cutting profit margins, putting pressure on suppliers to keep their costs down, experimenting with alternative ingredients without sacrificing quality and even looking at cheaper packaging alternatives (Hamann et al. 2011). This is largely due to the reputations that are at stake in an environment of escalating prices where companies seek to bring shoppers into stores. Hamann et al. (2011: 584) quote a manufacturing company representative who argued that: 'The food prices are affecting us . . . We are seen as bad companies that are profiteering and contributing to the situation . . . This positions us negatively and we get a bad reputation. This has tangible aspects when the unions talk us down and put our name on billboards.'

The transparent sharing of information for the sake of reducing price volatility is probably one of the most controversial topics presently being debated in the food industry (Hamann et al. 2011). However, as a highly sensitive yet vitally important aspect of the food system, food pricing by companies will continue to need research and multi-stakeholder engagement in order to get a firm grasp of the best path forward.

Agrarian structure

Much of the previous sections focused on the food system beyond the farm gate, with very little emphasis on the reality of the 'agrarian structure' in the country. 'Agrarian structure' refers to the structure of ownership and the control of productive resources across the entire food value chain and is critical to understanding South Africa's food system. Fundamental to the character of the food system, not only in South Africa but in the entire southern African region, is a history of dispossession and migrant labour, in the context of a deliberate engineering of a 'dualistic' agrarian structure in the interests of mining, industrial and agricultural capital (Cousins & Scoones 2010; O'Laughlin et al. 2013). The disconnection between land and agricultural policies is central to understanding the trajectory of change in the food system. A particular challenge in the South African food system is that of land reform after the end of apartheid and the constituent elements of inequality in the food system that it seeks to address.

Land reform

The South African food system also faces looming socio-political challenges, the most prominent of which is land reform and the pressure to include smallholder farmers in the food value chain. The issue of land reform in South Africa stems from a need to rectify the injustices of colonial and apartheid land policies. The current policy has come under widespread criticism both for its slow pace and its apparent inability to contribute to poverty alleviation (Valente 2009). Since 1994 the redistribution of agricultural wealth to previously disadvantaged citizens has been pursued through the liberalisation and deregulation agenda,

outlined in the previous section, which has resulted in increased efficiency through vertical integration, and elaborate value chains at the expense of addressing the needs of the poor and the landless (Hall 2009 in McLachlan & Landman 2013: 860). While some say that this system has contributed towards keeping food prices affordable, it has also constrained the entrance of new farmers and entrepreneurs into the system along the entire food value chain and has done little to redistribute agricultural wealth (Hall 2009; Satgar 2011 in McLachlan & Landman 2013).

The land reform debate fits into a larger debate about the need for agrarian reform in the country that will include marginalised farmers and communities in the country's food system. There are high barriers to entry for small farmers, manufacturers and retail outlets to be a part of the increasingly competitive and commercial formal food system in South Africa. Gaining entry is all the more problematic given the government's Black Economic Empowerment (BEE) policies that are meant to increase black people's participation in the formal economy, and the ongoing challenges experienced in the government's land reform programme (Hamann et al. 2011). In essence, the old agrarian and land system have largely been left in place, which has become an issue of great concern for many stakeholders. The uncertainty of policies is worrying the private sector, while the lack of progress is impacting on local communities and a cause of concern to civil society movements (Pereira 2012).

In South Africa, only 13% of the land is arable with only 3% of the arable land considered as high-potential land (Laker 2005 in Carter & Gulati 2014). As of 2012, figures show that 87% of arable land in the country was still owned by white commercial farmers (Van der Elst 2012). This is indicative of South Africa's dualistic agrarian structure that comprises about 35 000 large-scale, mostly white commercial farmers who produce much of the country's marketed output, and a much larger number (approximately 4 million) of small-scale, black farmers who are largely confined to the former Bantustans (Aliber & Cousins 2013). Those who have been beneficiaries of the land reform process are having difficulty developing or maintaining effective production on the newly acquired land, and they receive only limited government support, which has led many commentators to raise concerns about the implications for food security (Hamann et al. 2011; Greenberg 2010; Kepe & Tessaro 2014). On the other hand, there are still countless South Africans waiting to be beneficiaries of the system (Valente 2009; Van der Elst 2012; Greenberg 2013). Despite the rhetoric favouring small-scale agriculture, neither the land-reform programme nor agricultural restructuring processes since the end of apartheid have actually facilitated the realisation of this objective (Greenberg 2013). Instead, the government has been accused of pandering to agribusiness by pushing a contract farming model to integrate selected small-scale black farmers into corporate value chains, which has left the fundamental corporate-driven agrarian and agri-food structure intact (Greenberg 2013).

The primary critique of the land-reform process is thus that it has been largely tokenistic, with the incorporation of a few select black farmers into formal value chains being overshadowed by the ongoing consolidation of agribusiness

throughout the system. Examples include the recent Pioneer-Pannar and Walmart-Massmart acquisitions (Greenberg 2013). In fact, far from being challenged, the liberalisation agenda has effectively priced not only smallholder producers but also informal traders out of business (Jacobs 2008 in Tsheola 2014). In response to this, some have argued for policies and development programmes that can support small-scale farmers and the SME sector in accessing the market (D'Haese & Van Huylenbroeck 2005; Chikazunga & Paradza 2012), which is becoming a policy priority in the country (Tsheola 2014). Several of the larger supermarket chains have made attempts to procure produce from small-scale farmers, but the potential of such procurement is constrained by the challenges for these farmers to maintain quality and consistent supply (Chikazunga & Paradza 2012). Specific challenges include requirements for particular production standards, such as organic farming certificates, food quality and safety regulations and packaging criteria (Baiphethi & Jacobs 2009).

The traditional market of smallholders, namely informal traders, is also diminishing as small traders are beginning to source a larger proportion of their supplies from commercial producers (Baiphethi & Jacobs 2009). The benefit to rural smallholders of selling produce to informal traders is that they allow for one-off transactions that supermarkets do not engage in because these transactions increase transaction costs (Tsheola 2014). Under current trends, where the market is being increasingly formalised, rural smallholders are irrevocably losing their traditional markets and thus their ability to take part in the market (Tsheola 2014).

Fundamentally, the issue of land and agrarian reform is a governance issue in the South Africa food system that requires serious attention. In order to counter the dominance of agribusiness in the discussions, some civil society groups have proposed an orientation towards food sovereignty as a means of shifting power within the food system from corporate interests to community interests, thereby letting marginalised groups have a say in the governance of the food system (Wesso 2009; Groenmeyer 2013). This multi-stakeholder engagement and diversity of views are critical if the South African food system is to be adaptable to the various threats it faces (Pereira & Ruysenaar 2012). At the same time, it must be understood that the concerns of all parties, including business, need to be taken seriously and engaged with openly and transparently. The role of academia as a trans-disciplinary facilitator and knowledge broker is equally crucial in building a resilient food system (Drimie & McLachlan 2013). There is significant work that needs to be done now in synthesising the needs of various stakeholders and bringing the various points of views together in order to chart a way forward for the food system, especially with regard to the contentious issue of land and access to markets.

Responsible business practice

While there is a lot of negative literature on the impact of big business on food security, there is also evidence that business is responding to some of the criticism it has received. There is arguably a scale along which 'responsible

business practices' can be delineated. In the South African food sector, companies are engaging in a range of activities from increased social responsibility initiatives, taking voluntary action like product labelling, through to fundamentally altering corporate strategy in line with shifting governance trends like the King Code of Corporate Governance (King III) (IoD 2009). These will be briefly discussed below. There is growing literature on work in this area which, while not all available in published peer-reviewed journal articles and so not appearing in this review, is worth keeping track of (see for example Bland & Hamann 2015; Hamann et al. 2015).

All the major food manufacturers and retailers in South Africa have active Corporate Social and Environmental Responsibility (CSER) programmes, with the retailers Shoprite, Pick n Pay, Spar and Woolworths having more active examples than food manufacturers (Igumbor et al. 2012). While the focus of these programmes varies, there is often an emphasis on nutrition education even though fast food chains tend to focus more on sponsoring local sports teams and sports tournaments. A good example is McDonald's that was an official sponsor of the FIFA World Cup, which prompted much criticism (Igumbor et al. 2012). Linked to their social awareness campaigns, several big companies, including Tiger Brands, Coca-Cola and Spar, have voluntarily put Guideline Daily Amount (GDA) labels on their products to indicate the quantity of specific nutrients present in the food and what percentage it forms of the Daily Recommended Allowance (RDA) (Igumbor et al. 2012). Other companies are also involved in initiatives that support feeding schemes and vegetable gardens, some of which are linked to schools (Hamann et al. 2011).

While there has also been an international debate on the impact that marketing has on people's food purchase decisions, there is general agreement that marketing to children needs to be regulated. In South Africa there are draft guidelines restricting advertising to children under the age of 16 that were put on hold pending the World Health Organization's expected guidelines to be released in 2010 (Igumbor et al. 2012). However, some companies have taken voluntary action and in 2009, as an initiative of the Consumer Goods Council of South Africa, the South African Pledge on Marketing to Children was established (Igumbor et al. 2012). The pledge is similar to pledges made overseas, but covers only advertising on TV and in schools to children under 12 (Igumbor et al. 2012). It has 24 signatories, including food manufacturers, retailers and fast-food chains, but companies do not appear to have made specific commitments to the pledge, and no monitoring report has yet been released (Igumbor et al. 2012).

Large food-processing and manufacturing companies have also started taking voluntary action when it comes to improving the nutritional composition of their foods. An example is Unilever South Africa, which states:

We are committed to improving the fat composition of our products by reducing saturated fat as much as possible and increasing levels of essential fats. All of our Flora margarine and our Rama Original and Spread for Bread tubs already contain less than 33% saturated fat as a proportion of total fat. (Quoted in Igumbor et al. 2012: 6).

A large number of companies have also started supporting the development of food banks¹⁶ as a contribution towards improving food security. According to Hamann et al. (2011) the aim of these food banks is to redirect food that would otherwise be wasted or recycled in order to give poor people better access to adequate nutrition. Warshawsky (2011) provides an interesting analysis of the American food bank model that has been incorporated in Johannesburg as Food Bank SA. He discusses the positives of such a venture, such as an expansion and streamlining of the institutions that deal with food security, especially among bigger actors (Warshawsky 2011). However, he also highlights concerns about how this top-down approach can delegitimise and exclude alternative food security interventions and allow government to shirk responsibility to the hungry. He questions whether the reliance of the food bank model on business inefficiencies (overproduction and incorrect packaging) is the most appropriate way to deal with food insecurity (Warshawsky 2011). He also brings to the fore the ability of civil society organisations to adequately deal with the inequalities in access to food, showing that in Johannesburg, food security organisations are spatially polarised having the least presence in poorer, black areas where levels of food security are highest (Warshawsky 2013). There is thus much work that needs to be done in coordinating the various food security interventions under way in the South African food system, most notably to encourage coordination and communication between civil society, business and government (Pereira & Ruysenaar 2012).

Shifting corporate strategies: food security and sustainability

There have also been interesting Corporate Social and Environmental Responsibility (CSER) initiatives relating to sustainability and the environment by South African retailers (Pereira 2013; Pereira et al. 2013). For example, Woolworths' Farming for the Future initiative works with farmers to be more environmentally sustainable in their practices without going fully organic, and their EduPlant programme builds capacity in small-scale farmers (Pereira 2013). Many of these initiatives have been implemented in response to perceived threats to the food system and so can be considered as shifts in business strategy rather than CSER initiatives (Pereira & Ruysenaar 2012).

Some companies have come to view food security as a business opportunity, employing concepts such as 'the base of the pyramid' to suggest that innovation in products, processes or even business models can help to give the poor better access to better nutrition (Hamann et al. 2011: 586).

Various interventions have been recorded that fit this market approach to food security; from an international manufacturing company's programme to develop food products with high nutritional quality targeted at low-income consumers to a retail company explaining that they had begun to offer smaller pack sizes as they realised that some people could not afford the extra-large packs (Hamann et al. 2011). Pereira (2013) gives the example of Morvite, a sorghum-based nutritional food developed by Tiger Brands initially aimed at miners, that has

¹⁶ See <http://www.foodbank.org.za>

become a popular product among many low-income consumers because of its low cost, its nutritional value and variety of flavours. What is more, although this was not originally the intent of the company, having a sorghum rather than maize or wheat base, the product is also more adaptable to the projected impacts of climate change on agriculture in the country (Pereira 2013).

Furthermore, as discussed above, there are a variety of actions by the private sector that can be seen as both contributing to food security as well as detracting from it. The expansion of wholesale and retail companies into low-income areas, while opening up new markets to the companies, has also been marketed as a chance to enhance the access of poor residents to cheaper products. However, some companies have reflected on the potentially negative impact on the existing local supply (e.g. informal traders) if they were to move in rapidly, which is also informed by the need to create legitimacy in these areas (Hamann et al. 2011). A certain retailer operates a franchise model in some rural areas in order to include local ownership and there are ongoing efforts by a wholesale company to develop a network of small independent retailers in low-income areas, recognising that their presence contributes positively to the local economy (Hamann et al. 2011). The recognition by large companies that it is important to consider the local economy and their impact on small businesses is a progressive step in corporate strategy.

Skills development

In response to the looming threat of agrarian reform in the country, which will be discussed below, some companies also support training programmes for entrepreneurs, especially for farmers who want to access retail markets (Hamann et al. 2011; Pereira 2012). By providing these farmers with skills (from improved agricultural practices to packaging), committing to buying products from them or linking them up with larger commercial farmers who can share their storage and distribution facilities, these companies are pre-empting national pressure to include small-scale farmers in formal value chains (Hamann et al. 2011; Pereira 2012). The modification of procurement policies to allow for small-scale farmers and agribusinesses to be incorporated into formal value chains has been strongly advocated (Louw et al. 2008; Ramabulana 2011). There is now evidence that the private sector has started to take note and has begun to make its supply chains more inclusive. Whether this will be sufficient and timely enough to stem large-scale government intervention in this sector will remain to be seen, but it is an issue of concern for the private sector.

Challenges and gaps

Water scarcity and climate change

While the South African food system faces a range of threats, from biophysical changes through to issues of governance, it is not within the scope of this review to give an in-depth outline of them all. The biophysical threats to agriculture have in general been well documented. These include insufficient soil nitrogen constraining crop yields (Bloem et al. 2009) and the country's high inter-annual variability of rainfall, which determines year-on-year variation in crop yields (Lumsden & Schulze 2007). Access to sufficient water on an annual basis can also be quite a significant challenge for farmers, who are often hit by severe drought periods (Magombeyi & Taigbenu 2014). As a means to be more resilient to droughts, much emphasis has been placed on investing in irrigation schemes to help poor farmers to grow more and thus be able to avoid food insecurity and perhaps even earn an income from their produce (Kamara & Sally 2003; Hope et al. 2008; Oni et al. 2011; Sinyolo et al. 2014a; Sinyolo et al. 2014b). Other new solutions for water management in the food system include rainwater harvesting, which has been proposed as one solution to South Africa's food insecurity challenge (Mwenge Kahinda & Taigbenu 2011; Andersson et al. 2013). Novel strategies for increasing soil nitrogen by farmers with limited resources to buy fertiliser have also been employed, such as the use of leaf litter biomass from agroforestry (Murovhi & Materechera 2013) and using urine as an organic fertiliser (Okem et al. 2013).

The pressing stress of climate change has also been studied in terms of its potential impact on crop yields (Archer et al. 2007; Walker & Schulze 2006; Dube et al. 2013; Calzadilla et al. 2014; Johnston et al. 2012). The South African Citrus Growers' Association has voiced concerns that a volatile climate and the increased frequency and intensity of extreme weather events are among the top five factors shaping the citrus industry in the next five to 10 years as they could lead to volatility in supply patterns, volatile prices and have a negative impact on quality (Chadwick 2012 in Carter & Gulati 2014). Carter & Gulati (2014) provide a synthesis of the projected impacts of climate change on agriculture by referring to the Food-Energy-Water Nexus. In essence, the nexus argument is that, due to the interconnectedness of each system, demand for one resource can drive demand for another while at the same time the cost of one resource has an impact on the production efficiency of the others (Gulati et al. 2013). This interconnectivity is highlighted in climate change mitigation and adaptation strategies. For example, the mitigation of climate change through carbon sequestration, the expansion of biofuels or hydropower can create significant new water demands while adaptation through implementing irrigation schemes requires more energy than rain-fed agriculture (Carter & Gulati 2014). While the food-energy link is important, in terms of climate change impacts in South Africa the emphasis is on the linkages between the food and water systems.

Such impacts are especially concerning for South Africa, where the availability of natural water resources, which is a current constraint on production, is unevenly

distributed across the country, with more than 60% of the surface flows arising from only 20% of the land area (Basson et al. 1997 in Carter & Gulati 2014). Furthermore, the agricultural sector consumes 60% of the total water resource in the country despite only about 10% of farms having irrigation (Benhin 2006). Any increase in irrigation for growing food would thus have a significant impact on the water and energy systems. The biggest projected impacts of climate change on agriculture will be in the change of rainfall intensity and distribution, an increase in extreme events like droughts and floods and temperatures exceeding the natural tolerance levels of crops. Downscaled climate models suggest higher precipitation in the east of the country, a shorter winter season in the southwest and less rain in the far west (Hewitson et al. 2005). Projections by the UK Met office (2011) suggest as much as a 20% decrease in the far west and overall projects a general decrease in rainfall (Carter & Gulati 2014).

The resulting impacts of these climatic changes on agricultural production have been modelled for some key crops in the country. There is still no consensus as to the projected impacts on total production due to various assumptions about the amount of land that will be planted in future and the actual impact of the CO₂ fertilisation effect on increasing yields (see Carter & Gulati 2014 at 9 for an in-depth discussion on the impacts of climate change on wheat and maize and at 10 for the impacts on potatoes). In general, though, there is largely a negative impact on key cereal crops, including maize in the summer rainfall area and wheat in the winter rainfall area, with no substantive losses in the sugarcane industry (Ziervogel et al. 2014). The financial losses from maize production have been estimated in one case study to vary between R46 million with the CO₂ fertilisation effect, and R681 million without the CO₂ fertilisation effect (Turpie et al. 2002). Although confidence in the measurements for other crops is limited due to the small number of studies, these show that yields could potentially increase for rice and groundnuts (Carter & Gulati 2014). Rain-fed groundnut production in particular is likely to increase, which is interesting from a protein food security perspective because groundnuts are currently a relatively minor crop in the country despite being nutritionally rich (Dube et al. 2013). There will also be negative impacts on livestock farming in terms of greater water requirements for livestock and livestock heat stress (Archer & Tadross 2009).

Adaptation to climate change

Many farmers are interested in climate change findings and have started deploying various adaptation methods in response to their experience of historical changes in climate, which can be seen at multiple levels and mostly comprise adjustments in farming operations (Carter & Gulati 2014; Ziervogel et al. 2014). Irrigation appears to be the most popular intervention, which reinforces that water is the most important factor limiting agriculture in South Africa (Benhin 2006).

Most adaptation strategies refer to the processes that happen on the farm. Some common ones include planting different crops or crop varieties and at different times in the year, increasing chemical application to slow down evapotranspiration, increasing irrigation and shifts from flood irrigation to

sprinkler irrigation, providing shelter and shade for crops, increasing the use of modern machinery to take advantage of the shorter planting period, planting trees, and using soil conservation practices (Carter & Gulati 2014). In the Western Cape, apple orchards have been replaced by more high-temperature tolerant vineyards; while in the southern Cape commercial farmers have changed from crops to pasture and have increased their water-storage capacities (Ziervogel et al. 2014). In the case of livestock, farmers have adopted practices aimed at the more efficient use of water and producing their own fodder, such as lucerne or maize, and stocking it for use during the long dry seasons when fodder is scarce (Carter & Gulati 2014). Farmers are also switching to more heat-tolerant breeds and changing the timing, duration and location of grazing (Benhin 2006).

However, there are many socio-economic constraints on the capacity of farmers to adapt, such as the access to credit, which means that a more holistic approach is needed that takes into account social and financial as well as environmental capital to ensure that South African farmers can adapt to climate change impacts in agriculture (Misselhorn 2009; Bryan et al. 2009). The need for climate information to be disseminated to stakeholders in a usable way for adaptation processes to take place is also vital and has been extensively discussed in the literature (Bharwani et al. 2005; Vogel & O'Brien 2006; Bryan et al. 2009; Ziervogel & Ericksen 2010; Ziervogel & Frayne 2011). An interesting finding, however, is that stakeholders are more concerned about the uncertainty regarding organisational and institutional issues than uncertainties in modelling results themselves. This further advocates the need to engage with climate change adaptation across sectors in a participatory fashion (Ziervogel et al. 2014).

A big gap in the climate change adaptation literature concerns the impact of climate change on the food system beyond the farm gate. There are hardly any studies that go into a deep analysis of climate change adaptation using a systems or value chain approach. Although there are a handful of studies that look at the response of retailers to the threat of climate change, very few deal with the whole value chain and the private sector's adaptation strategies in general (Pereira 2013; Pereira 2012). This is a gap in the research that requires urgent attention.

Fisheries

Fisheries and aquaculture are regarded as part of the solution to global food security. Billions of consumers derive affordable, high-quality protein from this sector and it also provides a source of employment and livelihood to millions of people (FAO 2010 in WWF 2011). In South Africa, fisheries play an important economic role and provide direct subsistence to local communities. At the local level, fish provides a crucial source of protein for many of the traditional fishing communities along the South African coastline, many of whom are food insecure and depend on marine resources such as the snoek industry on the West Coast (WWF 2011; Isaacs 2013). At the national level, commercial fisheries contribute about 0.5% to South Africa's GDP (WWF 2011). In 2008, the annual revenue

from commercial fisheries exports from South Africa was estimated at R3.1 billion and the industry employed approximately 27 000 people directly, while 100 000 people were employed in fishery-related enterprises (WWF 2011). The squid fishery industry in the Eastern Cape, an impoverished region of South Africa, generated R500 million in foreign revenue annually, making it one of the country's most valuable fisheries (WWF 2011). However, the sustainability of the fishing industry is in question as it faces serious threats from the over-exploitation of marine natural resources.

Trends for marine harvests indicate a decline in fish stocks from 1972 for most countries in the southern African region, with increasing fishing pressures coming from an increase in demand due to local population increases, higher consumption rates, emergent export markets and tourism (Sherman 2003 in WWF 2011). Almost 50% of South Africa's marine resources are fully exploited, a further 15% are overexploited, including important commercial species such as West Coast rock lobster and Indian Ocean yellowfin tuna populations, and some of the most popular seafood choices of South Africans include species that are classified as collapsed, such as kob/kabeljou and geelbek (see Box 2). What is even more concerning is the lack of data on the current stock status for many species, including the majority of South Africa's linefish species, while existing stock assessments for other species are considered outdated (WWF 2011). Although there is general consensus that Africa's marine resources are declining, the lack of adequate data makes it problematic to institute effective governance mechanisms in this sector despite the important role that fishing plays in the South African food security.

At present South Africa has about 147 fishing communities, 28 338 fisher households and about 29 233 people who are considered true subsistence fishers. It is estimated that fisheries play a critical role in providing direct and indirect livelihoods for over 140 000 people in South Africa (DAFF 2010 in WWF 2011). The health and well-being of South Africa's fishing communities is therefore directly linked to the health of their fishery resources. This fact emphasises the importance of ensuring that these resources are sustainably managed to ensure job and food security for these communities (WWF 2011).

Considering the important role that fisheries play in food security and livelihoods in the country, the governance of fisheries is an important part of the governance of South Africa's food system. Much has been written in this area, with a general emphasis on the need for policy to take into account subsistence and small-scale fishermen – both marine and inland (Harris et al. 2002; Weyl et al. 2007; Hara & Backeberg 2014). Sowman (2006) provides an overview of the key problems in the sector, emphasising the lack of a clear policy that recognises the contribution subsistence fishing makes to food security. These findings are supported by case study evidence of a Cape Town fishing community that operates a snoek fishery through a community supply chain and informal markets (Isaacs 2013).

The Department of Agriculture, Forestry and Fisheries (DAFF) recently issued rights in an attempt to ensure that more of South Africa's marine resources

benefit South African rather than foreign fishers (Kimakwa 2009 in WWF 2011). It remains to be seen how effective these new regulations will be to ensure more equitable sharing of benefits in this industry. Furthermore, the predicted growth of the aquaculture industry in the region will also require that the lessons learnt globally about sustainable and responsible aquaculture are applied to new aquaculture ventures in southern Africa (WWF 2011). The increase in eco-labels and other certification devices could have a positive impact on both the environmental and financial sustainability of the fishing sector. WWF (2011) argues that eco-labels are one way to enter new markets or create niche markets that are more likely to withstand economic changes. They offer the example of the offshore and inshore hake trawl fishery, which is the only South African fishery certified by the Marine Stewardship Council (MSC) that recently withstood the global economic crises in contrast to the hake long-line industry, which suffered due to a collapse in their primary market in Spain (WWF 2011).

Despite the important role that fisheries play in the broader South African food system, there is little to no literature bridging the gap between the work on fisheries and the marine environment and that on land-based agro-food systems. This is a big gap in knowledge and there is definitely scope for more research to combine these bodies of knowledge in order to inform a more holistic approach to the South African food system.

Box 2: Status of South African commercial linefish and marine resources

Commercial linefish

- **68% – Collapsed**
1991: Red steenbras
1992: Dageraad, Roman
1993: White steenbras
1997: Dusky kob
1999: Silver kob, Geelbek, Red stumpnose, Carpenter
2005: Scotsman, Englishman
2006: Seventy-four
- **11% – Overexploited**
1996: Elf/shad
1998: Yellowbelly Rockcod
2007: Smoothhound shark
- **5% – Under review**
White stumpnose
- **16% – Optimally exploited**
1999: Snoek
2001: Yellowtail
2007: Soupfin shark

Marine resources

- **29.6% – Status uncertain**
Agulhas sole; Cape horse mackerel; Patagonian toothfish; white mussel; South Atlantic swordfish; Indian Ocean albacore; Indian Ocean skipjack; Atlantic yellowfin tuna
- **7.4% – Underexploited**
Round herring; seaweeds.
- **48.1% – Optimally exploited**
Shallow-water hake; yellowtail; oysters; anchovy; sardine; squid; South Coast rock lobster; prawns; kelps; South East Atlantic skipjack; Atlantic bigeye tuna; Indian Ocean bigeye tuna
- **4.8% – Overexploited**
Deep-water hake; West Coast rock lobster; Indian Ocean yellowfin tuna;

Waste

While there has always been a large emphasis on agricultural production, it is only more recently that the full set of food system activities from production to consumption has been regarded as fundamentally interconnected. Research has yet to fully catch up with this shift and there is a lag in the knowledge available on the food system outside of standard agricultural and economic analyses.

One of the biggest gaps lies in the knowledge of food waste in the South African food system. Three studies have been published on food waste in South Africa. Nahman et al. (2012) estimated the costs of household food waste based on the market value of the edible food portion that was wasted. The costs attributed to household food waste alone was estimated at approximately R21.7 billion (approximately US\$2.7 billion) per annum, or 0.82% of South Africa's annual GDP. This is an important figure, given that in general household food waste tends to account for less than 4% of total food losses across the supply chain (Nahman et al. 2012).

This study was then extended to include the losses across the entire food value chain, which were estimated at R61.5 billion per annum (approximately US\$7.7 billion); equivalent to 2.1% of South Africa's annual gross domestic product. The bulk of this waste arose at the processing and distribution stages of the fruit and vegetable value chain, as well as the agricultural production and distribution stages of the meat value chain (Nahman & De Lange 2013).

The results of the latest study by Oelofse & Nahman (2013) show that in 2007 an estimated 177 kg/capita/annum of food was wasted across the value chain in South Africa with that number dropping to 7 kg/capita/annum when referring explicitly to edible waste generated after purchasing or cooking.

As a neglected, yet relevant aspect of the food system, especially with concerns about the ability of the global food system to feed 9 billion people, more research needs to be done at the waste end of the food system. Understanding food waste could provide insights into dynamics in the broader food system and in particular where in the chain the most effective interventions would be to make it more sustainable and equitable.

Conclusions

While this review did not deal specifically with particular key issues in the food system such as biofuels and genetically modified organisms (GMOs), research has been done in these areas and the references are included in the Appendix. Although controversial subjects, there is still relatively little information regarding the pros and cons of both these topics. It is therefore recommended that more substantive attention be given to research in these areas in the South African context.

Overall, the general conclusions of the review show that the South African food system is dichotomous. On the one side there is an established formal, commercial sector that is connected with international agribusiness and international finance and that plays a similar role domestically and regionally, as many transnational corporations do internationally, by providing access to novel, convenient foods at a cheaper price. On the other side there is a majority of poorer, small-scale farmers and informal traders that are being marginalised by the increasing power and dominance of the corporate sector. Both sides of the food system have positive and negative elements.

The commercial sector is said to be efficient at producing sufficient food to feed the population and it is argued that economies of scale make this food more affordable.¹⁷ However, the commercial sector faces critiques about the nutritional quality and cultural acceptability of the food it produces and how accessible this food is to marginalised groups.

The small-scale farming system tends to have less of an environmental impact, is a source of economic empowerment as it provides a livelihood to many people and is a major food security provider and source of dietary diversity in rural areas. Since this farming sector is severely under-resourced under the current regime, it is more vulnerable to shocks as it operates close to the margins with little to no excess capital to create a buffer. Smallholder productivity has therefore lagged behind the commercial sector (Vink & Van Rooyen 2009). While it has been argued that small-scale farming cannot adequately provide for a growing population, especially given urbanisation trends, it must be remembered that there is a spectrum of small-scale farmers, many of whom participate in loose value chains and some of whom are linked to tighter value chains.¹⁸ Their ability to contribute to food security, even in urban areas, should therefore not be discounted. There is also potential for supporting and expanding informal markets for food, including the fresh produce and livestock produced by smallholders and land reform beneficiaries. While the evidence is still anecdotal, ongoing studies suggest that the potential for these markets is large. The National Agricultural Marketing Council (NAMC) is aiming to conduct surveys of these markets in two districts.

It is therefore necessary for policies such as the National Development Plan to strike a delicate balance between these opposite, yet interacting sides of the South African food system. The creation of a safe governance space within which an adaptive food system can be negotiated between the multiple actors operating across the food system is equally critical.

In 2002, South Africa instituted the Integrated Food Security Strategy (IFSS), but

¹⁷ However, it must be recognised that there is also a spectrum of commercial farmers. Only 1.5% of farms contribute 33.5% to cumulative farm income with 51.1% contributing a mere 13.9% to cumulative farm income (Vink & Van Rooyen 2009: 32).

¹⁸ An estimated 2 to 2.5 million small-scale producers aim to supplement food supplies from their own production, many of whom participate in 'loose value chains', but a minority of a further 200 000 produce for sale in markets and a much smaller number (perhaps 5 000 to 10 000) participate in tighter value chains (Aliber 2009; Cousins 2014).

while good on paper, its implementation required not only institutional reform within government departments but also a recognition that governance of the food system could not happen within the public sector alone (Drimie & Ruysenaar 2010; Pereira & Ruysenaar 2012). Since then, there has been an insistence in the literature on the need for a more holistic food security strategy (see Hendriks 2014; Pereira 2012). Emphasis has been placed on ensuring that the policy not only deals with government and big corporates but that it is sensitive to the fragility of many rural households and that it is able to link the objectives of the New Growth Path to those of the New Development Plan (Bank 2005; Hendriks 2013; Hendriks 2014).

However, until this strategy is forthcoming it is necessary for alternative governance interventions to start taking place in 'safe spaces' for negotiation between the multiple actors in the food system. Igumbor et al. (2012) acknowledge that government will need to engage with big food corporations in order to implement a plan that makes foods such as fruit, vegetables and wholegrain cereals more available, affordable and acceptable, and creates an environment in which non-essential, high-calorie, nutrient-poor products, including soft drinks, some packaged foods and snacks, are less available, more costly and less appealing. They identify that a good starting point would be to have discussions about the regulation of promotional activities and about imposing taxes on unhealthy food products (Igumbor et al. 2012).

The literature has some recommendations for governance interventions to help build a resilient food system in South Africa. These range from interventions at the production end of the food system, such as 'nutrition sensitive agriculture' advocated by McLachlan & Landman (2013) to more institutional interventions such as the alternative governance structures for coping with the dichotomous nature of the food system, as suggested by Doyer et al. (2007).

An overarching approach in many of the papers is the need for open and transparent engagement between government and the private sector about issues in the food system as well as the subject of land and agrarian reform.

Finally, an important aspect that emerged during the review was the role of labelling and certification schemes. Hamann et al. (2011) emphasise the need to engage actors across the value chain to discuss the role of labelling, tracing and certification schemes, and the need to consolidate existing ones. The fisheries sector has actually been the most active in this regard. Market trends are increasingly being influenced by consumer awareness programmes like WWF's Southern African Sustainable Seafood Initiative (SASSI), and eco-labels like the Marine Stewardship Council (MSC) (WWF 2011). The increasing importance of labels and certification standards in the South African food system is a governance trend that is likely to continue.

What has come out clearly in the review is the need for an urban food policy that takes into account the rapid urbanisation in South Africa and the repercussions that this is having on the food system's ability to provide food to urban dwellers (Crush & Frayne 2011; Crush & Frayne 2010). Apart from a clear need to develop national policy, there is also a need for recognising the importance of provincial

and municipal governments in implementing food security strategies, especially targeting the most marginalised groups (Drimie et al. 2009). For example, urban agriculture policies have not been as successful as they potentially could be due to a lack of understanding as to whether these initiatives are for creating income, for subsistence or to act as a social safety net (Ruysenaar 2012).

As illustrated by another case study in Gauteng, the government's response to the 2008 food price crisis showed a rural bias, emphasising that poor people should grow their own food, neglecting urban dwellers and foreign migrants without access to land (Taylor 2013).

This review indicates that there is a crucial need to engage with rapid urbanisation that has distanced people from accessing fresh fruit and vegetables and thereby decreased their dietary diversity. Coupled with an increasing monetisation of the food system where even rural communities rely on buying their food from formal and informal retail outlets, these trends are exacerbating the nutrition transition in South Africa. Given the dismal food security statistics for a country that is food secure at the national level, urgent interventions need to take place in order to prevent the current inequality in the food system from being further entrenched.

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