

Eating paper:

**Uncovering the dynamics behind household food security
in South Africa's urban spaces.**



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JOHANNESBURG

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Ethics protocol number: **H16/07/26**



A dissertation submitted to the School of Animal, Plant and Environmental Sciences,
University of the Witwatersrand, for consideration of the award of MSc.

Declaration

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Abstract

Urban food security has long been viewed as secondary to rural food security in South Africa. With the migration of the large numbers of people from rural to urban settings, it has become crucial to place more focus on urban food security, especially in some South African townships where there are high unemployment rates amongst the youth. Often the interventions towards reducing food insecurity in urban settings are taken from the interventions which were previously designed for application in the rural context. In this study the factors constraining and enhancing food security in Tembisa, South Africa are determined. This will in turn inform the umbrella approach that has often being adapted in order to combat urban food insecurity. In order to accomplish this FANTA's Household Food Insecurity Access Scale (HFIAS) is applied, which measures levels of food security and the Household Dietary Diversity Scale (HDDS), which measures the level of nutritional intake of households. Food prices of the formal and informal markets were also monitored over a period of 6 months. A significant decline in household food access over the previous four years (2013-2016) was observed in addition to relatively low quality diets. Cereals and meat were a major part of the dietary intake of many of the households. The most commonly used coping methods included borrowing either money or food from friends and neighbours, this was sometimes done in conjunction with various other coping strategies. Much of the declining food access was attributed to the inflation of food prices, the lack of formal employment and high household members to breadwinner ratios. Furthermore, government initiatives such as social grants and school feeding schemes have proven to be imperative in reducing the vulnerability to food insecurity of most households. Unfortunately, regulation of the local food system has proven to be a difficult task, and this calls for government to play a bigger role in ensuring transparency from local food value chain, whilst not undermining the role of informal markets in enhancing nutritional security in South African townships. In addition, a high reliance solely on financial capital remains a limitation to the livelihood of urban households.

Keywords: Food security, food price inflation, nutrition, formal markets, informal markets, financial capital.

Acknowledgments

I would like to thank Prof. Mary Scholes immensely for her guidance, supervision, encouragement and patience throughout the duration of this study. Thank you also to Prof. Coleen Vogel, whose insight was integral to the fulfilment of this project. Many thanks to the National Research Foundation (NRF) for providing me with the funding for this project. To my field assistance, Tshuxekani Maluleke, Mthokozisi Moyo, Sanele Mtetwa and Samuel Mamabolo, thank you for taking time from your busy schedule to assist me with conducting interviews. To MacPhee Madzivhe, and Refilwe Kai, thank you for the company during the late evening write up sessions. Much appreciation goes to the households, shop managers and vendors who took the time to answer questions pertaining to this study without a complaint. Prisca Thobejane and Nombuso Ntshangase, your words of encouragement did not fall on deaf ears. Thank you to my sister Takusani Mphaphuli who continued to encourage me and assist me when I needed it the most. A big thank you to my parents for always pushing me to be the best version of myself and also for believing in my dreams, even when they did not truly understand them.

Abbreviations

AFSUN	African Food Security Urban Network
CPI	Consumer Price Index
DAFF	Department of Agriculture, Forestry and Fisheries
DoA	Department of Agriculture
DSD	Department of Social Development
FANTA	Food and Nutrition Technical Assistance Programme
FAO	Food and Agricultural Organisation
GDARD	Gauteng Department of Agriculture and Rural Development
HDDS	Household Dietary Diversity Scale
HFIAS	Household Food Insecurity Access Scale
LSM	Living Standards Measure
NCD	Non-Communicable Disease
NDH	National Department of Health
NDP	National Development Plan
NPC	National Planning Commission
NSFAS	National Student Financial Aid Scheme
NSP	National Strategic Plan
OECD	Organisation for Economic Co-operation and Development
SADC	South African Development Community
SAHRC	South African Human Rights Commission
SAMP	South African Migration Programme
SANHANES	South African National Health and Nutrition Examination Survey

SONA	State of the Nation Address
SSA	Sub-Saharan Africa
UN	United Nations
USAID	United States Agency International Development
VAM	Vulnerability Analyses and Mapping
WFP	World Food Programme
WHO	World Health Organisation
WUP	World Urban Prospects

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Chapter one: Introduction

In the age of free housing, free schooling, child and elderly grants, food insecurity continues to be a persistent problem in our society. Where have we gone wrong? What have we missed? And is it really the states problem? In South Africa, approximately 53% of the country's population was living below the poverty-line in 2010, and 22.3% households experienced inadequate access to food in 2016 (Stats SA, 2017). Studies have shown that the number of food insecure households has decreased over the years, but have they? The statistical data and what has been observed on the ground do not seem to be matching up and it seems as though there is a critical dimension which has been left out in previous research which has resulted in the underestimation of the numbers of food insecure households, that factor may in fact be urban household food security.

After the world food summit in the year 2000, the millennium development goals were established, with the first goal targeting the halving of extreme poverty and hunger by 2015, the MDGs first goal has been replaced by the second Sustainable Development Goal (SDG 2), which aims to: "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture" (UNDP, 2000; United Nations, 2000). The establishment of the SDGs and their predecessor were integral as they addressed the issue of food insecurity and the right to food, which is a legal obligation by the South African Constitution (Constitutional Assembly, 1996, Section 27 (1) (b)). In South Africa, a study on the food security status of children showed that in 2014, approximately 2.1 million South African children lived in households where child hunger was reported. Of those 2.1 million children, 800 000 of them were reported to be under 5 years of age (Delany *et al.*, 2016). A 2014 Nation Health and Nutrition study found a high prevalence (43.6%) of Vitamin A deficiency amongst South African children less than five years (Shisana *et al.*, 2014). The prevalence of stunting between 1-3 year olds had increased by 11.3% since 2005 (Shisana *et al.*, 2014). Children under 5 years of age are amongst the groups that are most vulnerable to food insecurity, as it has adverse effects on the mental and physical development of the affected child, and so this number should be concerning to the reader (Bain *et al.*, 2013).

South Africa is said to be food secure at a national level, however the above-mentioned facts show a major disconnect between this statement and the reality of South Africans (DAFF, 2011). Part of the reason for this disconnect is because although South Africa produces enough food to provide for the population as a whole, but this food is not evenly

distributed amongst South African households. The uneven distribution of food is one of the causes of the high levels of food insecurity amongst South African households. The high levels of poverty in South Africa, has led to South African households being more vulnerable to food insecurity (Stats SA, 2017).

In 2010 at the South African State of the Nation Address the government took a decision to make food security a priority, which ultimately led to the development of the long overdue National Food and Nutrition Security Policy in 2013 (Zuma 2010; DAFF 2014). Although the child health and nutrition programmes have contributed to reducing food insecurity in the country, resulting in fewer child deaths caused by malnutrition, by almost 50%, a lot of work still remains to be done to understand the nuance of interacting factors to reduce food insecurity at all levels. Especially in a country where there is not sufficient focus on urban households, resulting in lack of representation and interventions (Battersby *et al.*, 2015).

Food insecurity has been considered to be a rural household challenge for a long time in South Africa (Battersby *et al.*, 2015a; Rudolph *et al.*, 2012 and Crush *et al.*, 2011). This has resulted in more emphasis being placed on interventions in rural communities, and often where there are interventions offered to urban households, they tend to be more applicable in the rural context (Battersby *et al.*, 2015a; SPII, 2015). This has resulted in a significant representation of the South African population being overlooked where food security is concerned.

1.1 Problem statement

Townships bear the brunt of past inequalities and are often characterised by high levels of unemployment, crime and low levels of education. Limited financial access to local food markets make South African townships a melting-pot for matters pertaining to food security (Tacoli, 2016). Most townships in South Africa were strategically placed on the outskirts of highly developed areas, a means of keeping a certain group out of the developed inner city (SAHA, not. dated.). Only a few studies on food security have been conducted in South African townships, studies that have been conducted were mostly in areas such as Soweto and Alexandra (de Wet *et al.*, 2008; Rudolph *et al.*, 2012; Molelu, 2014; Malan and Campbell, 2014). These studies showed that there is a high prevalence of food insecurity in

Soweto and Alexandra with many of the food insecure households in Alexandra having no way of preparing themselves against the vulnerabilities of unexpected socio-economic changes which may result because of food insecurity (de Wet *et al.*, 2008; Rudolph *et al.*, 2012; Molelu, 2015; Malan and Campbell, 2014).

One of the interventions put in place by the South African government to combat urban food insecurity was the promotion of urban agriculture (Battersby *et al.*, 2015a). Unfortunately this intervention addressed food (in)security as an issue of “availability” not of “access”, and further revealed the flaws in the manner in which we address urban food (in)security in South Africa (SPII, 2015). Thus, South African townships, which are home to a large number of the urban poor and a significant proportion of the national population is undermined in the current food policy (DAFF, 2014).

1.2 Purpose statement

Recent reports by the African Food Security Urban Network and Battersby (2015a) have shown that there is a knowledge gap in the information pertaining to urban food systems, especially with regards to informal markets and their importance within the food system. Current interventions do not target the central drivers of household food security in the communities, nor do they acknowledge the role that street vendors and other informal markets play in combating or enhancing food insecurity through provision of accessible and affordable food (Tacoli, 2016). Institutions such as Stats SA monitor food prices rigorously and present them through the Consumer Price Index, however, a gap still remains in the promotion of studies geared at monitoring and understanding the informal economy.

1.3 Study rationale

In the National Policy on Food and Nutrition Security report, it was noted that the lack of adequate, timely and relevant information on food security, has presented itself as a challenge to achieving food security in South Africa (DAFF, 2014). It is therefore my belief that a study such as this will not only add to the existing information about food security in South Africa, but more so in a space which for years has been under-represented in National Policy, ultimately bringing forth research that is relevant to our current state as a nation.

In light of the afore-mentioned factors, this study examines and aims to improve and understand parts of a complex urban food-system that are affecting food security within urban poor households in Tembisa, the second most populous township in South Africa (Stats SA, 2011). Such a study may possibly yield results that will emphasize the need for more inclusive policy-making, which does not further marginalize the urban ‘poor’. As a result, there is an opportunity to gain further insight into how low-income urban communities are coping in the midst of the recent economic, political and climate challenges.

1.4 Aim

To better understand the underlying factors responsible for the state of urban household food security in Tembisa, Gauteng. (July 2015 to May 2017).

1.5 Objectives and key questions

1. To assess the extent to which households are food secure in Tembisa.
 - Are household’s food secure, what foods are they consuming and how much food are they consuming?
2. To assess the drivers of food insecurity/security in urban households
 - What are the leading structural characteristics within the household driving household food security?
 - What coping strategies are adopted by urban households to combat food insecurity and how effective are they?
3. To evaluate households’ access to formal and informal markets and their importance in urban communities.
 - How do food costs and inflation rates differ between formal and informal markets and how does the difference affect households’ access to these markets?
 - Which are the most prominent perceived drivers of food price increases within the retail outlets?

Chapter 2: Literature review

2.1 A breakdown of food security.

There are several definitions for food security, however in this study we choose to focus on the World Food Summit definition which defines food security as “A situation that exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” (World Food Summit, 1996). Failure to meet the terms and conditions stipulated in the afore-mentioned definition results in a state of food insecurity, which often presents itself at different intensities between individuals, households and communities. Food security can be measured at four levels, namely: individual, household, community and national levels of food security.

Often research conducted on food security requires researchers to identify the extent to which each representative sample is food secure with the purpose of being able to recognise urgent cases from less urgent cases, and because of this, a classification system is used to determine the intensity of food insecurity at the different scales. In this classification system individuals can range from being “food secure” which is ideal, to “severely/chronically food insecure” - the worst case scenario. At the moderate stage of food insecurity, food intake is reduced and individuals skip meals as a result of not being able to acquire food, either financially or physically, ultimately leading to starvation and severe food insecurity (Bickel *et al.*, 2000; Castell *et al.*, 2015; Figure 1).

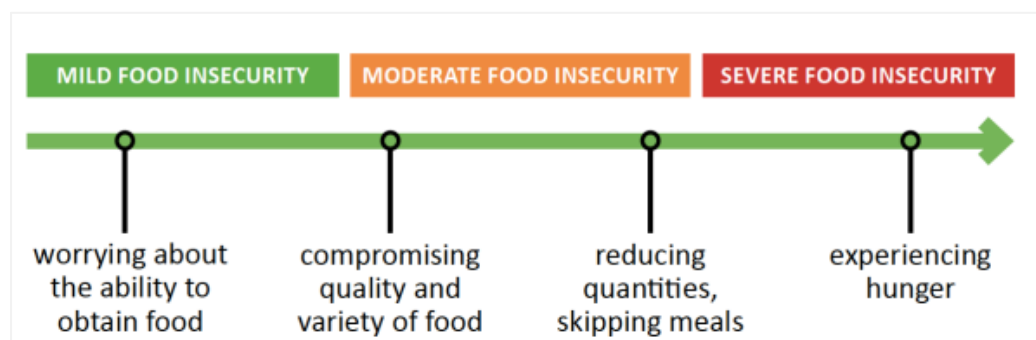


Figure 1. Food security classification levels where varying degrees of severity are portrayed (Pereira *et al.*, 2017).

The pathway to food insecurity can begin as a state of concern about food, accompanied by a gradual escalation where starvation occurs. However, due to sudden shocks, individuals can move from being food secure to a point of experiencing extreme levels of food insecurity (Figure 1). This can happen in instances where climatic shocks in the form of droughts and floods occur, often eroding critical household livelihood activities and leaving households with no means of cushioning the effects of the loss.

There are four dimensions to food security, namely: availability, access, utilization and stability. “Availability”, which is the physical presence of food as a result of growing, followed by manufacturing, importing or transporting it to where it is needed, is of key importance when assessing households that grow their own food. “Access” is the extent to which people are able to obtain the available food; this may be affected by the wealth status or geographical location of the individual or household and can be highly affected by sudden increases in food prices or distance of retail outlet from households. Access is an issue which affects urban households as they mostly rely on food acquisition through the markets. In addition to access and availability, food utilization, which is often overlooked is important because how food is used, prepared and stored, ultimately affects the quality of food consumed. Lastly, the “stability” dimension of food security brings together the steadiness of factors which may have an impact on availability, access and utilization of food, such as the state of climate change, food prices, politics and economic factors also known to indirectly affect food security in a household (FAO, 2008).

Food systems and the activities surrounding food systems such as production, processing, packaging, distribution, retailing, and consumption of food play an integral role in food security and influence the four dimensions to food security (Ericksen, 2008). They are driven by social, economic and environmental factors which in turn affect the stability of a household. This makes the subject of food security complex as there are sums of factors which contribute the system affecting food security (Ericksen, 2008).

2.2 Food nutrition

Although insight on food security continues to focus on the hunger aspect, due to the impact it has on an individual, with long-term negative implications for household productivity, the nutrient aspect, which is equally important is often overlooked (UNDP, 2012). In the recent years more research in South Africa has begun to address food security beyond it being an issue of hunger (Drimie *et al.*, 2013; Hendriks, 2015; Figure 2). Under-

nutrition and over-nutrition have been identified as critical stages in the food security continuum, more so in urban spaces where dietary changes have led to the increased intake of non-nutritious food (Faber *et al.*, 2017; Battersby 2016). Micro-nutrient intake may vary within a household, making some household members more vulnerable to nutrient deficiencies and more likely to becoming burdened by non-communicable diseases (Faber *et al.*, 2017). These often affect breadwinners within households and act as a stumbling block towards the achievement of SDG 2 and SDG 1 (UN, 2000). The vicious cycle of poverty and loss which haunts the poor is often as a result of non-sustainable food sources. Children often become stunted as a result of micronutrient deficiencies and are thus unable to function at their optimal levels. Therefore, although achieving food security in terms of eradicating the number of cases of hunger remains important, further effort needs to be placed in maintaining adequate nutrient intake once hunger has been addressed. In doing so, we address the nutrition security aspect of the food security continuum and address the issue of sustainable foods (Hendriks, 2015).

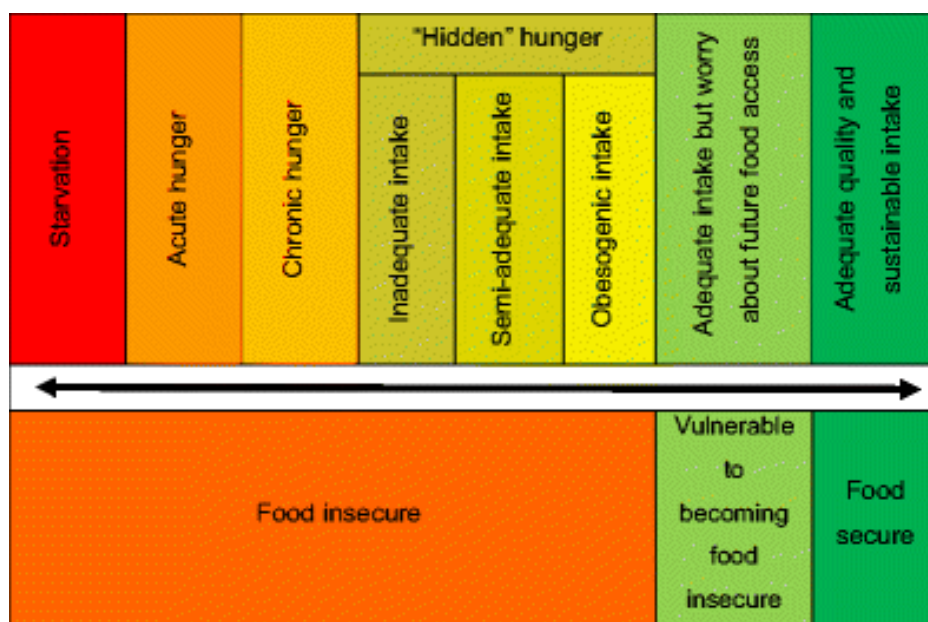


Figure 2. The food security continuum based on the transition of experiences of an individual through different levels of food security, where malnutrition and over-nutrition are incorporated as stages in the food security continuum (Hendriks, 2015).

The achievement of food security cannot truly exist without it being sustainable, and according to the FAO's Sustainable Diets and Biodiversity report (2012, p7) this

encompasses consumption of food that is affordable, culturally acceptable, not harmful to the environment and nutritionally efficient.

2.3 Drivers of food insecurity

Not enough is known about the drivers of urban food security, and this further necessitates research on urban food security (Battersby, 2013). Urban food security is multi-dimensional in the sense that it not only of hunger and undernutrition, but also over-nutrition, where the highest reports of obesity originate from urban spaces (Battersby and McLachlan, 2013). The drivers of food in-security can be demographic, economic, socio-political, scientific, cultural, and religious or even technological (Misselhorn, 2005). Manyamba *et al.*, (2012) identified casual or temporary employment, migration, rising food prices particularly cereal, break-down of social capital, decline in health, climate stressors, rising energy costs and agricultural potential of land are drivers of food (in)security (Battersby and McLachlan 2013; Misselhorn 2005). The above show that there are an array of factors driving food (in)security, but the difficulty in addressing food security is that different drivers of food insecurity require different interventions, and policy responses (Battersby, 2013).

A high reliance on the cash economy combined with income poverty are two drivers of urban food insecurity. The lack of income, in instances where food access is solely based on financial capital increases the likelihood of food insecurity. Geographical access is another key driver of urban food insecurity, where distance to shops may act as a limitation to household access if they have no mode of transportation (Battersby, 2013). Although geography is often addressed in terms of access to food retail, geography also acts as a limitation to employment access, especially in South African cities where the poor reside on the peripheries of the cities where there are fewer work opportunities (Battersby and McLachlan, 2013). The limitation in determining drivers of food insecurity at a household and individual level, is that these drivers exist at multiple scales, both originating from within and outside the household (Misselhorn, 2005).

2.4 A South African overview

2.4.1 Poverty in South Africa

When asked what they deemed as poverty, a large proportion of the African population viewed poverty as the lack of food, over lack of employment and money (Frayne *et al.*, 2010). Evidently, poverty and food insecurity are not mutually exclusive, so in order to understand the dynamics of food insecurity in South Africa, the current state of poverty has to be understood. South Africa is no stranger to multitudes who have had the misfortune of living below the poverty levels in conditions that are unbecoming. The continuous mushrooming of informal housing such as shacks in vacant land makes this even more evident, and Kroll (2016) characterises these areas as pockets of deep poverty. Recent statistical reports by Stats SA show alarming changes in the status of poverty in South Africa, with poverty levels shifting from a reported decrease between 2006- 2011, to a rise in poverty by 2.8 million in 2016. Those who are most affected are individuals over 55 years and under 17 years (Stats SA, 2017). Due to the evidence of the strong relationship that exists between poverty and food security, any rise in the number of poverty-stricken households is relevant to the status of food security in South Africa (Manyamba *et al.*, 2012).

2.4.2 South Africa's socio-economy

South Africa has one of the highest rates of inequality in the world, a study by Statistics South Africa (2017) found that inequality remained high with a Gini coefficient of 0.64 and 0.68 for males and females respectively. With the country experiencing low rates of economic growth since 2010, the number of unemployed persons continues to rise, with approximately 30% of the population being unemployed (Stats SA, 2017). The status of employment is a key driver of household food security and thus 30 % of the South African population being unemployed is alarming. The increases in unemployed South Africans continues to be a hindrance to fulfilling the Sustainable Development Goals in a country where food inflation has been on a rise since post 2010 (Stats SA, 2016).

2.4.3 HIV and Food security

Given the prevalence of the pandemic in South Africa, any attempt to address food insecurity, poverty and South Africa's current socio-economy without addressing the HIV pandemic can be viewed as ignorance. As food prices continue to rise, the vulnerability of PLHIV increases as well (Gillespie *et al.*, 2009). Adults living with HIV need 30% more than their usual nutritional intake in order for their treatment to be successful. During periods of food price hikes, as observed in 2008, poor households need to take an even larger proportion of their household income to use it on food. Gillespie *et al.*, 2009 reports that, in many of these cases, in both Eastern and Southern Africa, PLHIV resort to leaving treatment because the treatment tends to increase one's appetite and if not taken with adequate nutrition, the individual may experience the side-effects more severely than someone who has taken the ARV treatment under good nutrition. It has further been observed that increased food prices increase risky behaviour, which increases an individual's exposure to the disease (Gillespie *et al.*, 2009). When given a choice between dying of hunger and dying of HIV, the immediate need to eat is viewed as more important, and so, individuals may exchange sex for food or for money to buy food (Gillespie *et al.*, 2009).

The impact of HIV is bi-directional, in the sense that food insecurity hastens the progression of the disease and HIV negatively impacts on the ability of an individual to do work, and this negatively impacts wealth, through the decline of household incomes (De Klerk *et al.*, 2004). Limited financial resources are stretched even further due to the increased expenditure on healthcare which is needed to take care of the affected household member/s (De Klerk *et al.*, 2004). In some unfortunate case, death of household member, more so the breadwinner is often coupled by an increase of orphaned children and decrease in the nutritional status of household as a whole.

2.4.5 Food security: The South African nutrition story

In many South African studies on food security, dietary diversity is used as a basis for determining whether the micro-nutrient intake of individuals or households is adequate, where a score below 4 is viewed as inadequate (Rudolph *et al.*, 2012). The basis of the dietary diversity score is that a variety of foods need to be consumed because no one food contains all necessary micro-nutrients needed for an individual to maintain a balanced diet. A low dietary diversity score is often associated with low weight and stunted growth.

Due to lack of resources there has been a huge compromise on nutrient efficient dietary intake in the country, and this is well-documented through the increasing reports of non-communicable diseases amongst the South African community (Battersby, 2017; Faber *et al.*, 2017; Drimie *et al.*, 2013; NPC, 2012). Although the number of hunger reports in South Africa has decreased, nutrition appears to be a rising problem amongst South Africans (Altman *et al.*, 2009). In South Africa, 23% of the children (1-3 years) showed signs of chronic malnutrition (Shisana *et al.*, 2014). With urbanisation, there is a shift in diets towards food stuffs which are causing the increased instances of Non Communicable Diseases (Battersby *et al.*, 2015b). Traditional diets, which are often healthier, are being forsaken based on their perceived association with poverty (Kroll, 2016). The transition from rural to urban diets often involves an increased intake of sugars and fats and a low intake of fibrous foods. The Shisana *et al.*, 2014 study on South African health and nutrition managed to show how South Africa's urban populations had significantly higher intakes of fats and sugars, when compared to their rural counterparts (Shisana *et al.*, 2014; Oldewage-Theron and Kruger, 2008). Of all the urban areas which were accounted for in Shisana's study, it was found that Gauteng's urban residents had the highest reported consumption of fats and sugars in the country (Shisana *et al.*, 2014).

Often, low-income South African households have a heavy reliance on starch-based diets which do little in providing South Africans with adequate nutrition, however these dietary choices are energy-dense and filling, thus preventing individuals experiencing hunger faster (Battersby and Crush, 2014). These low-income households spend more than a third of their income on maize meal, brown bread and cereals (Kroll, 2016). Low-income urban households often have a limited range and quantity of fruit that they can consume as compared to higher-income households, who are able to eat up to three times more fruit than urban poor households (Kroll, 2016). In Cape Town, almost half (47%) of the urban households interviewed never ate fruit and 38% of the households rarely ate vegetables (Crush *et al.*, 2011; WHO 2003b). The lack of diverse, nutrient efficient dietary intake amongst the urban poor is strongly associated with their economic standing, which limits what they are able to purchase.

In addition to the cost of food, food preference continues to be a limiting factor amongst the South African population (Manyamba *et al.*, 2012). The South African population has a higher preference for cereals as staples in their diets and unfortunately and

these cereals are the first to be affected by food price increases (Manyamba *et al.*, 2012). Roots and tubers, which are affordable foods, are often overlooked as an alternative food source, and it appears that the attitude towards these alternative food sources may be a limitation to achieving food security in these communities.

According to the SANHANES-1, a low dietary diversity score was often associated with ailments such as dyslipidaemia, metabolic syndrome and cardiovascular problems. With urbanisation happening at a fast rate, non-communicable diseases have become an increasing issue amongst South Africans. Households have shifted to more western diets which are high in fat and sugars and low in nutrients, this phenomenon has been coined the “nutrition transition” (Drewnowski and Popkin, 1997). The urban poor are amongst the populations who have shifted their diets from traditional diets dominated by vegetables to diets made from cheap fats, fast foods and caloric sugars, which have given rise to obesity amongst the South African population (Drewnowski and Popkin, 1997).

The nutrition transition was previously associated with wealthier households however, there is evidence of the nutrition transition happening amongst lower-income households (Drewnowski and Popkin, 1997). Although the South African consumer continues to have a big influence on the changes in status quo in dietary choice, it is suggested that “Big Foods” in South Africa may have played an integral role in these dietary changes. There have been increased levels of consumption of processed food as compared to the consumption of traditional diets (Igumbor *et al.*, 2012). The author further elaborates that the affordability and availability of these big foods to households, makes them an easy choice for the consumer when compared to the prices of healthier food (Igumbor *et al.*, 2012).

2.4.6 Why urban food security in a developing country?

In the past years there has been an increased awareness of the limited attention policy has placed on urban food security, thus Battersby (2013), places emphasis on why there is a need for finer grained studies on urban food security in areas such as Gauteng and the Western Cape, which are often under-represented when it comes to the urban food insecure populations. For a long time, food security initiatives have been focussed in rural areas, due to South African history which resulted in many households being located in rural areas where there was minimal economic inclusion and consequently higher rates of poverty (Battersby, 2013). Between 1960 and 2010, the urban population in Africa grew from 53

million to 400 million and currently in South Africa, over two thirds of the population already reside in urban areas (Figure 3; Turok, 2012).

Even though there were more people living in South Africa's urban areas than those living in rural areas in 2012 (Figure 3; United Nations WUP, 2007, p. 6), the assumption that urban areas represented wealth, whilst rural areas represented poverty still exists. In contrast rapid urbanisation is said to marginalise the urban poor further, especially in South Africa where a large gap remains between the rich and the poor, furthermore, Lemma and Rao (2013) have found that urbanisation is often accompanied by poverty, malnutrition and food insecurity (UNDP, 2016) . In 2007, more than 30% of the extremely hungry households in South Africa were reported to reside in the urban spaces of Cape Town, Ekurhuleni and Johannesburg (Altman *et al.*, 2009; NDP 2012).

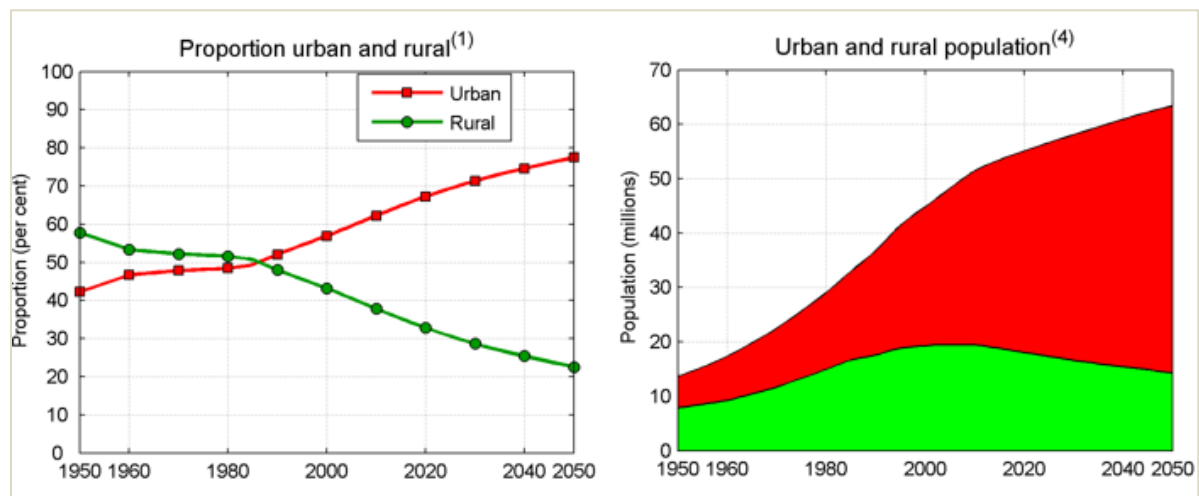


Figure 3. Urbanisation in South Africa, past, present and future projections. The South African urban population is projected to exceed 75% by 2050 (United Nations, 2014).

The majority of the individuals migrating to these cities are often job-seekers (Stats SA, 2012a). According to the United Nations World Urbanisation Prospects Report, the percentage of South Africans living in urban areas is projected to increase to over 75% by 2050 (United Nations WUP, 2014). This continuous influx of individuals from rural to urban settlements is an indication of how there should be a sense of urgency regarding urban food security becoming as much of a priority as rural food security is, amongst government agencies (Stats SA, 2012a).

Individuals living within these urban areas usually acquire their food sources from their local supermarkets, and informal vendors with limited options of planting vegetable gardens

or borrowing from their neighbours. The cost of living within these urban areas is usually about 30% higher than in rural areas (Frayne *et al.*, 2009). In addition, rural households spend 15% less on food per household member compared to urban households (Altman *et al.*, 2009). A comparison of rural versus urban food security in the Eastern and Western Cape showed that although the prevalence of rural food insecurity was higher the severity of food insecurity was higher in urban areas (Battersby, 2012). Therefore, when drought occurs and local currency depreciation occurs, often increasing food prices, households situated within these poor urban areas are sometimes unable to cope with such changes (Calzadilla *et al.*, 2013; Verpoorten *et al.*, 2013). Despite the disadvantages that come with urbanisation, national government continues to encourage those coming from rural areas to migrate to urban cities under the assumption that urban cities offer easier access to services and secure employment, sadly some individuals find themselves in a worse of position than they were in before migrating to urban spaces (NDP, 2012).

2.4.7 Urban households' livelihood strategies

There are 5 types of capital, namely: human, social, natural, manufactured and financial capital and because urban households acquire their food solely from large retail outlets, small supermarkets and street vendors, and have a higher reliance on financial capital than rural communities, they are often highly vulnerable in these urban spaces (Scoones, 1998; Figure 4). The high reliance on one source of capital amongst the urban poor makes them unable to respond to shocks, or changes in trends. The sustainable livelihood framework shows that diversity in the types of capital used in a household and their abundance is integral for insuring a sustainable livelihood during times of shock, because people are able to switch from one capital to the other as they see fit (Scoones, 1998). However, in poor urban households there is usually little diversity or abundance in the types of capital, especially in townships where there are high levels of unemployment and low levels of education. These areas are usually under-developed with a high prevalence of communicable and non-communicable diseases (NDH 2017).

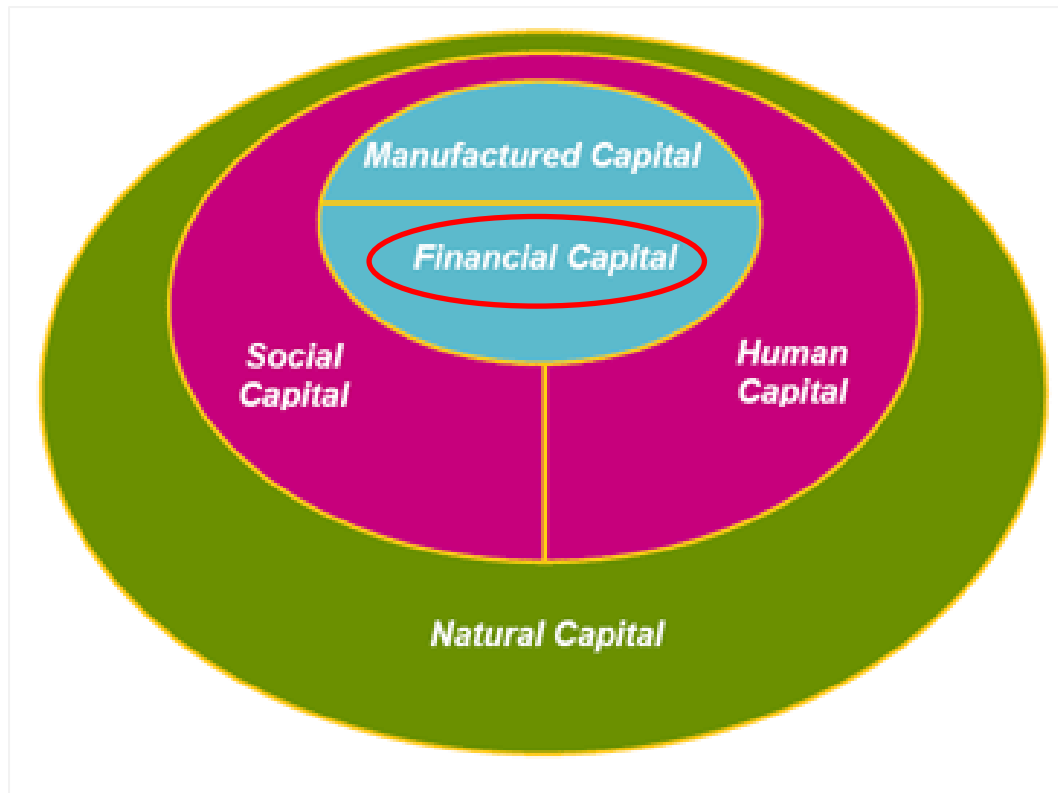


Figure 4. The five capitals where people derive their goods and services from in order to improve their quality of living, namely social, financial, manufactured, natural and human capital, this is based on the Sustainable Livelihood Framework (Forum for the future not. dated).

An outcome of a study by Tibesigwa *et al.* (2016) was that rural households with strong social capital tended to have higher access to food. This is because having social networks, either through friends, family, neighbours, the groups one is a part of or even the owner of the local supermarket allows for increased access to resources an individual may lack during times of shock. These networks can be used as safety nets during difficult times. For instance, if a household runs out of food, they are able to request assistance from the networks they have formed, even more so if they have good relations with the different groups which form their social network, therefore increasing their ability to withstand shocks that may arise. One such shock being climate-related disasters, which are often accompanied by food price surges.

2.5 Climate change and food security in South Africa.

Rapid climate variability and change is taking place and is impacting agricultural production and ultimately food availability (Cline 2008). Due to high carbon emissions linked to the vagaries of climate, global mean temperatures are expected to increase by at least 2°C and this will have an adverse impact on the agricultural industry in some parts of the world, more especially the African continent (Solomon *et al.*, 2009; Beddington *et al.*, 2012; Müller *et al.*, 2011). Reduced available soil moisture will be a consequence of the reduced annual precipitation, ultimately affecting crop yields negatively (Bain *et al.*, 2013). In the case of South Africa, higher temperatures, variable rainfall and increased aridity in some areas have been projected. Bearing in mind that South Africa is already categorised as an arid and water stressed country, where over 80% of South Africa is considered semi-arid, receiving below 600mm of rainfall annually, any decrease in precipitation is expected to adversely impact food production (Bond *et al.*, 2008). When the expected change is coupled with the fact that South African soils are vulnerable with minimal resilience to activities such as the ploughing, which makes them less resistant to soil erosion and the loss of soil organic matter, there is good reason for concern (Mills and Fey, 2004).

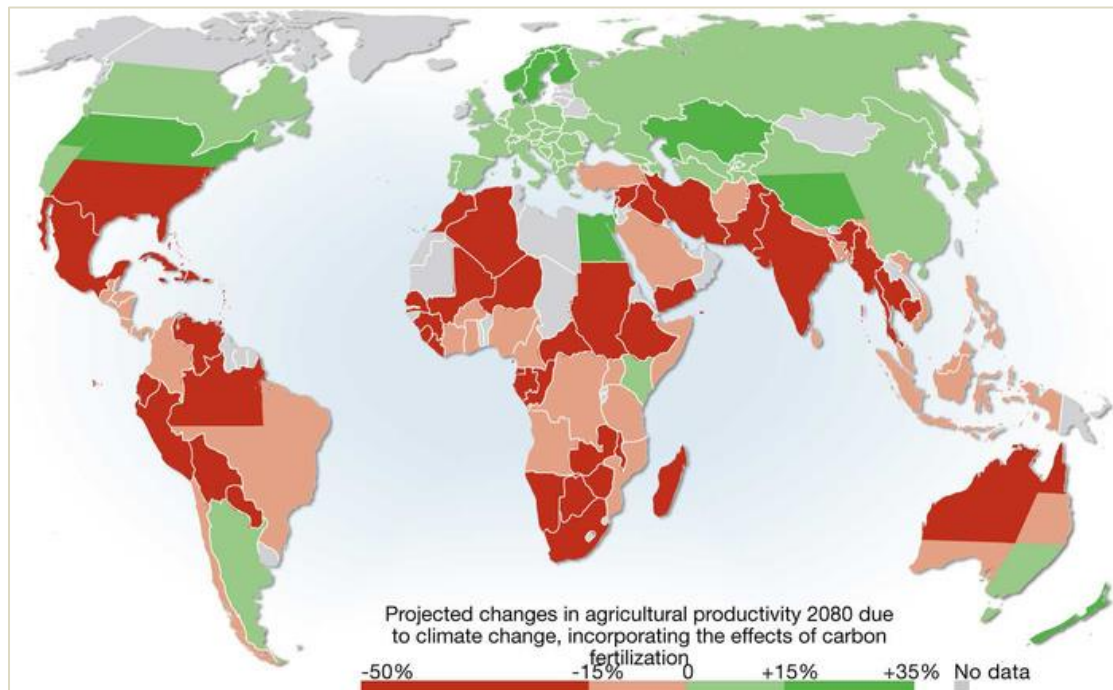


Figure 5. Projected change in agricultural production by 2080 due to agricultural change. Agricultural productivity in South Africa is expected to decline by up to 50% by 2080 (Cline, 2008).

Rainfall variability, depleted soil quality and ultimately more frequently occurring extreme events, such as droughts, will be detrimental to the food security of South African households, in terms of access and availability (Figure 5). Decreased crop yields, shorter growing seasons and increased food prices are expected. Increased pricing of maize and wheat is expected to hit the urban and rural poor the hardest (Altman *et al.*, 2009).

It has already been reported that Southern Africa has become drier than it was 20 years ago and climate-change related food price hikes have already been recorded in the past year in South Africa, due to the 2015 drought caused by an El Niño event, where the lowest rainfall was recorded in South Africa since 1904 (Bain *et al.*, 2013; OECD-FAO, 2016). South Africa experienced low maize production in 2016, due to the drought, which was reflected in the record breaking maize prices. South Africa's maize imports increased and an effort was made to stabilize prices in order to reduce the burden on consumers. If 2016 is a reflection of what rapid change and unpredictability in the climate can do, there is much work that remains to be done in developing mitigation plans that do not lean more towards stop-gap methods of dealing with issues of food insecurity. More so, since the instability in climate will affect food prices, which will be felt the most by the poor and even more so by poor PLHIV (Drimie and Gillespie, 2010).

2.6 Urban food security and food pricing

Food pricing plays an integral role in food security, either opening the gates to a nutrient efficient meal, or restraining individuals with regard to what they eat and how much they eat. This was evident between 2008 and 2009 there was an increase in food insecure households, due to the global recession that was happening at that time (Altman *et al.*, 2009). Around 78% of the households interviewed around that time associated their lack of food availability in the household over 6 months to the increased food prices (Frayne *et al.*, 2010). Food inflation between 2007 and 2008 meant that low-income households had to spend almost 22% more to maintain the same food basket (Frayne *et al.*, 2010). With regards to inflation, food continues to experience the highest rate of inflation in South Africa when compared to other commodities such as transport (Figure 6).

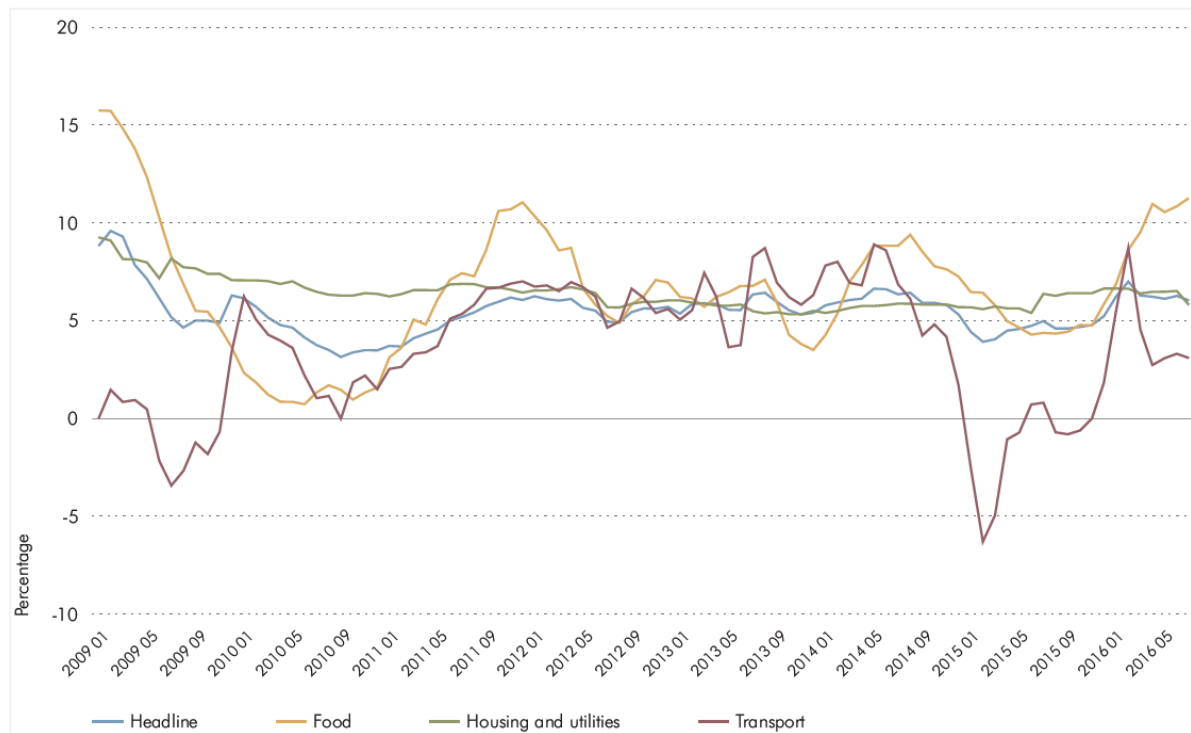


Figure 6. An illustration of the inflation of various commodities between 2009 and 2016, based on the South African Consumer Price Index (CPI), (Stats SA, 2017).

The important role that the price of food plays in food security is most-evident in urban households, where the majority if not all of the food found in the household has been bought, unlike in rural households where food can either be produced or purchased by the household. It is further worsened by the fact that urban poor households buy smaller food quantities of food at higher prices due to lack of money to buy in bulk and lack of household equipment to store the food (FAO, 2012). The FAO (2012) study revealed that the current urban poor population may be underestimated, as a result of lack of accounting for the higher cost of living in urban areas. Unlike urban households, households residing in rural settings are able to draw on other means of acquiring food when they come upon hard times. A study by Aliber (2010) shows that on average, an urban poor household spends more money on the same food basket per household member than rural poor households.

In South Africa, between March of 2015 and 2016, the cost of the basic food basket, rose by 9.8% (Figure 7). During this time fruit and vegetable prices increased at a higher rate (18.7%) than any other food (Statistics SA, 2016). The high prices -which are reported to be the highest since four years before - have led to vegetables becoming unaffordable possibly directly, impacting the nutritional intake of South African households (Statistics SA, 2016).

The unfortunate part about food inflation is that it happens at a higher rate than the inflation of people's incomes, often subjecting low-income households to food stress as a result of volatile food prices (Battersby *et al.*, 2015b). Every increase in food prices or compromise in wages is often coupled with threatened levels of food security (FAO, 2012).

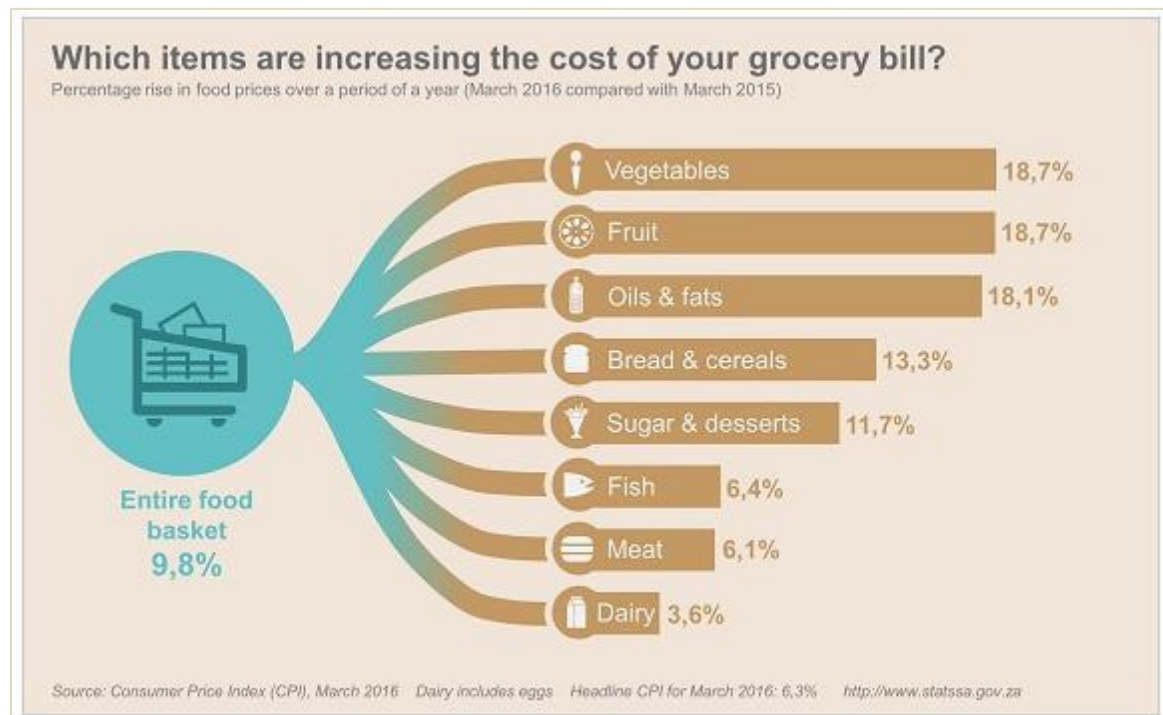


Figure 7. Inflation of various food items, with fruit and vegetables showing high levels of inflation for fruit and vegetables between March 2015 and March 2016 (Stats SA, 2016).

Even in cities with high rates of economic growth, there is no guarantee of middle and low-income individuals being able to cope with high inflation rates due to a range of socio-economic factors (Frayne *et al.*, 2009). A huge gap between the urban wealthy and poor in Gauteng still exists (Figure 8). A clear gradient, between the urban middle-class, poor, and urban rich is evident in Figure 8, which is a depiction of the relative gap between the rich and poor in our society.



Figure 8. The aerial view of Alexandra Township and Sandton, Johannesburg, where the foreground represents the informal and formal settlements of Alexandra and the green belt represents middle to upper income areas of Sandton (Image Courtesy of Google images).

A recent study by Rudolph *et al.*, (2012, p. 9) found that:

“Levels of food security in Johannesburg are principally related to household income and the ability to access food through purchase”

The main challenge to food security in light of climate variability, change and disasters, is not just availability of food, but also access to food. Downward effects of availability such as the instability and rise of food prices contribute to the high levels of food insecurity in poor urban areas because of the lack of income (Battersby, 2012). Informal markets are often seen as a good alternative to combat food insecurity. However, these markets may not always be the most secure or hygienic settings for purchasing food (Rudolph *et al.*, 2012).

According to the FAO (2012) report, in order for households in urban poor areas to consume healthy diets, they would have to spend up to 50% of their income on food, which is difficult in light of the fact that income in these household does no solely serve the purpose of food provision. Increased food prices affect those who spend 50% or more of their income on food in a very negative way because they are unable to spend any more of their income on food, which means they are put to a position where they have to compromise their dietary intake (Hendriks, 2011).

From 2015, South Africa has been experiencing the worst drought since 1982, which has affected crop production and has led to food price hikes (BBC News, 2015). It was projected that food prices were set to rise by 11% in the fourth quarter of 2016, which is the highest rate of food inflation in South Africa since 2011 (Sunday Times, 2016). The 2015/2016 drought pushed 50 000 more South Africans below the poverty line (World Bank, 2016). Although the drought was not solely responsible for food price hikes, it still played a significant role in the increased cost of food, and the decline in food secure households.

Under such circumstances, individuals begin to look to government for aid, in the hope that mitigation strategies have been put in place to address unforeseen disasters such as these, and this is where policy on food security comes into effect.

2.7 An overview of key policies

2.7.1 The Policy on National Food and Nutrition Security

The Policy on National Food and Nutrition Security was officially released in 2014. From the report it was observed that a higher number (58%) of South African households residing in rural areas experienced hunger than their (46%) urban counterparts (DAFF, 2014). Since two thirds of South Africa's population resides in urban areas, this would mean that an estimated 2.8 million rural households experienced hunger compared to the 4.4 million hungry households in urban areas. The manner in which these statistics are reported in the policy, would lead the reader into thinking that food insecurity is more of a problem in rural areas than it is in urban areas. Such methods of reporting statistics show a visibly skewed bias towards rural food insecurity. In 2017, Stats SA reported that the highest documented incidences of malnutrition were from Gauteng, a highly urbanised province in South Africa (Stats SA 2017), the same province which was found to have the second highest number of households living poverty in 2014 (DAFF, 2014). However, only 16% of Gauteng households were beneficiaries of at least one of the governments' social security initiatives (Stats SA, 2017).

Battersby (2013) also identified that food security-related policies in South Africa are often placed under the Department of Agriculture's directive, which Drimie and Ruysenaar (2010) view as further limiting solutions to production and agricultural initiatives. Although

food access is mentioned in the policy, due to the nature of the markets it becomes difficult for the state to step in and ensure affordable, high quality food for the poor.

Battersby (2013) observed that the urban community is often neglected when it comes to the development of food policy. Unfortunately, cities in South Africa are not mandated to address issues of food security and thus responses to urban food insecurity are often incidental or indirect in the sense that they may rise from initiatives which were not directed at food security i.e. infrastructural development and retail distribution.

The National Food and Nutrition Policy does not incorporate cities into its mandate of achieving sufficient access to food for all citizens (DAFF, 2014). Many of the arguments stated in the policy are centralised around production and non-urban dwellers, cities continue to lag behind when it comes to food insecurity initiatives (DAFF, 2014). This leaves the mandate of food security in the hands of local municipality, which are often focussed on the economic development of cities and not necessarily food security.

2.7.2 Urban agriculture in South Africa

Urban agriculture is defined as the production of food (herbs, crops, vegetables, fruit, flowers, cultivation) within a city boundary or on the immediate periphery of a city (Gittleman, 2009). The sustainability or impact of urban agriculture is measured at either a micro (household), or a macro-level (town). A key advantage of urban agriculture is the increased nutritional status of individuals and households (Gittleman, 2009).

In a summit held in the Gauteng province following the food riots in different parts of Africa as a result of the global recession and food inflation around 2008, the government responded by saying:

“...the poor must be self-sufficient and grow their own food” (Taylor, 2013, p. 760). The government managed to overlook that there are structural challenges which hinder urban households from *“growing their own food”*. Unlike in rural areas where there is usually communal land to grow food, most urban land in the city has been converted from its natural state and is surrounded by low quality soil (Statistics SA, 2012a). Termeer *et al.*, (2018) observes that such responses were a reflection of how food security remained rurally biased in South Africa (DoA, 2002; du Toit, 2011; DAFF, 2014).

2.7.2.1 Urban agriculture in Gauteng

A study conducted by Statistics South Africa showed that households in Gauteng participated the least in agricultural activities (Figure 9).

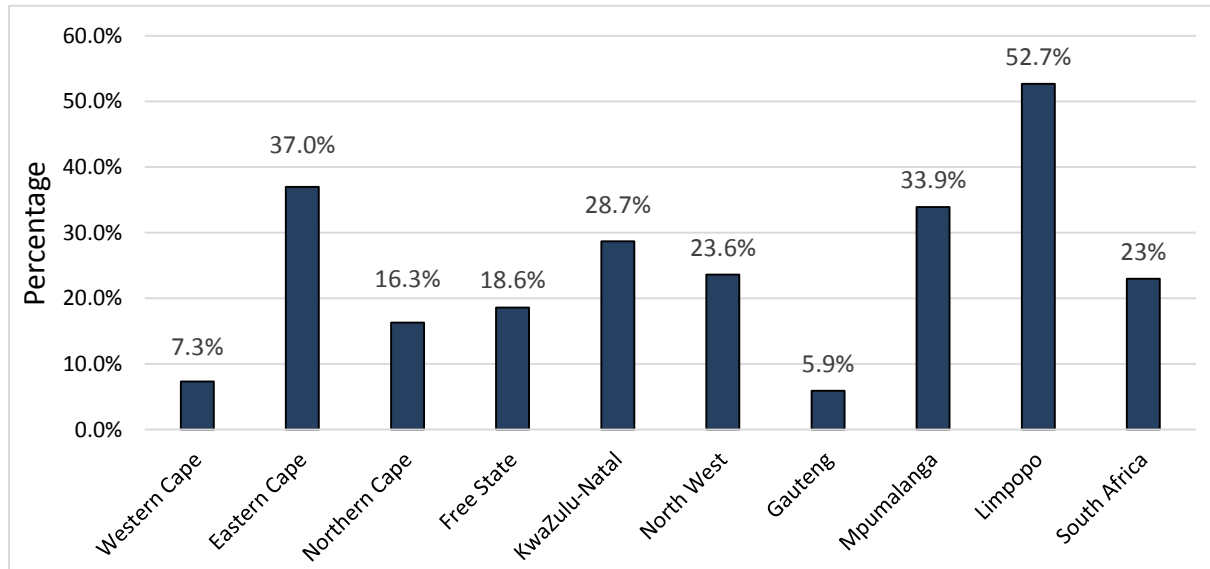


Figure 9. Household involvement in agricultural activities, including the participation for leisure purposes, in South Africa, by province (Stats SA, 2012b).

When it comes to issues of food insecurity in urban areas, calls for enhanced understanding of the role of communities in urban agriculture have been made (Battersby, 2015a). The government has programmes in place where seeds are provided and workshops run to encourage more people into urban agriculture (Battersby *et al.*, 2015a). With this being said, South Africa still displays a relatively low participation in urban agriculture when compared to other African countries such as Burundi, Cape Verde, Malawi, Mali, Mozambique and Zambia (Turok, 2012). Home gardens are another means of reducing the shock of food insecurity in urban households. However, in some areas, water access is still a privilege; the unpredictability of water availability is detrimental to the management of backyard vegetable gardens in areas such as Tembisa (Ekurhuleni Metropolitan Municipality, 2015).

According to the 2015 Gauteng City Region Observatory Quality of Life study, there was a low prevalence of participation in home gardens in Tembisa, compared to Soshanguve, Bronkhorstspuit and Sebokeng, (GCRO, 2015). The willingness to participate in gardening activities by the youth, who are the majority of residents in Tembisa was another key issue. With regards to growing one's own vegetables a participant was recorded saying:

“Grannies are from the Transkei, so they know about planting, so when they see children suffering they plant. We are from here, we know nothing about planting, we don’t even want to learn how to plant. Grannies they are too strong. The things that they were eating from long time ago to now makes them strong, and we don’t want to eat it” (Lakhani, 2014, p. 79). In essence, growing one’s own food is seen as a task for the elderly, among the younger generation.

The number of households growing their own food in Gauteng has increased by 4% since 2013 (GCRO, 2015). Unfortunately issues of land tenure, the lack of tools and skills to grow food, continue to be a limitation to the production of food at a larger scale in cities (FAO, 2012). The cost of a basic amenity such as water further limits the success of agricultural projects in cities, and polluted urban environments add to this problem (Tibesigwa and Visser, 2015). There is often minimal capacity for growing food in urban spaces, especially where space is involved because they are densely populated and the benefactors of urban agriculture projects are ultimately those who need it the least (Battersby *et al.*, 2015b). Furthermore, urban planners continuously plan for land development with limited demarcation for land to be used for agricultural production, further illustrating structural limitations in planning, for the advancement of urban agriculture (Manyamba *et al.*, 2012).

Urban agriculture needs to be an important part of developmental strategies as a whole, where developmental plans within the city involve spaces and tools needed to achieve the goals of urban agriculture in a sustainable manner, which does not compromise the integrity of the environment any further (Malan, 2015a). Malan mentions that all stakeholders need to be involved in the developments of urban agriculture in order to ensure its success. Currently, there are NGOs that are involved in the development of urban agriculture programmes, however, the issue of lack of land tenure and water access for irrigation (which are hindrances to the success of urban agriculture), remain in the hands of local government, and no clear procedures to gain access to land currently exist (Malan, 2015b). There is a call towards incorporating urban agriculture into the food system, which would shorten the transport chain from farm to market. The success of such a call will be influenced by developmental plans and how urban agriculture may be incorporated into the developmental plan, with adequate inclusion of both the formal and informal markets. Evidence from the *Indaba Zokudla* project in Soweto suggests that where urban agriculture projects are a

success, it takes multiple stakeholders from both public and private sectors together with the farmers. In these cases a bottom-up, approach, which allowed for projects and technologies developed to be relevant in terms of their context, ensured that key issues were addressed whilst building relationships between both the benefactors and the beneficiaries (Malan 2015a; Malan *et al.*, 2015).

In contrast to what has been reported in some parts of Gauteng, urban agriculture has been found to be an advantageous livelihood strategy in the Cape flats, through increasing the ability of the women from the Cape flats to provide for their family (Olivier and Heinecken, 2017). In addition, these women were able to increase the diversity of the food consumed in their households. In areas such as the Cape flats, urban agriculture did not only significantly increase the quality of the diets, but also had the added benefits of allowing women- who are more at risk to food insecurity – the benefit of building social networks and improving social cohesion within the local community and amongst their fellow cultivators (Olivier and Heinecken, 2017).

2.7.3 Social security and its role in the fight against food insecurity in South Africa.

Social security also directly impacts food security, and efforts have been made by the state to enhance the social security of South African households. According to the Department of Social Development, 44.8 % of South African households benefit from social welfare grants. Out of approximately 14.5 million households which make up the South African population, 6.49 million households are receiving some kind of social grant from the state (Statistics South Africa 2016). Approximately R143.9 billion was spent on social protection programmes, and this number is expected rise to R 209.1 billion between 2019/2020 (Stats SA, 2017). The grants range between R350 and R1600, where 61.3% of South African households are supported by the R350 monthly stipend from the child grants. Despite this being a large number of households receiving grants, a large proportion of food insecure households that qualify to receive grants, have no access to these grants, which would notably increase the instances of hunger experienced in these households (Altman *et al.*, 2009).

The national school feeding scheme, also the brainchild of the Department of Social Development has proven to be integral in the role it plays towards the advancement of child

nutrition in South Africa. The United Nations Development Plan (2016) discovered that not only have the school-feeding schemes guaranteed children in crèche to higher education a nutritious meal, but they also aid in social capital, by building the child through education. It was also found that more children were found attending schools in areas where the National School Feeding scheme was introduced. In a study by Statistics SA (2017) it was further emphasised that uneducated individuals have a higher likelihood of being unemployed for a longer period when compared to the individual with some form of formal education (Figure 10). Such evidence further emphasises the importance of keeping children in school and ensuring that they are in the best condition to learn, through the provision of a nutritious filling meal, which ultimately works towards combatting the vicious cycle or poverty in our society.

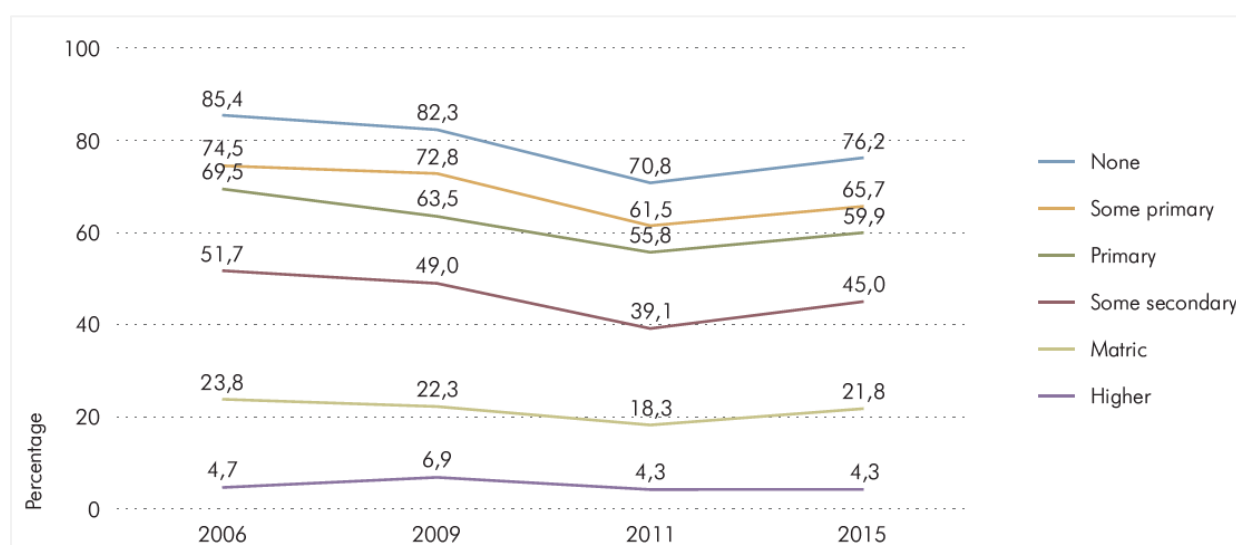


Figure 10. The relationship between poverty and education as observed over a period of 10 years in South Africa. Education levels are indirectly proportional to poverty levels of individuals (Stats SA, 2017).

The Gauteng DSD reached 66 000 households through their food distribution strategy, however, this was a temporary measure. Currently their goal is to reduce inadequate access to food to no more than 10% of the population and ensure that no more than 5% of the Gauteng population experience hunger (GDARD, 2011).

What is different about households in cities like Johannesburg is that they are found in the central economy node for SADC countries where many individuals migrate to, with the hopes of getting employed and to some extent providing for their families in different

countries and different provinces. These households exhibit fewer food transfers and remittance, unlike those residing in other provinces and countries. This further limits the coping strategies of the urban poor (Frayne *et al.*, 2010).

2.8 The Food supply chain.

The South African food market, is subject to what is called a free-market system, this allows for those in the production-chain to trade and control food prices as they please. Because the food goes through various steps before it reaches the consumer, each participant in the food value chain places value on their product and by the time the food reaches households, the value has increased greatly from its raw stage, to its packaged stage.

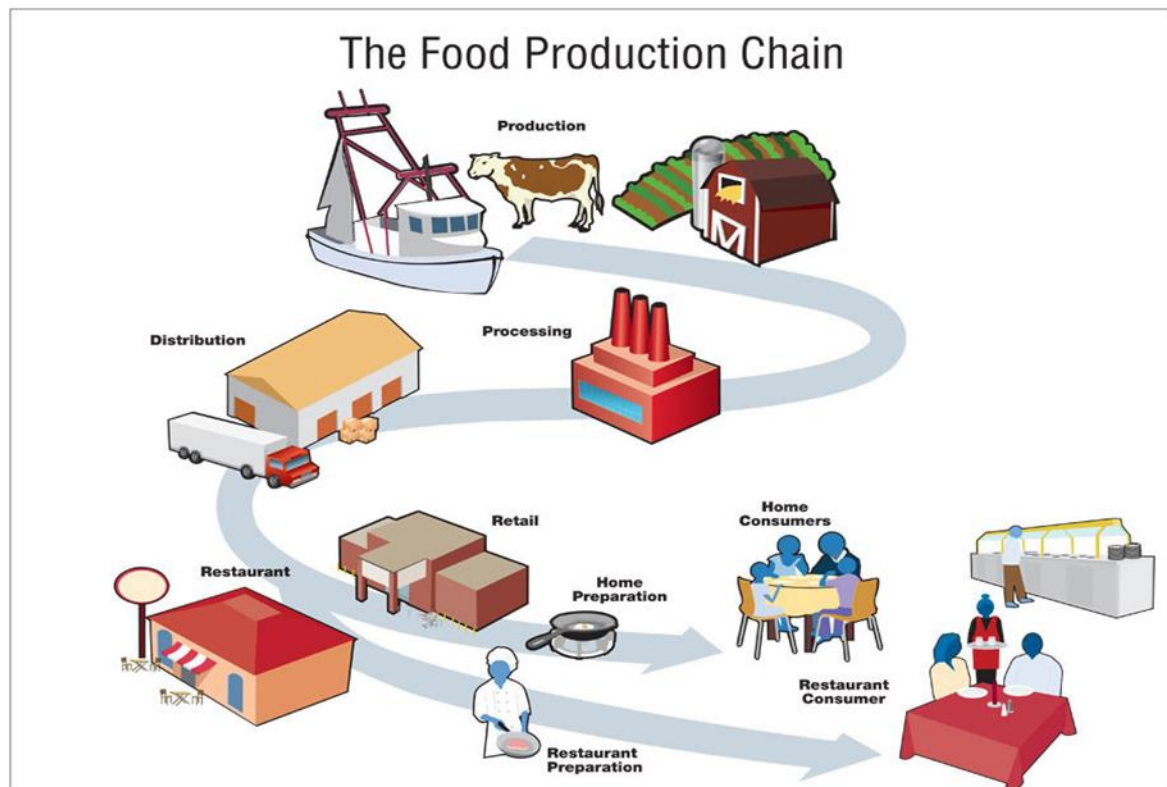


Figure 11. A breakdown of the food value chain (Centers for Disease Control and Prevention, 2013).

There are five main stages in the food chain, namely food production, processing, packaging and distribution, retailing and consumption (Figure 11). Although distribution is mentioned as a single step with packaging, it is in fact a step which happens between each stage in the food chain (Figure 11). Production in South Africa is mainly in the hands of farmers, where primary production of the raw unprocessed material occurs.

This is followed by the processing stage where food is processed, refined, preserved and prepared from its raw state into its desired state. This food is then packaged, branded and sold to retail outlets, where it will finally be bought by households (Figure 11). However, often before they reach retail outlets, the retail outlets often buy certain brands from wholesalers. The cost of food is not only affected by what happens at a national level in South Africa, but also by factors such as the global fuel and oil prices at any specific point in time. Both these national and international factors are affecting food prices, these results in great difficulty when assessing drivers of food price changes (Kroll, 2016). The structure of the formal market means that instability which may affect food prices in different continents may be felt equally if not more, by South Africans (Drimie and Gillespie, 2010).

The food chain ultimately plays an integral role in the status of food security, however, since the deregulation of the food system, it has become even more difficult to determine drivers and nodes of food price increase along the food system. Stakeholders have become less transparent, limiting the quality of information which can be gathered from the food chain, making it a difficult task to determine the location of power along the food value chain as it would assist in determining those responsible for shaping the market (Battersby *et al.*, 2015b; Kroll, 2016). The South African formal food market is made up of a few dominant companies, which play a leading role in providing the majority of the population with the food they consume on a daily basis. These companies are all private and base their prices on profit-gain, because their obligations to local communities are limited.

2.8.1 Informal markets

Consumer patterns are highly affected by the type of employment and means of income generation. The urban poor rely on informal employment and make use of the informal markets on a daily basis (Peyton *et al.*, 2015; De Zeeuwel *et al.*, 2011). Informal retail outlets such as *spaza* shops and vegetable markets have been viewed as key contributors to urban poor household food security. The importance of informal markets amongst low-income urban household has been attributed to the pricing of the food and the quantity of the food sold (De Haan *et al.*, 2000; Peyton *et al.*, 2015). Unlike formal retail outlets, informal retail outlets tend to sell goods to the local community at smaller manageable volumes, which would otherwise not be affordable if they were purchased at the larger quantities under formal retailing (Peyton *et al.*, 2015; Battersby and McLachlan 2013). In addition to the

quantities that food is sold in, the, informal shopping outlets are often more accessible to local communities, not just spatially but temporally. Markets such as *spaza* shops stay open for longer hours than formal retailers, and often they have a good understanding of the needs of their community and cater for their direct needs.

Spaza shops act as safety nets for low-income urban households in times of need as they often allow their customers to take food on credit, and afford them the chance to acquire food when they lack the resources to do so (Battersby, 2011b). In Cape Town, many informal retail markets have been known to sell their food to their customers on credit, however this only exists in spaces where strong consumer-provider relations have been established. Sadly even though they play a crucial role in maintaining the resilience of low-income urban households, the informal economy is often discriminated against, with some owners losing their stock as a result of this discrimination. Informal markets do not only cater to the consumer, but also the provider, often the people running these stores have done so as a means of coping with the lack of formal employment (Battersby 2011b).

As this review has shown, food insecurity in South Africa's urban spaces is a complex problem to address. With that being said, there is a continued need for comprehensive research on the intricacies of urban food insecurity. Although this study alone cannot determine each driver of urban food insecurity within South Africa, the insight acquired from this study is important in solidifying our knowledge on the urban food security problem and further insuring that appropriate policies are in place to address the subject of food security as a whole.

3. Chapter three: Materials and methods

3.1 Study Site

Tembisa (GPS coordinates: 26.0106 S, 28.2219 E) is a township situated in the North East of Johannesburg, with an estimated population of 463 109 (Figure 12; Stats SA, 2011). The township was established in 1957 during a time when black South Africans were forcibly removed from their homes in areas such as Alexandra, Edenvale and Germiston. Tembisa falls under the Ekurhuleni Metropolitan Municipality, which encompasses all of Kempton Park. The area (Tembisa) is home to 166 340 households, of which 27.1% are female-headed.

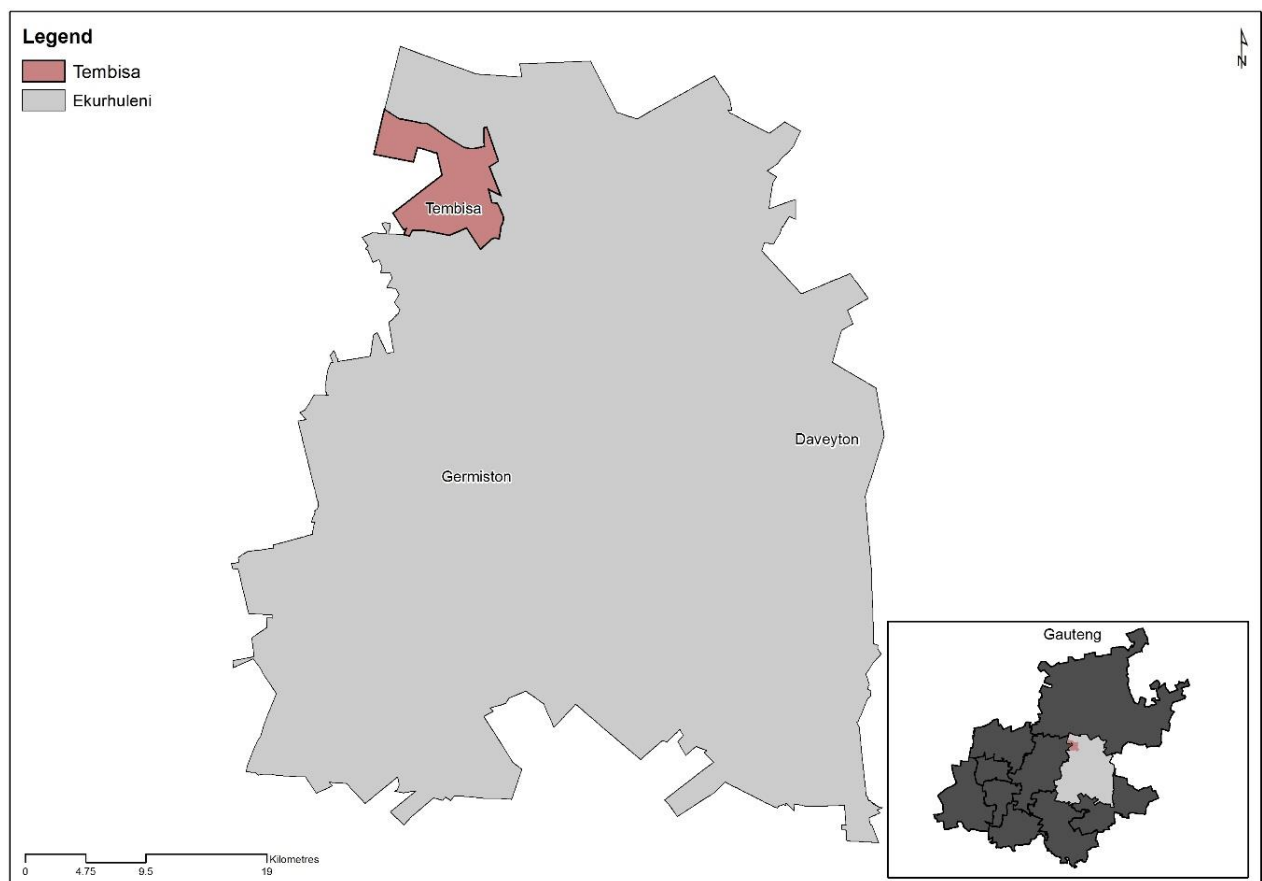


Figure 12. The location of Tembisa in Gauteng, under Ekurhuleni Metropolitan Municipality, indicated by the area shaded in pink.

The dominant languages spoken in Tembisa are Sepedi, IsiZulu and Xitsonga (33.14%, 21.67%, and 13.31 % respectively). The township is far removed from where job opportunities lie and is further characterised as a low-income area with higher unemployment rates than Katlehong another large township governed by Ekurhuleni Metropolitan Municipality (EMM) (Stats SA, 2012b). Only a small proportion of the residents in the area

have had higher education training, with a large proportion only reaching the matriculation stage of their education (Figure 13).

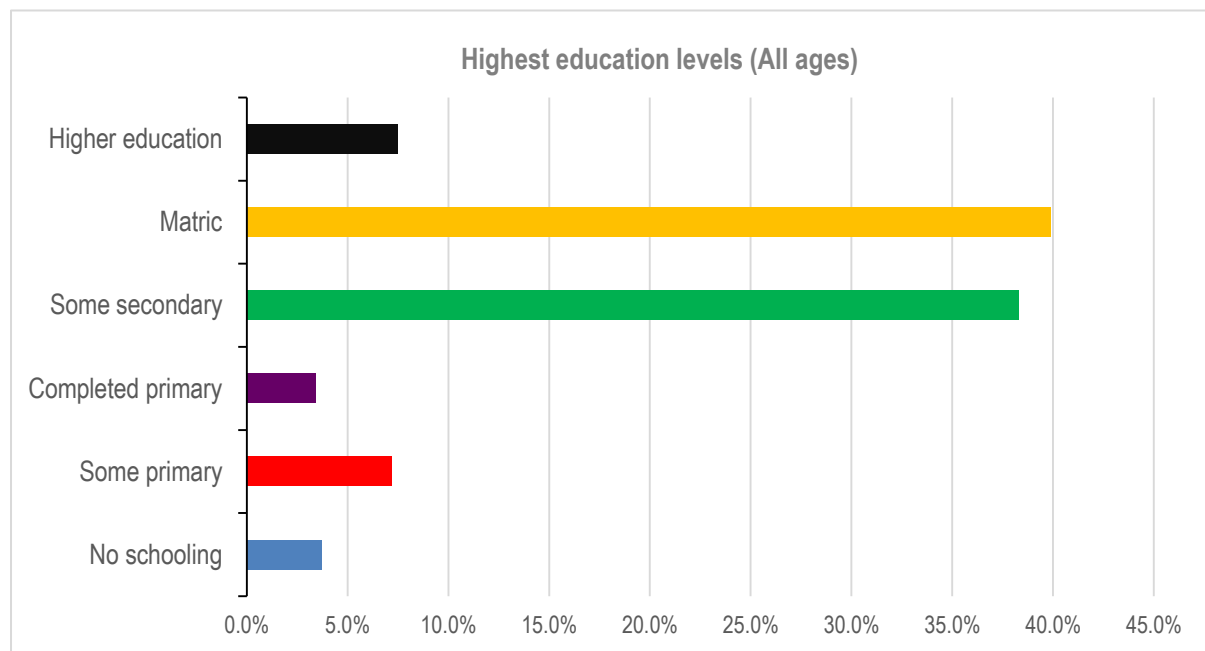


Figure 13. Overall education levels of the Tembisa population with many of the Tembisa population having some secondary and matric education (Stats SA, 2011).

There is a larger influx of migrants from within and outside South Africa into the township in search of job opportunities compared to large townships in Johannesburg such as Soweto and Katlehong (Stats SA, 2012b). Development in Tembisa has been slow to catch-up with the rest of Johannesburg and, issues with sewerage construction and water security remain persistent in the community (Ekurhuleni Metropolitan Municipality, 2015).

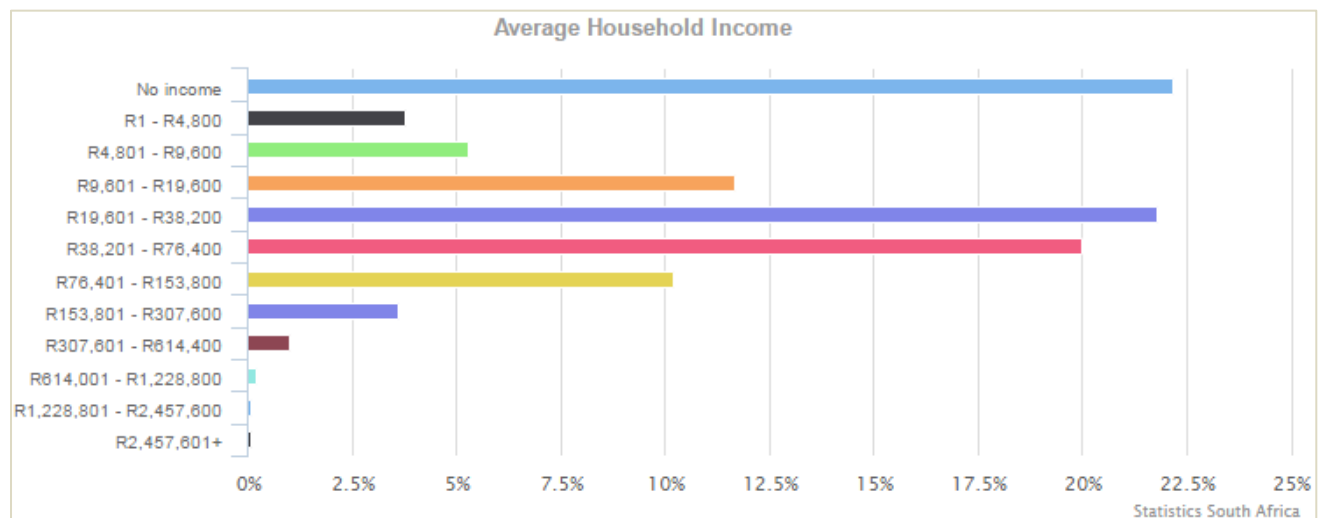


Figure 14. The average household annual income of Tembisa residence (Stats SA, 2011).

Large numbers (63.9%) of the population in Tembisa have no access to running water in their homes, and almost 20% of the households do not have access to electricity (Stats SA, 2012b). However, in Soweto, the largest township in South Africa, more than half (55%) of the population has access to running water within their yards and less than 10% of the population have no access to electricity. Issues of running water and access to electricity are crucial in the utilization of foods, as they may lead to poor sanitation and a reduced shelf life of the foods being consumed due to unavailability of storage facilities such as refrigerators. A large proportion of the population continue to live off of low incomes (Figure 14). Although urban agriculture could be seen as a solution to issues of food security in Tembisa, land that is suitable for agricultural development is situated outside Tembisa. Soils in Tembisa are of low quality, have low moisture availability and are not good for growing crops (Ekurhuleni Metropolitan Municipality, 2015).

Few studies have been conducted to evaluate the levels of food security within Tembisa, even though EMM was amongst one of the municipalities (Figure 15) which were recognised to host a large proportion of the seriously hungry urban households (Battersby *et al.*, 2015b). Drivers of food security at a finer scale are an important aspect to take note of, as the knowledge allows for interventions that are directed at the key threats to food security. There is a knowledge gap in this aspect, and although there is some knowledge on the interventions introduced by the community with regard to food insecurity alleviation, there is little knowledge on whether the interventions are targeted at the main drivers or constraints of food security within Tembisa.

The fulfilment of the SDG 2 in South African townships is vital for the development of South Africa as a whole. The current socio-economic status of Tembisa (Figure 15) makes it a key area to consider with regards to studies on food security, its drivers and the households affected. This study will add to existing knowledge with regards to food security in South African Townships. Having contacted the municipality I was advised that Ethafeni, Teanong and Temong are the three sub-places within Tembisa which are most representative of Tembisa in terms of employment and education levels. These are the sites used for this study (Figure 15; K. Nenguda *pers.comm*, 2016).

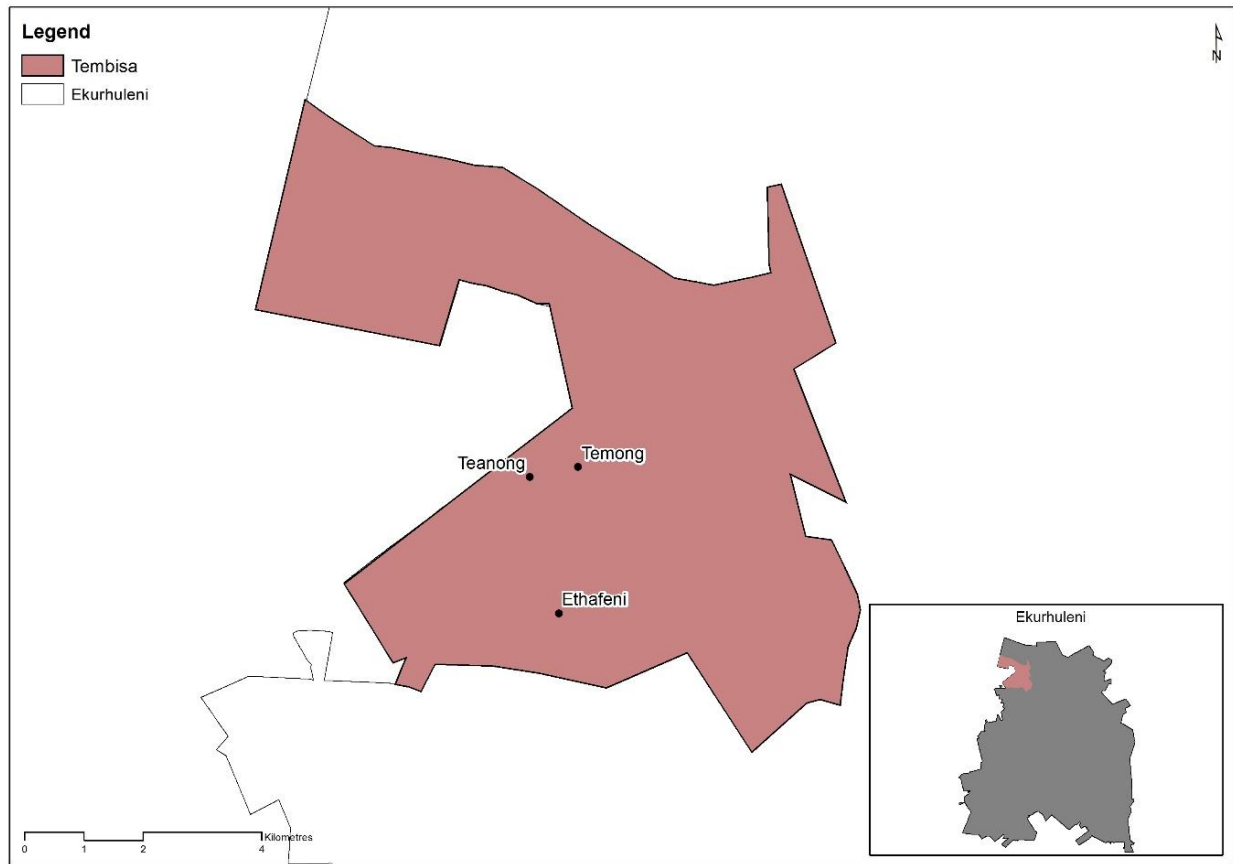


Figure 15. Location of the study sites situated in Tembisa indicated within the pink area. The three study sites are Ethafeni, Teanong and Temong.

3.2 Sampling design

3.2.1 Household Interviews

An interview questionnaire was developed in line with objectives of the research. The final result was a semi-structured interview questionnaire for the household interviews. The questionnaire was made up of socio-demographic questions, questions on shopping practices, coping strategies in light of food shortages and spending habits. The Household Food Security Index Access Scale (HFIAS) and the Household Dietary Diversity Scale (HDDS) Index which were developed by Food and Nutrition Technical Assistance Programme of the USAID, were used as a means of determining Food and Nutrition security respectively (Appendix 1; Swindale and Bilinsky, 2006; Coates *et al.* 2007). The HFIAS is a tool that takes into account the changes of food security levels over time and enables one to note the different stages households go through before experiencing chronic food insecurity (Castell *et al.*, 2015). This HFIAS is also a good measure of the levels of food security that different

people may be experiencing at the same point in time, thus enabling the proper evaluation of the state of household food security. When compared with other tools (CSI, rCSI, FCS and HHS) it was found that the HFIAS measured more food security related factors such as stability, quality, quantity and acceptability of food consumed whereas the other tools only measured two of these factors, making the HFIAS a more suitable tool for the purpose of this study (Maxwell *et al.*, 2013). It was further established that, the HFIAS is more informative when used in conjunction with other tools such as the HDDS (Maxwell *et al.*, 2013).

The HDDS was measured using a 24-hour recall of the number of food groups consumed by household members; this measure is made up of 12 food groups.

Interviews were undertaken between 15 August and 30 September 2016. They were conducted with participants over 18 years of age. In order to maintain anonymity each participant was given a number which followed the first three letters that made up the name of their suburb e.g. the first participant from Teanong would be referred to as 'TEA 1'. Snow-ball sampling (where future interview participants are recruited from the acquaintances of those being currently interviewed) was used as method of securing interviews with Tembisa households. Referrals to customers of *spaza* shop owners were also used to select potential candidates for interviews, and customers were approached for interviews as they were shopping at the *spaza* shop. Each participant was notified of their right to refuse to be interviewed or answer questions they found uncomfortable. In total, 140 households were interviewed in Teanong (50), Temong (40) and Ethafeni (50).

3.2.2 Market monitoring: Formal and informal

Food-stuff brands and quantities to be monitored were determined with the help from a key informant from the study areas and based on previous food price surveys conducted in South Africa, which made use of the similar products (Statistics SA, 2013). The price data were collected on a monthly basis from 3 of the most popular supermarkets in the area over a period of 6 months. The popularity of these supermarkets was determined during household interviews where each household was questioned on where they bought their food from. In addition to the 3 supermarkets, 12 *spaza* shops (4 in each site) and one vegetable\fruit (street vendors) market with a series of stalls was also used to monitor food prices. Both formal and informal markets were monitored in this study since most participants made use of one of the

two markets on a daily basis. The purpose behind this was to investigate differences in food pricing, volatility and quality being sold in the formal and informal markets.

3.2.3 Assessing the drivers of food prices

In this section, sales representatives or store managers were asked to rate the most prominent driver of food price increases in their store (Appendix 2) by giving a score between 1 and 5. Where 1 was the least prominent driver and 5 was the most prominent driver of food price increases. This exercise was used to determine the key factors contributing to food price hikes in Tembisa, without having to consider the entire food system, which is complex and is not possible to do due to the time constraints of this project. The information gathered from this exercise was also crucial for understanding where the impact of drought lies within the recent food price hikes.

3.2.4 The living standard measure

The living standard measure (LSM), which assesses access to physical assets was used as a basis for measuring household wealth. The LSM has been used as a measure of wealth in the marketing industry more especially through online surveys. Although up to 30 assets can be used as a measure of wealth, in this study the list was scaled down to 10 assets. The total LSM (based on the sum of the available 10 assets) score was used to differentiate between the lower LSM (from 1-5) and the higher LSM group (score of 6+). The assumption is that the households with the lower LSM are “poor” whilst those with the higher LSM are the “wealthier” households.

3.3 Data analyses

The data were entered at the University of the Witwatersrand for further analysing using, the data were then prepared for analysis using Microsoft Excel 2013 and SPSS for Windows version 22 (SPSS Inc., Chicago, Illinois). Descriptive statistics, One-way Anova, Chi-squared tests and the Fisher exact tests were the methods used for data analyses.

3.3.1 Household surveys -HFIAS and HDDS

The HFIAS score was calculated based on the frequency of occurrences of “yes” answers. The higher the score, the more severe the level of food insecurity in the household was. Households were then grouped into the four categories of food insecurity, namely: severely; moderately; mildly food insecure and food secure (Appendix 1).

The HDDS which is made up of 12 food groups was used to measure the nutritional diversity of food, individuals are consuming in urban households (Appendix 1). All foods mentioned should have been prepared or consumed inside the home. If not, it may have resulted in an over-estimation of the household’s dietary diversity. The 12 food groups consisted of (1) cereals, (2) legumes, (3) roots/ tubers, (4) meats, (5) eggs, (6) fruits, (7) vegetables, (8) fish, (9) milk, (10) fats, (11) sugar and (12) a miscellaneous group which was made up of beverages such as tea and coffee. The questionnaire was coded 0 for “no” or 1 for “yes”. The score for each household ranged between 0 and 12, and by summing up the number of food groups which were consumed the dietary diversity scores for each household were calculated using the following formula:

HDDS (0-12)	Total number of food groups consumed by members of the household. Values for A through L will be either “0” or “1”. Sum (A + B + C + D + E + F + G + H + I + J + K + L)
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The average HDDS was then calculated for each sample population, using the following formula:

$$\text{Average HDDS} = \frac{\text{Sum (HDDS)}}{\text{Total Number of Households}}$$

The proportion of households or individuals consuming fruits and vegetables were derived from the HDDS score. Descriptive statistics including frequencies and percentages for categorical data, means, and percentiles for continuous data were calculated. Statistical Chi-square tests were used to analyse demographic data collected from the interviews.

3.3.2 Consumer Price Index and food price volatility

The Consumer Price Index (CPI) data were downloaded from the Statistics South Africa database and used to map the relationship between CPI and food access between September 2013 and September 2016. The variation of food prices that were collected between December 2016 and May 2017 was computed as the standard deviation of the deviations from the trend over the previous 6 months.

3.3.3 Ethical consideration

A study of this nature requires the participation of people from Tembisa and responses to questions that some may view as highly sensitive. All the materials and methods used for the research were reviewed by the Human Research Ethics Committee (non-medical) of the University of the Witwatersrand and ethics approval was granted for this study.

4. Chapter four: Results

In this chapter, results are divided into 2 sections. In section 1, an understanding of the food security status of the respondent participants in the households in Tembisa is articulated. Key trends observed, when food security is linked with other factors including household characteristics are presented. The dietary behaviours of the participant households are provided. A central aim of the study is to understand the factors that may be driving households towards or away from a state of food security. In the last section the findings from surveys conducted in formal and informal markets are presented, as well as information pertaining to additional observations which may have been made during the duration of the study and insight into interventions which have been central to decreasing the communities' vulnerability to food insecurity.

The data presented are based on interviews conducted with 140 households within the three study sites, and data collected from 20 shops (formal and informal) located within and around the study site.

4.1 Socio-demographic profiles

This study aimed to gain a representation of what is going on amongst Tembisa households with regards to issues of food security. In order to do so, we opted to identify three areas that were most representative of the large township as a whole, without being biased to highly advantaged or highly disadvantaged areas of Tembisa. With regards to the data, it was analysed as disaggregated data to assess any patterns that may arise, and any differences that may exist from the most prominent factors found to be crucial in driving food insecurity in Tembisa. Hereafter, we found no significant difference between five of the six factors found to be key drivers of food insecurity in the three areas (Appendix 3). The factor showing a difference were the changes in income in the past year where Teanong was found to have a significantly higher number of households with an increased income in the past year. Teanong further showed fewer households receiving grants and higher numbers of food

secure households with dietary diversity above six, these additional factors were however not significantly different between the sites (Appendix 3).

Herein represented are the aggregate data of the three sites that were reported to be most representative of Tembisa -Temong, Teanong and Ethafeni. These are presented combined with the purpose of fulfilling the aim of the study, which is to better understand the underlying factors responsible for the state of urban household food security in Tembisa.

Almost half of the participants interviewed lived in formal housing (41.7%) and were between 18-28 years old (Table 1). The distribution between males and females was slightly skewed, with a sample that had more female (54.3%) than male (45.7%) participants (Table 1). A large proportion (60.7%) of the households sampled had lived in Tembisa for over 10 years, and 46.4% of the households received some sort of social grant from the South African government (Table 1). The majority of the households interviewed were made up of 1-3 members, and 46.4% of the participants were formally employed (Table 1).

Table 1. Summary demographic data of the study sample of 140 households in Tembisa.

Age (years)	18-28	29-39	40-49	50+
	41%	31%	10%	19%
Housing type	RDP	Shack	Backroom	House
	6%	3%	34%	56%
Duration of stay (year/s)	1-5	6-10	10+	
	30%	9%	61%	
HH size	1-3	4-6	7+	
	49%	38%	14%	
Gender	Female	Male		
	54%	46%		

4.2 Household Food-security

From the interviews conducted within the three sites it was evident that household food insecurity and vulnerability to food insecurity was prevalent within the representative households. Out of the 140 households sampled, only 24% were characterised as 'food secure', based on a recall of food consumed in the past 24 hours, leaving 76% of the interviewed households to be characterised as 'food insecure' (Figure 16). This was determined using the Household Food Insecurity Access Scale (HFIAS index), and makes use of observations in changed behaviours and attitudes as a means of determining food security within households. A decrease in the amount and quality of food consumed and a heightened worry about food availability were amongst the behavioural and attitude changes conveyed.

A concerning number of households fell into the 'severe' (31%) and 'moderate' (41%) levels of food insecurity (Figure 16). At these levels, household members resort to skipping meals, and eating less, even to the point of not eating for a full day due to lack of resources. In many of the interviews the participants commented on how they had shifted from eating 3 times in a day to eating twice a day. One of the more severe cases was where a participant over 50 years of age stated that sometimes when there is no food, he would just drink water and go to sleep.

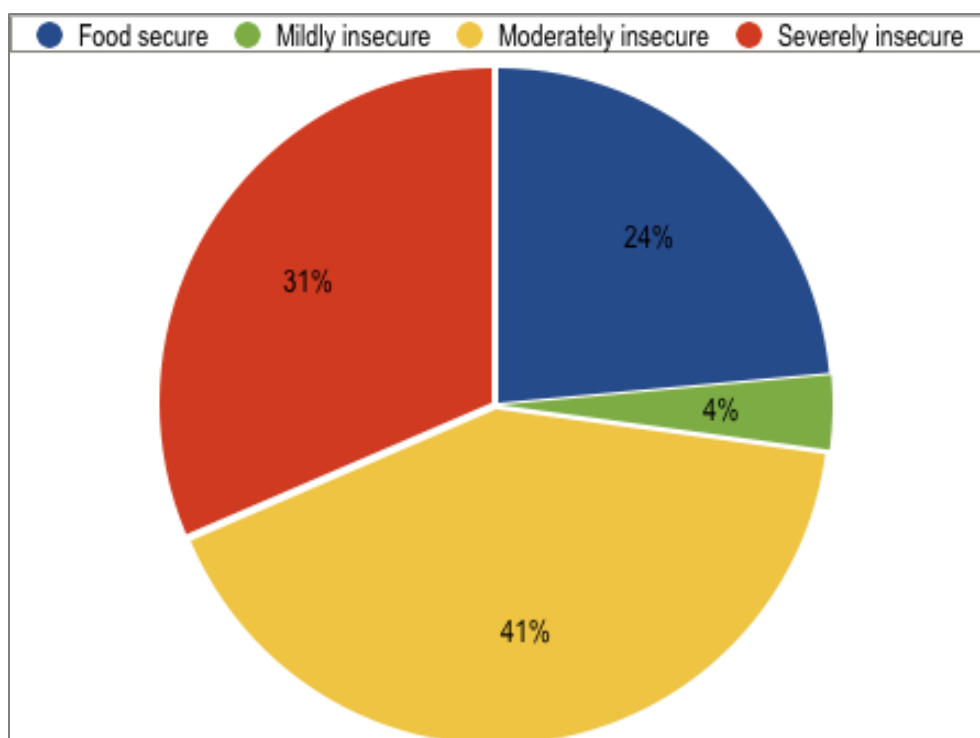


Figure 16. The distribution of different levels of food security in Tembisa based on the HFIAS index. Where food security levels are categorised into four levels starting from the least vulnerability to high vulnerability; food secure to severely food insecure.

4.3 Household Dietary Diversity

Due to the lack of resources such as money, most households were forced to shift from a higher quality diet to a lower quality diet during the 2015/2016 period. An average HDDS score of 4.35 (Figure 18) was observed with a large proportion of the population falling within the moderately food insecure category. The majority of the households sampled scored between the 4-6 category for dietary diversity, whilst only a few households fell into the extremes HDDS margins (0, 10-12) (Figure 18).

More than 50% of the 'severely food insecure' households had a Dietary Diversity score which fell below 4, which is reasonably low. A small percentage (only 9%) of the 'food secure' households had a Dietary Diversity Score below 4, whilst a large proportion of the 'food secure' households did not score below 4. Surprisingly, one respondent from the 'severely food insecure' household scored HDDS between 7-9, this is relatively high when considering that the respondent had an affirmative response to questions about having skipped meals and gone to bed hungry in the past month due to lack of food and resources

needed to acquire food. Chi-square indicates a significant association between the HDDS and the level of food security χ^2 (12, N = 140) = 26.594, P < 0.01. It was quite evident that dietary diversity was a matter of concern within the participants' households, where some households would consume unhealthy staples several times in a week. During interviews researchers came across a lady who sold *spahlo/kota* for a living. This meal comprises of a quarter loaf of white bread, slap chips (oil-soaked deep-fried chips), polony and cheese, depending on how much money a customer is willing to spend, and is a food that is frequently consumed within the township (Figure 17).



Figure 17. A basic South African spahlo/kota, stuffed with slap chips, cheese and fried polony.

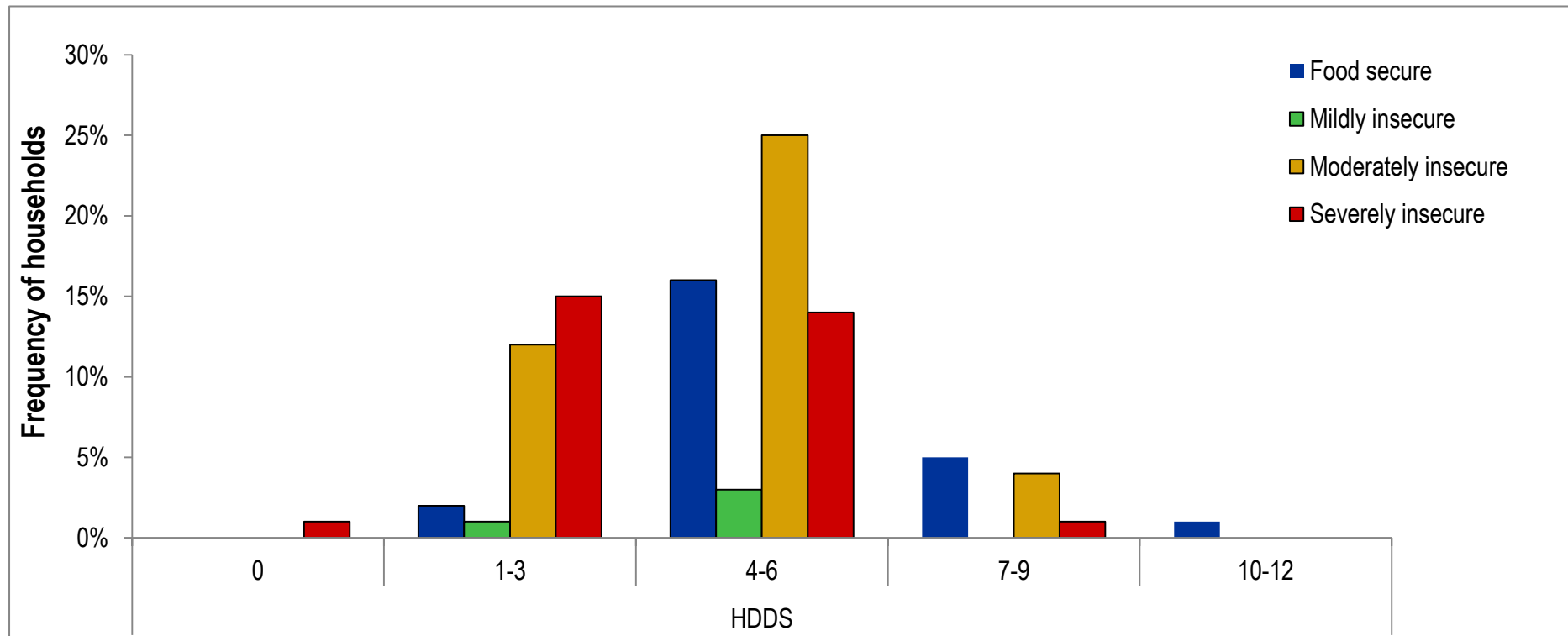


Figure 18. Household Dietary Diversity Score (HDDS) between 0 and 12 in relation to the Household Food Security Access Scale (HFIAS).

When the lady was asked to recall her meals from the past 24 hours, she referred to how she ate *slap chips* (oil-soaked deep-fried chips) and bread all week with her children because they could not afford to have variety in their diet, therefore they only ate what the lady sold in her shop.

Consumption of either sour milk and porridge or porridge and cabbage was said to be the everyday food, in cases where households did not have money to procure other food-stuffs. Redsondient TEM 36 was recorded saying: “We eat to get full, not to enjoy.” Often when respondents had access to vegetables, it was cabbage, onions or tomatoes. Cabbage was bought by many households based on its affordability and the fact that a head of cabbage was usually enough to feed a whole family more than once. Others referred to the consumption of cabbage and pap as the “poor persons food”.

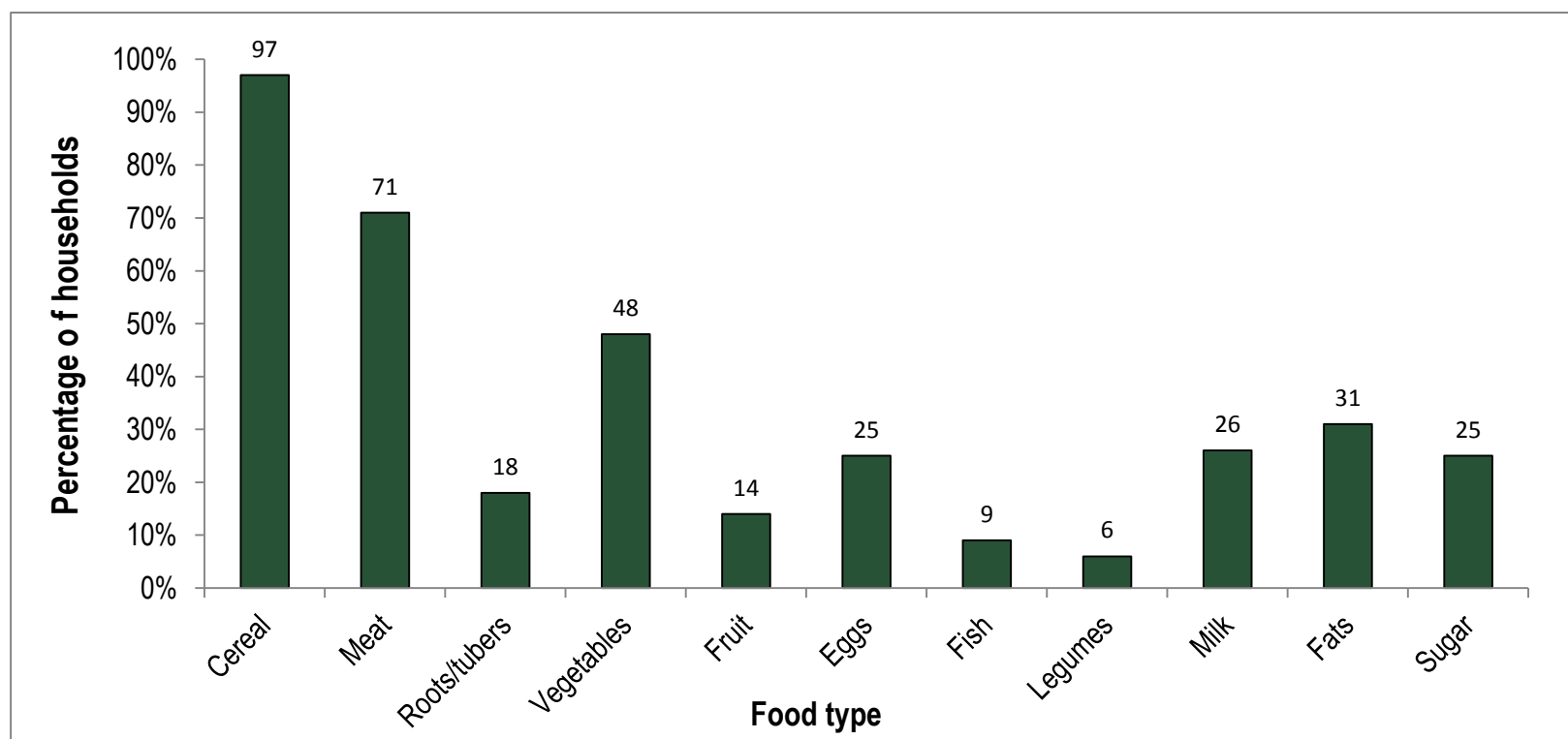


Figure 19. Food consumption of 138 households over a 24-hour period. Cereals = maize, rice, wheat or bread. Legumes = Foods made from beans, peas, lentils or nuts.

The percentage of households recalling eating fruit in the past 24 hours was extremely low (13%), and when most households were asked why they did not consume fruit, respondent ET 20 said: “I cannot buy fruit; they are not a priority, because you cannot feed the whole family with fruit.” One other participant implied that fruit is too expensive and is mainly for people with money, this explains why there was a higher percentage (21%) of food secure households, that tend to have more money to spend on food, consuming fruit compared to food insecure (9.8%) households (Figure 19). Approximately 97% of the households were reported to have eaten food-stuffs made from cereal (starch staples) in the past 24 hours. The most consumed food types were cereal, meat and vegetables. The least consumed foods were legumes, fish and fruit, in their respective ascending order (Figure 19). It was also interesting to find that meat was the second-most consumed food group given the cost implications for low income households.

4.4 Household characteristics and food security

A statistically significant association $\chi^2 (6, N = 140) = 13.135, p < 0.05$ was observed between food security and job sector. It was clear that a relationship exists between the job sector that the breadwinner works in and food security, however, this relationship was more visible at certain levels of food security (namely food secure and severely food insecure). The participants living off formal income experienced higher levels of food security than those with informal income (Table 2). Severe cases of food insecurity were reported by more households with unemployed breadwinners and also households relying on informal income (Table 2). There seemed to be some confusion between employment and unemployment, where most individuals who were earning a living from the informal sector would categorise themselves as “unemployed”, this error was corrected for in the analyses through reclassification of data. Those previously classified as unemployed whilst working in the informal sector were reclassified under the same banner as those with full time formal employment. Before the reclassification more than 50% of the households were classified as unemployed. After reclassification, only 12% of the households constituted of family heads which were unemployed. In total, 39% of the ‘employed’ households worked in the informal sector and the remainder were formally employed.

Households where tenants were not renting had more severe cases of food insecurity than household where tenants were renting, when the data were further explored we found a strong association between household size and renting versus non-renting tenants $\chi^2 (6, N = 140) = 60.742, p < 0.001$. On average, renting tenants tended to have fewer household members than non-renting tenants which may explain the higher prevalence of food insecurity amongst non-renting tenants. Older participants in the study (above 40 years) displayed a higher severity of food insecurity than the younger participants (Table 2). The results display an association between the age of the participants and food security $\chi^2 (9, N = 140) = 17.196, p < 0.05$.

Some households relied not only on income from a parent, but also from child grants and grandparent's pensions. Those receiving grants would be expected to have higher levels of food security because of the additional source of income. However, it is the households receiving grants which experienced higher proportions of food insecurity and even more severe levels of food insecurity $\chi^2 (3, N = 140) = 4.321, p > 0.05$ (Table 2).

Table 2. Summary statistics of the relationship between household food security status (based on Household Food Insecurity Access Scale) and demographic data of the study population, using the Chi-square statistical test.

		Level of food (in)security				<i>p</i> -value
Trait		Food secure % (<i>n</i> =33)	Mild % (<i>n</i> =5)	Moderate % (<i>n</i> = 58)	Severe % (<i>n</i> = 44)	
Job sector	Formal	30.8	4.6	41.5	23.1	0.041
	Informal	20.7	3.4	44.8	31	
	Unemployed	5.9	0	29.4	64.7	
Gender	Male	28.1	4.7	35.9	31.3	0.519
	Female	19.7	2.6	46.1	31.6	
Renting	Yes	32.7	1.8	38.2	27.3	0.209
	No	17.7	4.7	43.5	34.1	
Age	18-28	38.6	3.5	36.8	21.1	0.047
	29-39	14	4.6	48.8	32.6	
	40-49	7.1	7.1	42.9	42.9	
	50+	15.4	0	38.5	46.1	
Household Size	1-3	27.9	3	41.2	27.9	0.707
	4-6	18.9	5.7	37.7	37.7	
	7+	21.1	0	52.6	26.3	
Government grant	Yes	16.9	3.1	41.5	38.5	0.236
	No	29.3	4	41.3	25.3	
Housing type	RDP	0	11.1	33.3	55.6	0.172
	Shack	0	0	75	25	
	Back room	35.4	2.1	37.5	25	
	House	20.3	3.8	43	32.9	
Duration of stay	1-5	28.6	0	42.8	28.6	0.574
	6-10	30.8	7.7	38.5	23	
	10+	20	4.7	41.2	34.1	
Number of breadwinners	1	22.1	3.2	42.1	32.6	0.632
	2	23.1	5.1	38.5	33.3	
	3	60	0	40	0	
	4+	0	0	100	0	
Total income on food	Less than a quarter	50	0	25	25	0.155
	Quarter	30.2	7.6	39.6	22.6	
	Half	11.8	2.9	52.9	32.4	
	More than a half	16.1	0	41.9	41.9	

As the number of breadwinners increased in a household, there was a decrease in the severe cases of food insecurity. However, there was no significant association between the household size and the level of security $\chi^2 (6, N = 140) = 4.875, p > 0.05$. Approximately 46.4% of the households interviewed spend between half and more than half of their gross income on food, in cases where participants spent half or more than half of their total income on food, there were increased instances of food insecurity (Table 2). However, when the relationship between food security and total income spent on food was tested it was found to have no statistical significant association $\chi^2 (9, N = 126) = 14.583, p > 0.05$ (Table 2).

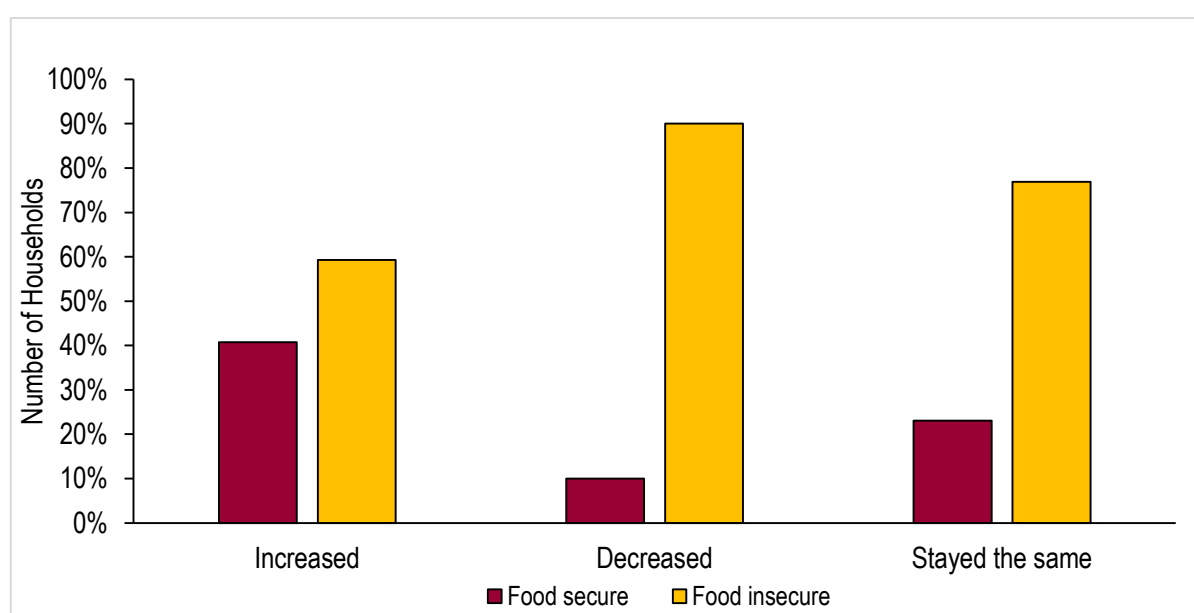


Figure 20. The relationship between wage changes within the past year and food security. Where the 'food secure' category is a combination of 'mildly food insecure' and 'food secure' households.

Households with decreased income experienced the highest level of food insecurity (90%), followed by households whose income had not changed in the past year (77%) (Figure 20). Although households which received wage increases had the highest prevalence of food security (41%) from the three groups, there were still a high number of food insecurity reports in these households (59%) (Figure 20). When the individuals were asked whether the increased pay was helpful, in bettering the households' food access, almost half (48%), of the respondents perceived the wage increase as unhelpful, when asked why

participants commented on how food prices had also increased and how their wage increase could not compete with the rise of food prices.

4.5 The living standard of participant households

At face value it seems as though the level of food insecurity had no relationship with the Living Standard Measure (LSM) score. However, once the proportion within each food security level was considered it was evident that the difference between low and high LSM in those falling under the 'food secure' category was great. The average LSM was 6.27 and approximately 83% of the food secure households fell into the high LSM category (Figure 21). Households falling under moderate and severe levels of food insecurity had higher proportions (38% and 36% respectively) of people in the low LSM category, which was more than double the proportions of the food secure households that scored a low LSM (17%). Almost a third (32%) of the households interviewed in Tembisa had an LSM below the average measure (Figure 21).

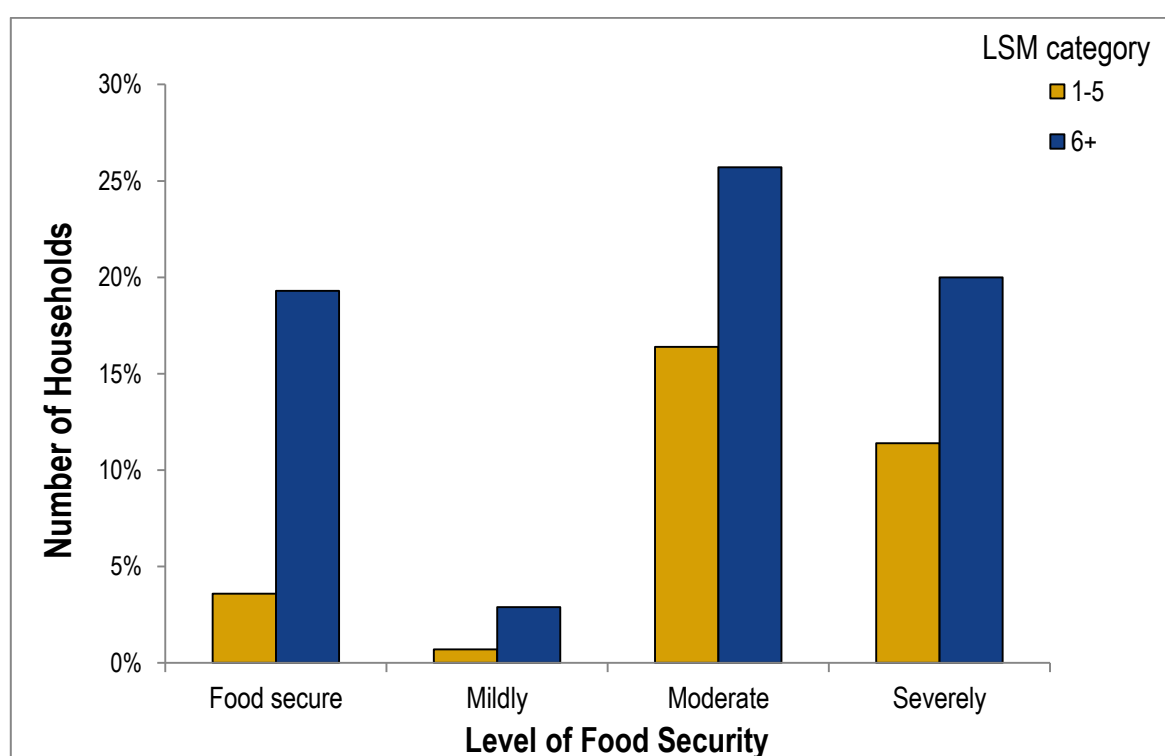


Figure 21. Proportions of households in comparison to the Living Standard Measure (LSM) score, where a score ranging from 1-5 was considered to be a low LSM and a score above 5 was considered to be a high LSM score.

Although some households had possessions that were in a good state (in working condition), in some cases they were unable to use them. In one instance during interviews we came across a family with a vehicle which seemed as though it was intact, however, it had gathered large amounts of dust. When asked about the car the participants mentioned that though the car worked, they had come upon hard times and could no longer afford to use the car because they did not have money to buy fuel.

4.6 Food access over time

Households were requested to rate their access to food and how it has changed in the past 4 years including the present year (2016). The four year history was selected because going beyond four years may lead to a less vivid recollection food access. The difference between the four years was most visible in those experiencing adequate and inadequate levels of food access (Figure 22). There were higher proportions of households with adequate access to food and lower proportions of households experiencing inadequate food access in the first year (2013). However, as the years progressed there was a visible change in those proportions (Figure 22).

The difference in the proportions was most visible in the last year (2016), where there were more households experiencing severely inadequate food access (one-sample $t(3) = 4.142$, $p=0.0247$), than those experiencing adequate food access (one-sample $t(3) = 5.760$, $p=0.0106$) (Figure 22). We also noted that the change in the number of households stating they had 'mildly adequate' food access remained relatively stable throughout the four years, when compared to the other states of food access (Figure 22).

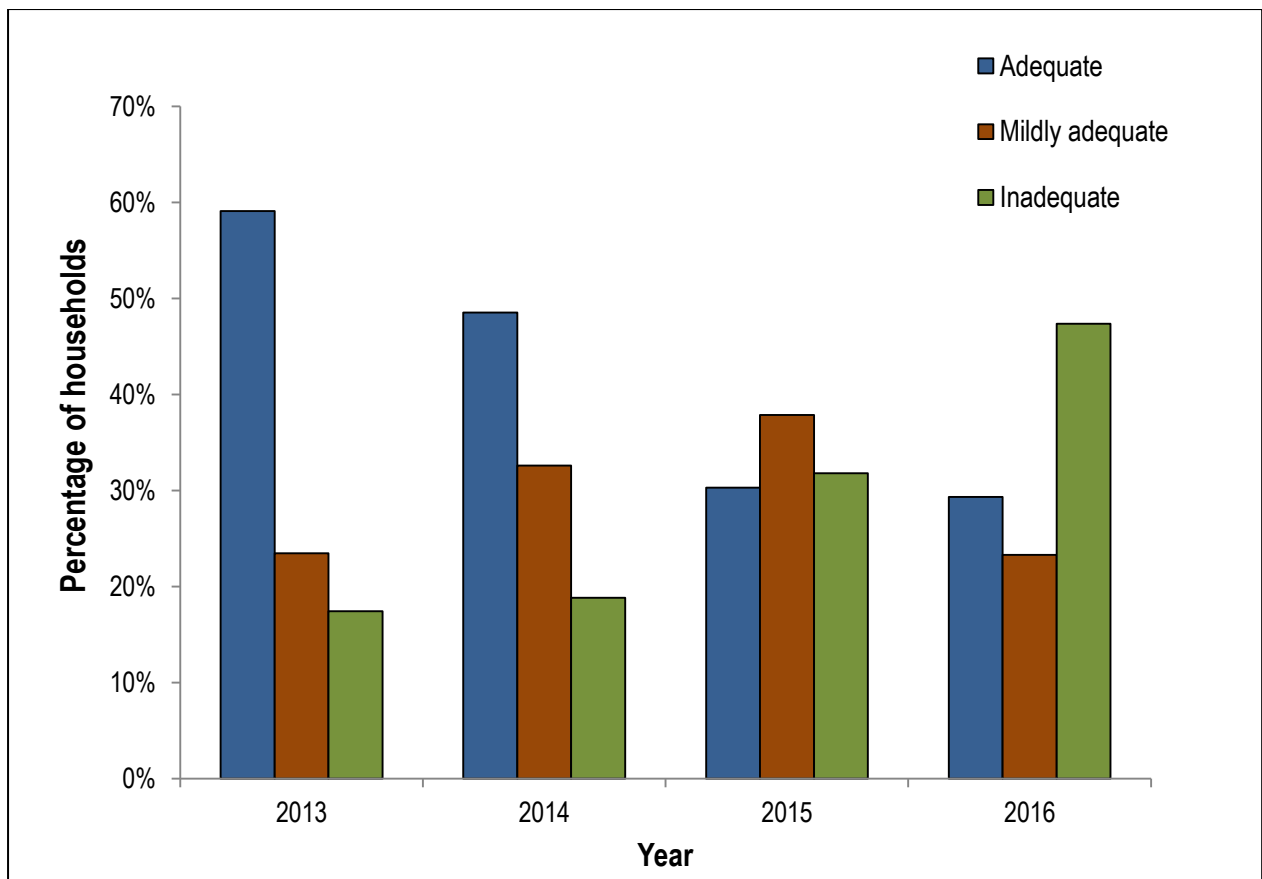


Figure 22. The perceived state of household food access in respondent household, from 2013 to 2016.

A number of respondents noted that the change from ‘adequate’ to ‘inadequate’ food access had to do with their current state of employment, where a breadwinner may have lost a job resulting in lack of capital to spend on food. Residents also mentioned how the rise in food prices had limited their food access due to lack of funds to buy food at the increased prices. Many of these households income could not compete with the inflated food prices and this was more evident in 2015 and 2016. During this time, South Africa was experiencing a drought that was characterised as one of the worst droughts to hit the country in 30 years (BBC, 2015). The drought was accompanied by lapses in maize production in addition to other crop failures, which in turn lead to inflated food prices.

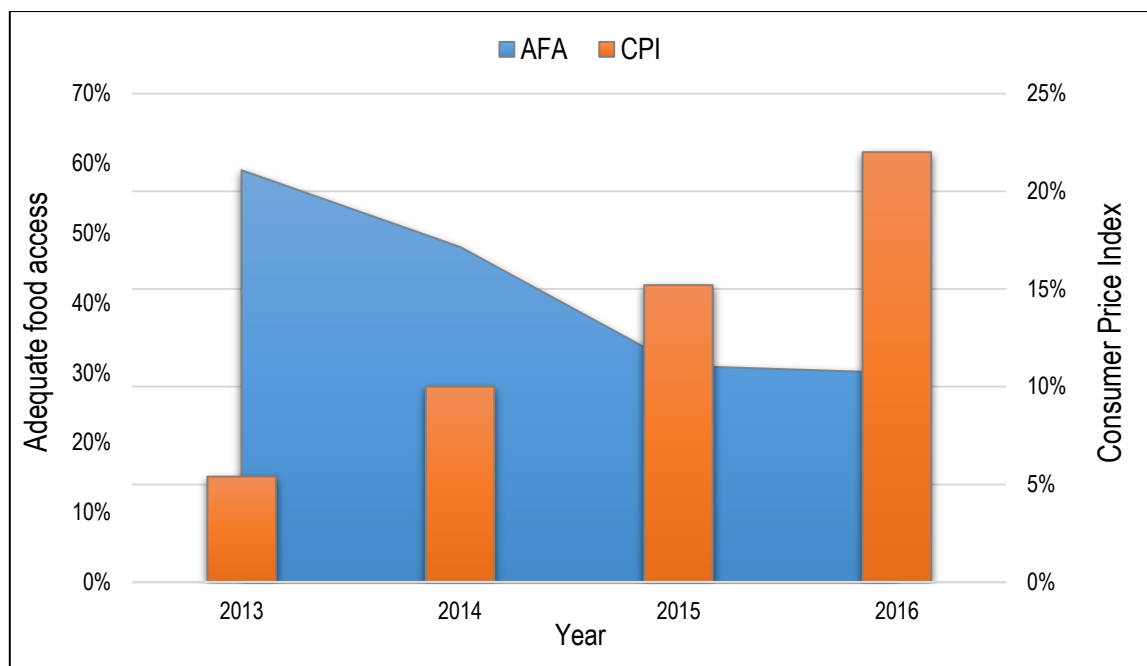


Figure 23. The relationship between household reporting adequate food access (AFA) and the Consumer Price Index (CPI), FROM 2013 TO 2016 (CPI data retrieved from Stats SA database).

Adequate access to food and South Africa's Consumer Price Index (CPI) showed a negative relationship for the past four years (2013-2016). The CPI increased constantly over the years and as the CPI increased the number of households with adequate access to food had declined (Figure 23).

4.7 Coping strategies

Various coping strategies were taken note of and summarised into 10 key strategies. Borrowing money from friends, neighbours and colleagues was the most common strategy used by Tembisa residents. Almost half (42%) of the residents made use of this strategy often coupling it with other strategies, such as getting money from *mashonisa* (Loan shark) or 'Other' unidentified methods (Figure 24). Micro money-lenders (*mashonisa*) in Tembisa, charge a 50% interest on whatever money they loan the residents, usually on a sort term basis. A respondent did however mention that when the *mashonisa* was your friend you could borrow money at a lower (30%) interest rate.

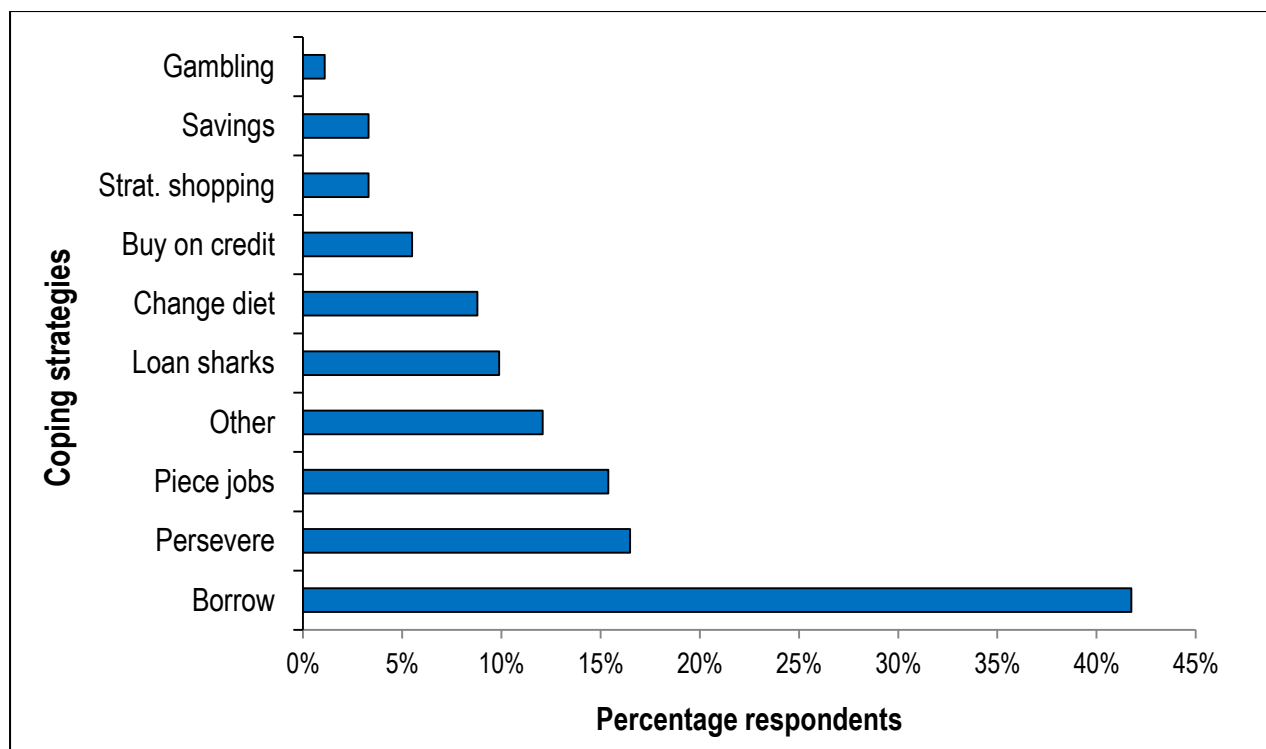


Figure 24. Mechanisms used by food insecure households in Tembisa to cope with or combat food insecurity. 'Strat. Shopping', represents the culture of bargain shopping and 'borrow' strategy represents households which borrowed from neighbours, colleagues and friends.

Even though the benefits of buying food on credit outweighed borrowing money from *mashonisa*, there were still higher numbers of people who borrowed money from *mashonisa*, than those buying food on credit from the local *spaza* shop. The second most common coping strategy was to 'persevere'; in this case households would do nothing about the situation but "just accept it", in the words of respondent TEA 8: "When something is not there, it is not there, you need to accept the situation for what it is". Perseverance also meant households would either have to skip meals or reduce the quality and quantity of their diets. Another common means of coping involved taking up 'piece jobs', these types of jobs would range from cleaning the neighbour's house to a painting job (Figure 24). Although these jobs were low paying temporary jobs, they secured a meal for the affected households. Gambling and taking out from savings were the least used coping mechanisms in the community (Figure 24).

On all occasions it was the female participants who would sacrifice the amount of food and the number of meals they ate in a day to prevent a family member from starving. This

was not done only by mothers, but by grandmothers, aunts and even daughters. On one occasion a female scholar stated that she would rather reduce her own food than give her father less food to eat.

4.8 The urban economy: Market access

The key places where interviewed households bought their food from were Cambridge, Pick n Pay, Shoprite, and the local *spaza* shops (informal convenience shops usually run in one's home). Cambridge was the furthest shop from the study areas. Whereas all the *spaza* shops were situated within 100m to each household interviewed (Table 3). The majority of the *spaza* shop managers/owners were of South Asian and East African origin, whilst those selling in the vegetable markets were a mixture of individuals from the SADC region, mostly Mozambicans. There was some reluctance to answer questions pertaining to food prices from *spaza* shop owners and street vendors, but this was only observed amongst non-South African nationals and may be as a result of fear in light of the xenophobic attacks which recently happened in South Africa.

Table 3. A comparison of food price volatility between formal and informal shops, with average distance of the shops from each study area.

Shop	Distance from area (km)			Domestic food price volatility index
	Temong	Teanong	Ethafeni	
Cambridge Food	6.1	5.3	5.4	0.743
Shoprite	3.7	3.2	1.9	0.807
Spaza TEA	n/a	> 0.1	n/a	0.276
Spaza TEM	> 0.1	n/a	n/a	0.151
Spaza ETH	n/a	> 0.1	> 0.1	0.159

From the shops monitored over the period of 6 months, prices at the retail outlets (Shoprite and Cambridge foods) were the most volatile, with the highest volatility observed at Shoprite (Table 3). On the other hand, prices at the *spaza* shops were the least volatile, with Ethafeni *spaza* shops experiencing the least food price volatility (Table 3).

Finding a trend in the changes of food prices in major retail outlets was difficult. There was no clear trends noted in the six months of the study. Prices in retail outlets would rise and fall randomly with no indication of why this may be. A manager of a retail outlet which will

remain unnamed, mentioned how new prices for different food items were sent into the stores daily from higher management; this may explain the lack of consistency in food price changes at retail outlets.

In contrast, food prices in the *spaza* shops were mostly constant for a relatively long period of time before rising (Figure 26-32). However, because of the volatile nature of retail food pricing it was difficult to tell whether prices were truly decreasing or whether it was just another case of lower prices in one month which would be accompanied by higher prices in the following month.

Table 4. A comparison of vegetable prices (per unit) between surveyed retail outlets, *spazas* and vegetable markets.

<u>Veg type</u>	Price in Rand (** Not available)			
	<u>Pick n Pay</u>	<u>Shoprite</u>	<u>Veg market</u>	<u>Spaza</u>
Spinach	8.49	**	10	**
Carrots	0.7	**	0.83	**
Green pepper	3.88	**	2.25	**
Potatoes	1.48	1.8	1.02	1.25
Cabbage	17.99	**	23.33	**
Onion	1.78	1.8	1.16	1.76
Tomatoes	2.45	2	1.43	1.45
Beetroot	0.75	**	1	**

Onions, potatoes and tomatoes were the vegetables that were obtainable in each market place where interviews took place, most probably related to how frequently these are utilized in households (Table 4). The most affordable places for households to purchase these vegetables in particular were *spaza* shops and vegetable markets (Table 4). Other vegetables like spinach, cabbage, carrots and beetroots were most affordable at Pick ‘n Pay (Table 4). Shoprite was the least affordable place for households to buy the most frequently used vegetables (Table 4).

Over the first three months of the food price monitoring, the prices in the *spaza* shops were constant with minimal fluctuation (Figure 25). During March, these prices rose significantly at *spaza* shops in all three study areas (Figure 25). Ethafeni had the highest

average food prices throughout the 6 months monitoring, however the increase in food prices in March was not as high as it was in the Teanong and Temong.

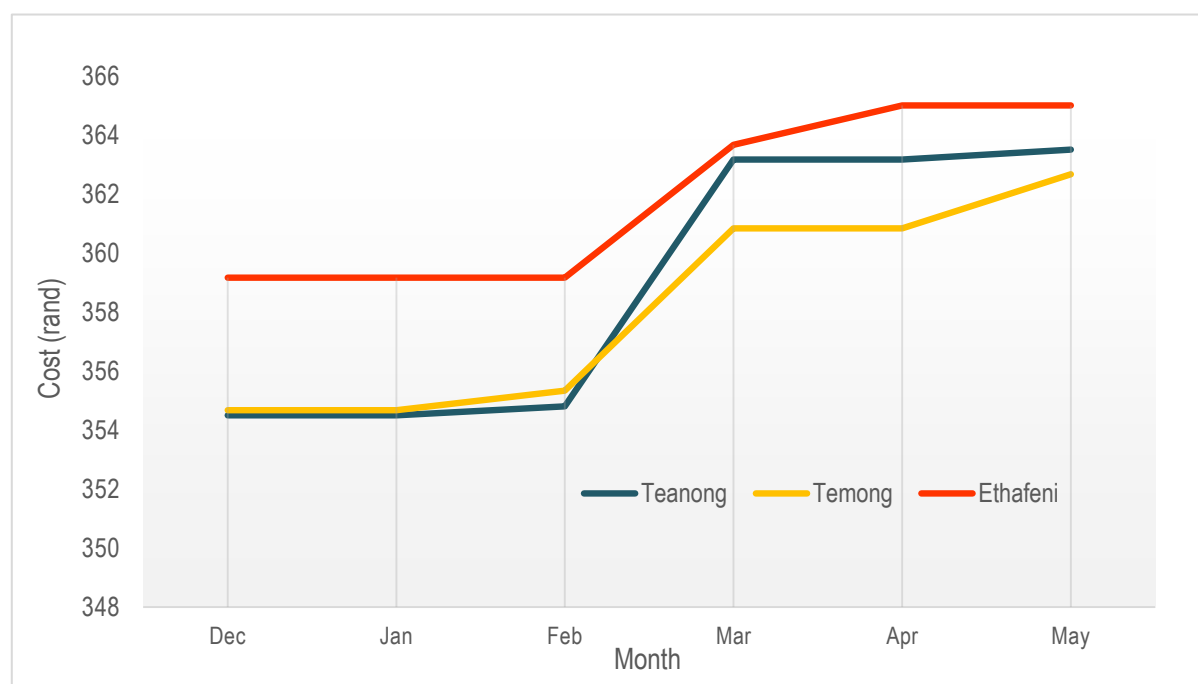


Figure 25. Food price monitoring assessing the cost of at spaza shops within each study area over a period of months (December 2016 to May 2017).

It was evident that the majority of the participants (94%) interviewed were aware of the recent food price increases in the past year. Food was said to be too expensive at *spaza* shops, which is evident in the finding of this study (Figure 26-32). However, household members continued buying at *spaza* shops. In all instances except one, *spaza* shop prices were visibly higher than those of the retail outlets used by local residence (Figure 26-32). Bread, flour and rice appear to be the most volatile prices in retail outlets, with fluctuations in the price of bread in one retail outlet exceeding the price in the *spaza* shop during December 2016 (Figure 26-32). When observed closely it was clear that the changing bread price was closely linked to the change in the cost of flour (Figure 27-28).

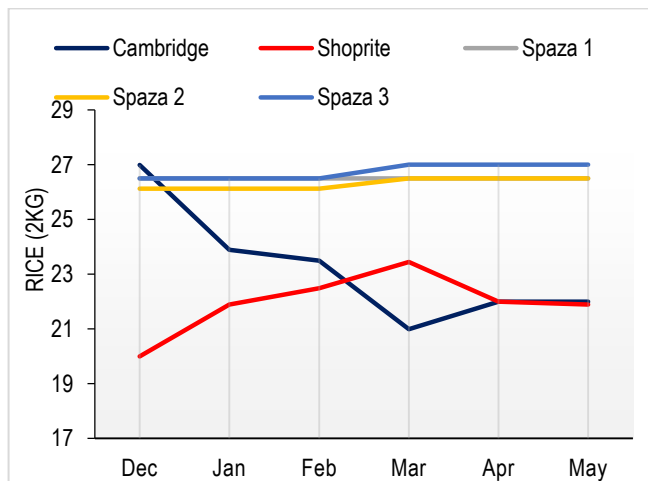


Figure 26. Price changes for rice (2kg) in stores used by Tembisa residence over a period of 6 months (months represented on the x-axis), where the y-axis represents the price of the specified food in the South African Rand, spaza 1= Teanong, spaza 2 = Temong and spaza 3 = Ethafeni.

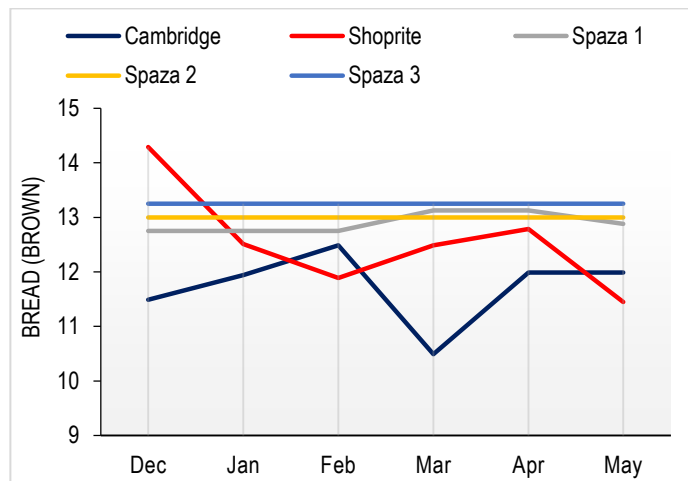


Figure 28. Price changes for brown bread in stores used by Tembisa residence over a period of 6 months (months represented on the x-axis), where the y-axis represents the price of the specified food in the South African Rand, spaza 1= Teanong, spaza 2 = Temong spaza 3 = Ethafeni.

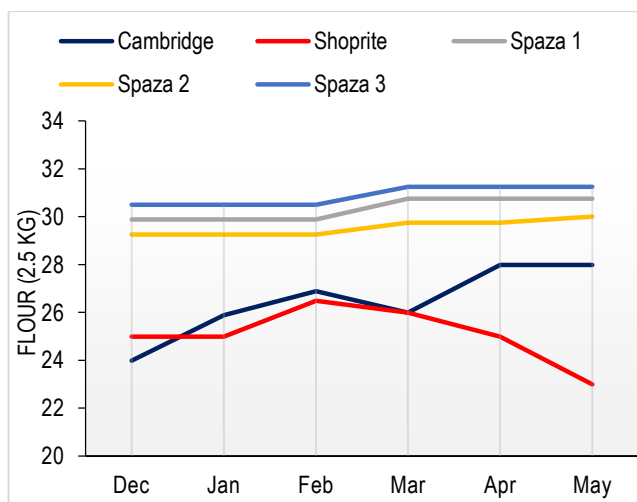


Figure 27. Price changes for flour (2.5 kg) in stores used by Tembisa residence over a period of 6 months (months represented on the x-axis), where the y-axis represents the price of the specified food in the South African Rand, spaza 1= Teanong, spaza 2 = Temong spaza 3 = Ethafeni.

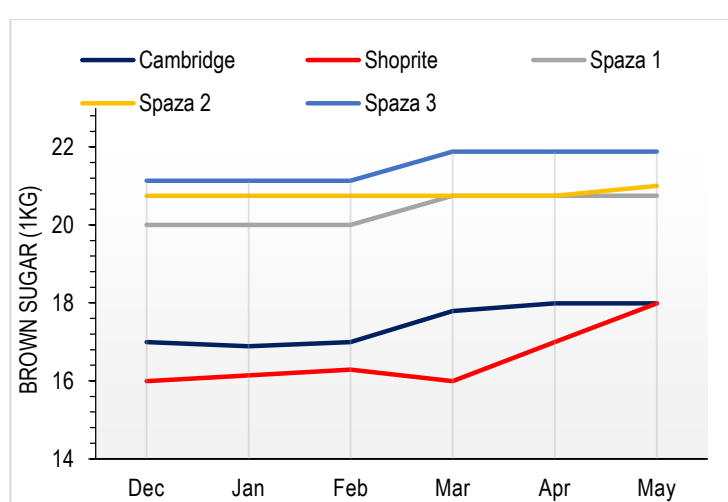


Figure 29. Price changes for brown sugar in stores used by Tembisa residence over a period of 6 months (months represented on the x-axis), where the y-axis represents the price of the specified food in the South African Rand, spaza 1= Teanong, spaza 2 = Temong, spaza 3 = Ethafeni.

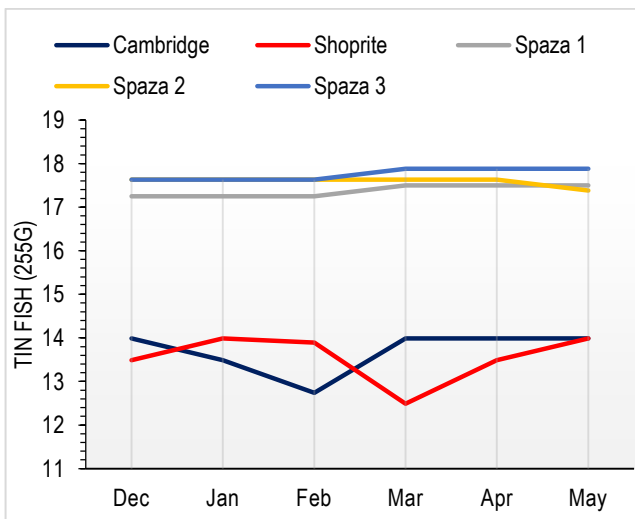


Figure 30. Price changes for tin fish in stores used by Tembisa residence over a period of 6 months (months represented on the x-axis), where the y-axis represents the price of the specified food in the South African Rand, spaza 1= Teanong, spaza 2 = Temong and spaza 3 = Ethafeni.

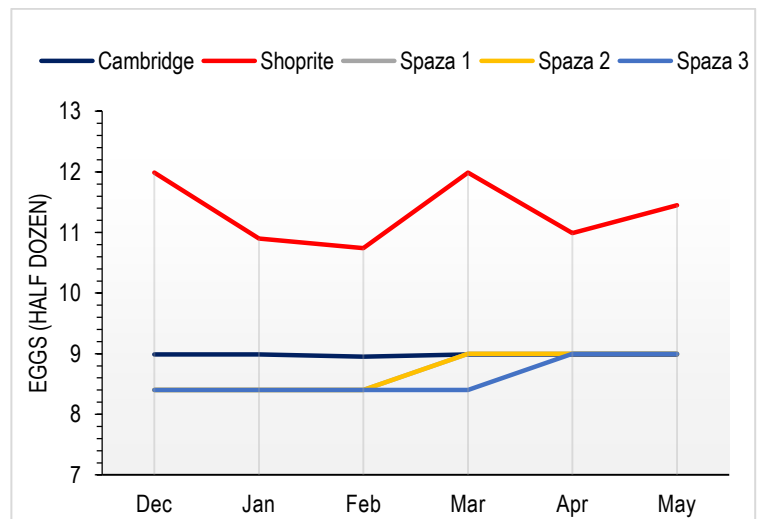


Figure 31. Price changes for eggs (half a dozen) in stores used by Tembisa residence over a period of 6 months (months represented on the x-axis), where the y-axis represents the price of the specified food in the South African Rand, spaza 1= Teanong, spaza 2 = Temong and spaza 3 = Ethafeni.

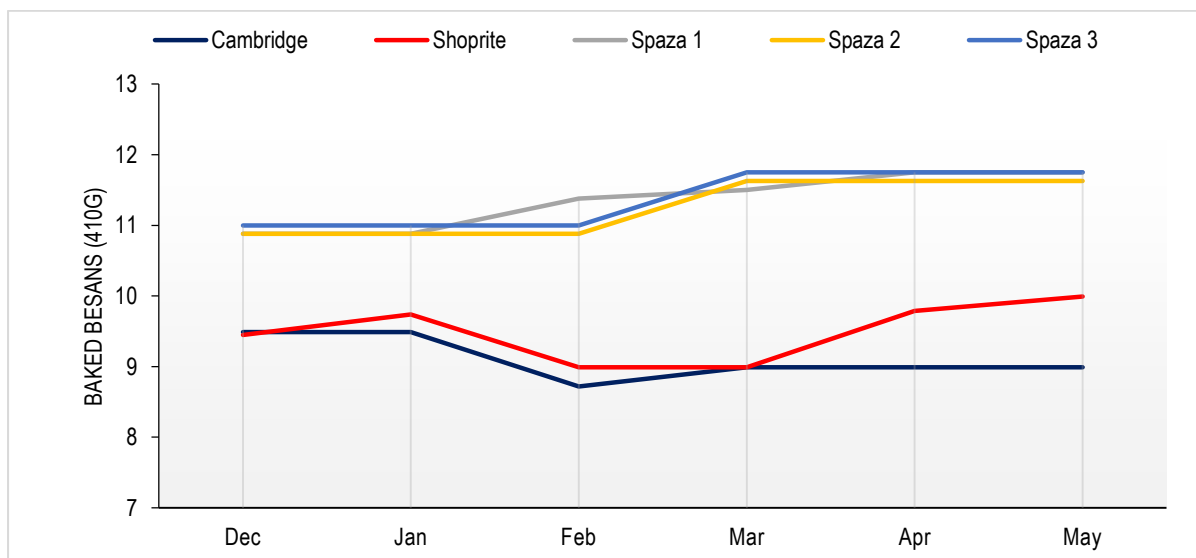


Figure 32. Price changes for baked beans in stores used by Tembisa residence over a period of 6 months (months represented on the x-axis), where the y-axis represents the price of the specified food in the South African Rand, spaza 1= Teanong, spaza 2 = Temong and spaza 3 = Ethafeni.

4.9 Perceived drivers of food price increases.

A total of 20 shop owners and informal traders were asked to state the main cause of their food price changes in the past year. A large proportion of shop owners/managers attributed the recent food price changes in their store to administered price increases (Figure 37). This was mostly observed by the *spaza* shop owners, because they purchased their stock from wholesalers, and had no control over the prices they were charged. However, a couple who owned a *spaza* shop that was about to close stated that although most of the *spaza* shops bought their stock from the same wholesaler, some *spaza* shop owners were charged less than others for the same products.

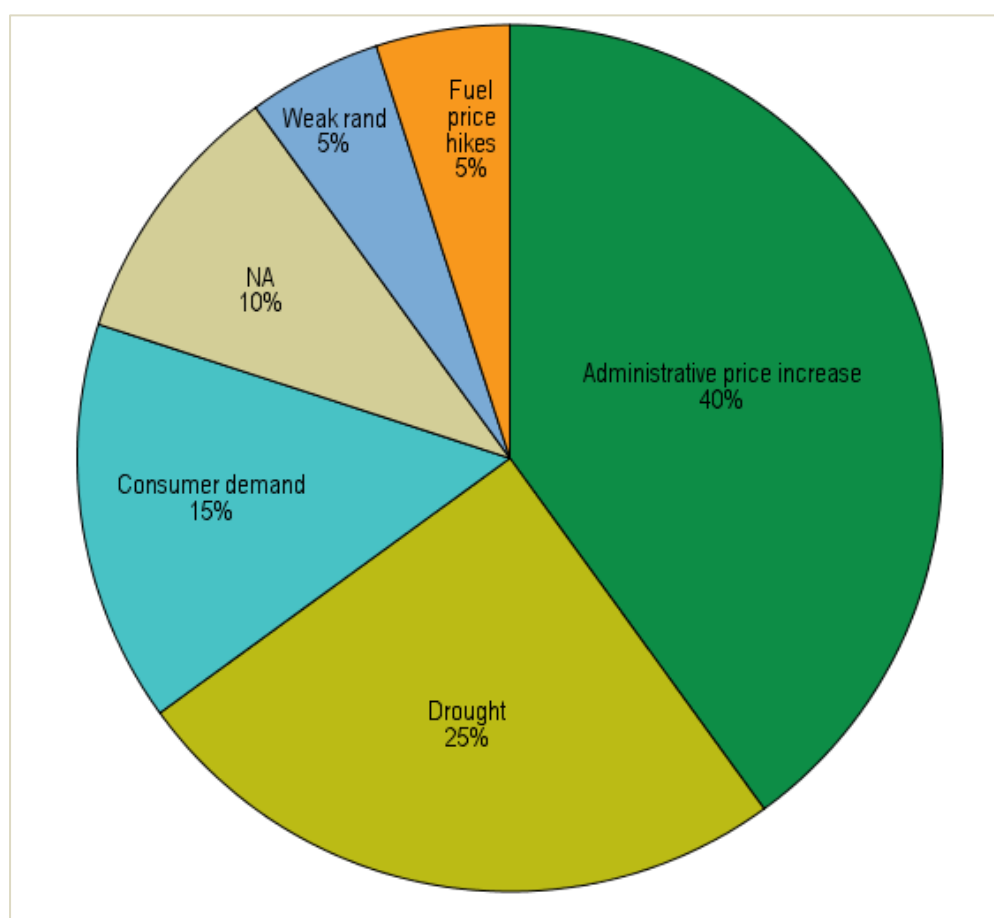


Figure 33. The main perceived causes of food price hikes in the past year (October 2015 – October 2016).

The lack of rain -as a result of the drought during the 2015/2016 period- was a key concern for those who worked in the vegetable market, stating that with rain the price of vegetables could drop by almost 50%. Those selling in vegetable markets procured their

goods from farmers, so although their prices were often affected by rain, the pricing was in the hands of the farmers they procured their goods from. Recent fuel price hikes, and the weak rand were mentioned on very few occasions (Figure 33).

4.10 Additional observations

4.10.1 The cost of electricity

A key concern for the local community was the cost of electricity, which often took a large percentage of their total income, leading to limited money to procure food. Tembisa residents receive a R200 free electricity voucher every month, when that electricity is used-up, they need to top it up using their own funds. In spite of this initiative, residents complained about the high electricity tariffs, which left them still having to spend what they viewed as a large proportion of their income on electricity.

4.10.2 Livelihood strategies

It was interesting to find that the use of the different capitals amongst households was minimal. Instead, households opted to diversify their financial capital, through different sources of income such as social grants, informal/ formal work and even through informal credit. Although there were social networks in the neighbourhood, the act of asking a neighbour for money or food was frowned upon, because of embarrassment one felt, and the assumption that the neighbour was either far worse off or in the same boat as them.

4.10.3 Urban agriculture participation in Tembisa

The role of various agricultural programmes also play role in food insecurity in township areas. In the case of this research, there was one instance where a mother noted that she participates in an agricultural programme at a local schools' food garden. She noted that when participating in the agricultural programme it meant her family did not go hungry or have to worry about food prices going up. However, the lack of land to participate in urban agriculture is a key concern in the community. An additional concern was the reluctance of the youth to participate in urban agriculture. In some instances urban agriculture was undermined and viewed as a rural activity being conducted in an urban space. It was noted that most of the households did not participate in formal grocery shopping, where bulk shopping would be done on a prescribed date in the month. Shopping was mainly based on

need and on where there was a sale occurring. Some families would not purchase certain 'big foods' unless there was a sale.

4.11 Local interventions

The key intervention that was repeatedly mentioned by households was the South Africa's National School Nutrition Programme offered by the Department of Basic Education to poor South African primary and secondary schools. The programme provided between one to two balanced meals per day, namely breakfast and lunch which consisted of a starch, two types of vegetables and some protein. Often parents referred to how they would skip and reduce their meals for the sake of insuring that their kids have food when they get home from school. However, because of the Feeding Scheme, their kids never had to skip meals; the only concern was holiday time when there was no feeding scheme. One parent mentioned how the child would at times bring left-over food home, from the lunch they had received at school during the day.

5. Chapter five: Discussion

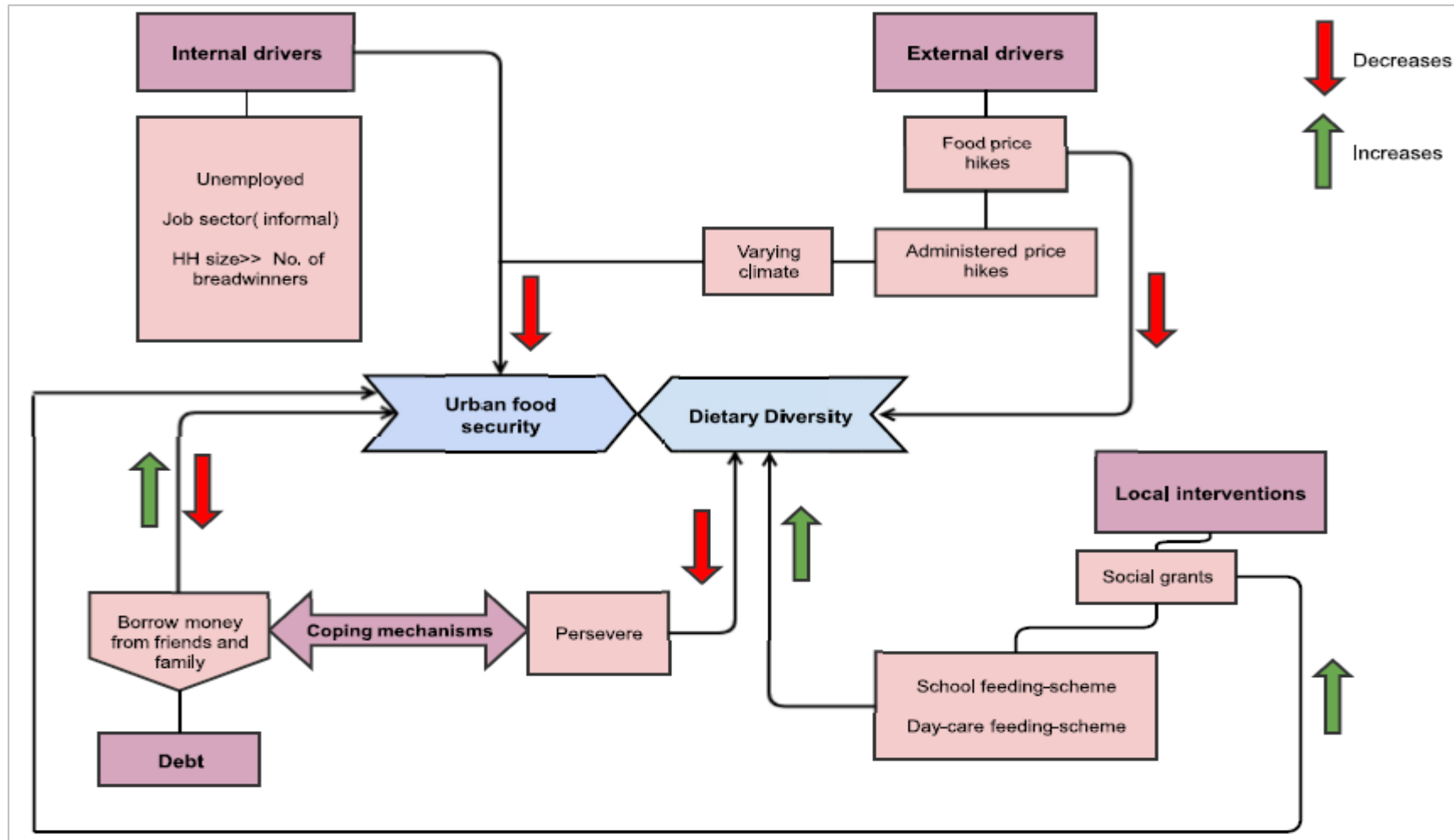


Figure 34. This conceptual diagram illustrates the linkages between the drivers of food security and how they interact with each other in Tembisa.

In order to bring together the three components assessed in this study the varying underlying implications of the results for urban food security are discussed. The elements of this discussion form part of a complex system, therefore it is important to understand them as factors that are not mutually exclusive. Driving forces behind food security are all interconnected, as observed in the conceptual framework above (Figure 34). Overarching drivers of food insecurity have been identified and recognised as integral role-players in the pathway towards food secure households (Figure 34). In this section the underlying factors and trends observed in the study are discussed in depth.

5.1 The status of food security in urban households

Despite the reported decreased prevalence of food insecurity amongst the South African community between 1999 and 2016, the results in this study point to an increase in the prevalence of food insecurity over the previous four years amongst Tembisa households (Alteman *et al.*, 2009; Labadarios *et al.*, 2011; Statistics SA, 2017). Such findings are not unique to the current study as this has been observed in several sub-national studies also conducted in South Africa (Van der berg, 2006; Alteman *et al.*, 2009; Labadarios *et al.*, 2011; Teka *et al.*, 2014; Mkhwanani *et al.*, 2016; Statistics SA, 2017). The state and severity of food insecurity in the participant households is, however, alarming, where more than a third of the households interviewed (76%) reported some level of food insecurity, even surpassing the South African estimates of food insecure households (22.3 %) in 2016.

The low numbers of food secure households are well reflected in the dietary diversity score, which is reasonably low, compared to other studies (Battersby, 2012). Diets were mostly made up of vegetables, a high intake of meat protein, and staples such as maize, which are nutritive food sources when compared to the fats and oils which would otherwise be consumed. Battersby's (2012), study conducted in Cape Town differed from the results in the current study in that a relatively high average Household Dietary Diversity Scale (HDDS) was observed by Battersby, however, these diets were mostly made up of non-nutritive food-stuffs. This however does not take away from a third of the respondents who scored an HDDS below 4 which is viewed as inadequate to a household in good health (Rudolph *et al.*, 2012; Faber *et al.*, 2017).

Similar to Faber *et al.* (2017), food secure households in this study had a higher dietary diversity and appeared to be the group that was most likely to have a varied diet when compared

to moderately and severely food insecure households. Food secure households also tended to fall under the higher living standard measure (LSM) category, further illustrating that wealthier households in the same community had a higher likelihood of consuming a diet with a high variety, as compared to their lower-income counterparts. Such results illustrate the importance of wealth and income in combating hunger and malnutrition, which are mostly limited by financial constraints in urban communities and may be the reason why nutrient-rich foods, such as fruit and vegetables, are not consumed in larger amounts.

5.2 Balanced diet from an imbalanced income

The recommended fruit and vegetable intake in South Africa is 5 fruit and vegetables per day, however, the households meeting that requirement seem to be few. (Department of Health 2016). The affordability of these food groups continues to act as a limitation to the nutritive food intake of low-income urban households from informal employment, especially where large proportion of the gross household income is already spent on food. The attitudes towards the buying of fruit amongst respondents in the current study was similar to observations made by Faber *et al.* (2017), where both food secure and food insecure households attributed their major limitation of fruit consumption to cost. In addition, Kroll (2016) found that casual/informal employment was seen as the most significant role-player in the low dietary diversity of households. Many of the households interviewed mentioned how the recent food price increases had resulted in them being unable to afford the foods that they were accustomed to buying. Faber and Drimie (2016), argue that the rise in food prices is often associated by a decrease in the quality of a household's diet.

In light of the above, the nutrition of children is often left in the hands of school-feeding schemes, which sometimes offer the only nutritious meal that children will consume throughout the day. The role of school feeding schemes has proven to be important amongst low-income households through the increase of micro-nutrient intake. These micro-nutrient benefits of school-feeding have also been observed amongst young children in Zimbabwe, Namibia, Nigeria, Kenya and Ghana who are recipients of school feeding schemes in their respective countries (UNDP, 2016). In addition to the micro-nutrient benefits of the school-feeding schemes, more children were seen attending schools in regions where the school-feeding schemes were offered, which further reflect the importance of school feeding schemes in low-income urban poor

communities in combating lack of opportunities for optimal education amongst young Africans, which may in fact aid in breaking the cycle of poverty in the affected families.

Although street vendors do offer vegetables at more reasonable prices as compared to most shops, fruit and vegetable intake amongst urban households did not meet the WHO daily requirements. A reason for the lack of fruit and vegetable intake may be the placement of these stalls, close to the roadside and sometimes adjacent to waste products of the vendor's expired stock, or simply the fact that even though vegetables are more affordable from informal outlets when compared to formal retail outlet prices, households are still unable to afford fruit and vegetables at lower price and because of this, healthy foods are not seen as a necessity due to circumstances and not choice. Similarly, during the 2007-2008 recession food prices increased drastically, and the first food –type to be removed from diet from households were fruit and vegetables (FAO, 2012).

Despite the lack of fruit/vegetable intake, the consumption of meat protein appeared to be relatively high. Higher consumption of meat as compared to other food stuffs i.e. legumes came as a surprise given that legumes are generally more affordable than meat. When trying to understand why, it was realised that, although meat is costly, the cost all depends on the type of meat and the body part of the animal that one chooses to consume. For instance, chicken feet, chicken livers and giblets are significantly cheaper than other body parts, consequently, it may be that these households are choosing to consume these less expensive meat parts over the more costly parts as a coping mechanism. This was similar to findings from a study conducted by Kruger *et al.*, (2008), where cheaper alternatives such as chicken feet, were often used as a supplement for protein.

Darmon and Drewnoski (2015) also mention how some low-income households settle for fattier cheaper cuts of meat as a means of maintaining meat consumption, at a minimal cost to the household. According to Kruger *et al.*, (2008), this was often used by South African farm workers as a coping strategy. Switching to cheaper alternatives allowed for some protein intake in the affected households. These however, were households from rural areas, which does not mean the theory should be overlooked, but that this may be a reflection of how some, if not most township households are made up of individuals or groups that have migrated from rural to urban spaces. Another study also showed that low-income households tend to spend less than half of what wealthier households spend on meat, however the consumption of meat of the urban poor was still considerably high (Kroll, 2016). Another reason for high consumption of meat could

simply be a result of preference. Kroll (2016) suggests that the importance of meat even amongst the poorest households remains high this may explain why meat is chosen over more affordable alternatives.

In addition to high consumption of meat, high levels of maize meal were consumed in Tembisa, similar to Mendenhalls' (2014) findings. Several other studies further illustrated that the gravitation towards this starch is linked to its affordability and filling quality (Battersby and Crush, 2014; Kroll, 2016; Drimie *et al.*, 2013). Foods made from cereals, such as maize, are often cheaper and more filling than other food types, (Kesa and Oldewage-Theron, 2005). Therefore more families opt to consistently have maize in their diets over other healthier alternatives which are viewed as less filling, have a shorter shelf life and often do not accommodate an entire household. The high consumption of maize and low nutrient intake of the South African community drove the South African government to the introduction of maize fortification initiatives where Vitamin A, B₁, B₂, B₆, Niacin, Folic Acid, Iron and Zinc were added to all maize products with the purpose of averting the current nutrient intake or lack thereof.

5.3 Characteristics of food insecure households

What is clear is that the inflation of food prices coupled with the low-income status of households plays a significant role in the current high instances of food insecure households. Those who experienced high levels of food insecurity were often unemployed or derived their income from informal employment and social grants. Similarly, Misselhorn and Hendriks (2017) found that in a review of 169 studies on food security, 51% attributed their food insecurity to the lack of income. Many of these had large numbers of household members when compared to the number of breadwinners. Although Frayne *et al.*, (2010) suggests that household size may be an inadequate measure of the determinants of food insecurity, in the current study it appears that household size when related to the number of breadwinners per household may be a good measure of the determinants of household food security.

In addition, non-renting households and those living in RDPs and shacks appeared to be more at risk of experiencing food insecurity than those renting and living in back-rooms. In order for a household to qualify for an RDP, the household should not earn a combined monthly income that is above R3500. The majority of the households living in RDPs had a minimum of 4 household members. In as much as the housing is free, assuming that the household truly does

rely on a combined income of less than R 3500.00, there are still food, transport, clothing and electricity costs which leave households with minimal or no disposable income. Thus, the likelihood of households living in an RDP being threatened by food insecurity increases.

The higher instances of food insecurity amongst home-owners compared to those renting is likely to be linked with the responsibilities/commitments of the home-owner versus those of the households which are renting. Apart from the mortgage payment cost which often surpasses that of the household renting a back-room, those living in their own homes tended to have more household members than those living in back rooms therefore more people to feed. Furthermore, those who were renting out back rooms were mostly the youth and very young couples, often with fewer responsibilities and financial commitments.

5.4 Coping behaviours

Due to the extremes of food insecurity in the current area various strategies are adopted by the households as a means of coping. Borrowing money from friends, neighbours and colleagues, suffering in silence and the acquiring of piece jobs are the most frequently mentioned principal coping mechanisms, often in partnership with one to two more other coping mechanisms. Despite income raised by social grants such as the Grants for Older Persons and Child Support Grants, households benefitting from the grants continue to have difficulty providing adequate and nutrient efficient food for their households and thus experience higher levels of food insecurity. Faber *et al.* reports similar findings where households receiving social grants were less likely to be food secure and had a low living standard.

The continued inability to make ends meet despite grant input is often met with risky coping behaviour consequently bearing negative implications for the safety and health of the household as a whole. Often households find themselves living from hand to mouth through the additional money acquired through borrowing from friends and family or simply through a change to lower quality diets and decreased meal quantities. Hence formal grocery shopping is seen as a luxury and people only buy the necessary food through bargain shopping and when they have the means to do so.

Households usually have no access to formal credit as a result of the informal nature of the work that many households live off, and may at times have to resort to informal credit at the risk of harassment and unreasonable interest rates. When shopping does happen, it happens in a

variety of places, like the larger and small retail outlets, *spaza* shops and vegetable markets. The majority of the households acquire their food through both formal and informal markets, with minimal use of urban agriculture as a means of raising finances or even increasing the diversity of food in the household.

Considering that social grants income is small and the use of social grants is not limited to purchasing food, but also contribute to other necessities such as paying for electricity, buying of clothing and paying for transportation, especially when it has to be spread across more than one individual, the money is often already gone by the time it arrives. Frayne *et al.* (2010) also argue that households receiving grants are often already poor to begin with and the presence of the grant does not signify higher levels of food security. The importance of social capital becomes crucial in the urban context, since being able to obtain money or food from a neighbour or a friend is less risky than doing business with a *mashonisa*. Unfortunately, being unable to provide for one's own family is often an uncomfortable reality for some households and so to avoid embarrassment, many families prefer suffering in silence over placing themselves in a position where their acceptance or how they are viewed in the community may change. A similar observation was made in Khayelitsha where residents preferred not to ask neighbours out of fear of eroding social capital (Battersby *et al.*, 2015b).

Furthermore, in such settings it is often understood that the financial state of neighbouring households and of close family are similar, thus the idea of asking a neighbour or friend for help is uncalled-for. In addition, the increased reliance on micro-lenders compared to the buying of food on credit as a means of coping, may be a reflection of the severed social ties between *spaza* shop owners -who are often migrants from neighbouring African countries-and the local community.

5.5 Market influence on food access

The formal retail outlets displayed unpredictable changes in prices through time, where changes in prices appear to be sporadic. Reasons behind changes in food prices were often associated with prices declared by mother branches of the stores. In contrast, prices at the *spaza* shops are stable and unchanging for months before they are increased. However, the sudden increase in prices of all the *spaza* shops from the three sites during the month of March was noted. Migrant entrepreneurs come together to engage in bulk shopping for their stock. This

enables them to get their stock at more affordable prices and sell their goods at more affordable prices. Unfortunately, this method of coming together to share the load of buying stock was observed on fewer instances amongst shop owners from the SADC region (Peberdy, 2016).

This method of sharing the load is indicative of the social networks which exist amongst migrant *spaza* shop owners. The strong social cohesion may also allow the *spaza* shop owners to discuss their prices in order to ensure that each owner has a fair chance of getting customers. This may explain the synchronised change in prices for *spaza* shops during March 2017. In addition to this, the selection of the month of March as the month for price changes may have been aligned to the budget speech which takes place in March every year. It may be that *spaza* shops base their price changes on the outcome of the budget speech, however this theory may need to be probed further.

Many households made use of both informal and formal markets to purchase food. Shopping at *spaza* shops had its limitation because there were certain foods they did not stock. This meant that households had to make use of a variety of sources in order to fulfil their food needs. Contrary to findings of several other studies conducted on informal market pricing, in the current study it was found that food prices in retail outlets were cheaper than those in *spaza* shops but the cost of the most consumed vegetables was mostly more affordable in vegetable markets and *spaza* shops. However, these lower prices in retail outlets were for foods sold in larger quantities that most low-income urban residents relying on an unstable income would not be able to afford. This is where *spaza* shops thrive, as they were often found to cater for their communities through the provision of foods at more affordable lower quantities (De Haan *et al.*, 2000; Peyton *et al.*, 2015). Although this buying pattern costs more in the long-run, households living from hand-to-mouth are often unable to cater for long-term needs and thus rely on informal markets which allow them to purchase food at smaller quantities. In addition to foods provided at lower quantities, *spaza* shops offer long-term reliability in terms of food prices and temporal access. Often breadwinners work far away and for long hours relying on public transport as a mode of travelling to and from work, the fact that *spaza* shops remain open hours after formal retail outlets have closed aid in increasing food access within these communities. Although formal markets are viewed as more affordable options, they do not cater to the community's immediate needs.

5.6 The valley of debt

Purchasing food is the most central method of attaining food for Tembisa households as compared to growing their own, and it is central to the determinants of food security in urban households. The unfortunate part is that inflation does not happen at the same rate as wage increases, more especially in households made up of breadwinners who rely on informal income, which is often intermittent and not subject to the benefits of wage increases that are guaranteed to breadwinners who work in the formal sector. The results suggest that *spaza* shops and vegetable markets may be central to providing households with healthy and nutritious food. Limitations to them selling certain vegetables may be lack of infrastructure and equipment needed to keep certain vegetables from rotting.

Unfortunately, food credit seems to no longer be an option amongst these households. The change in access to food credit may have risen as a result of the past xenophobic attacks, which saw many shops being looted and several shop owners being severely assaulted. A recent study showed that 1 in 5 migrant shop owners had reported their business being negatively affected by South Africans simply based on their nationality, these were mostly Pakistani, Ethiopian, Somali, Bangladeshi and Malawian shop owners (Peberdy, 2017).

5.7 Geographical access to markets

In this case, geographical access to supermarkets appears to play a minimal role in the food security status of Tembisa households. Apart from the wholesalers, several other retail outlets were found within close proximity to households. *Spaza* shops were also no more than 100m away from each household therefore increasing geographical access to food outlets. This suggests that food insecurity in this instance stems from issues related to financial access, unlike in other studies where placement of retail outlets in the outskirts of neighbourhoods was the key driver of food insecurity. Several studies also suggest that geographical access may not necessarily be driving food insecurity in urban areas as many retail outlets have been observed organising themselves in and around South African townships (Battersby *et al.*, 2015a and Frayne *et al.*, 2010). Furthermore, Battersby and Crush (2014) found that when people participated in out-shopping, the money spent on transport did not increase because the retail outlets they purchased their groceries from were situated in close proximity to their workplace.

5.8 Thinking ahead (Current and future scenarios)

The South African constitution states that “everyone has the right to have access to sufficient food and water.” This is further supported by the second Sustainable Development Goal (SDG 2). Sadly, with regards to food security, the findings in this study are not encouraging.

Living in a country where the prevalence of HIV/AIDS in urban areas is still a matter of national concern, where every 1 in 5 people are living with HIV, it becomes important to ensure the adequate intake of healthy foods for South African households (NDH 2007). It takes the combination of a high quality diet and medicine intake to combat the death toll caused by the pandemic (Young *et al.*, 2014). The interaction between HIV and food insecurity has been referred to as a vicious cycle, stemming from the ability of each situations to aggravate the other. HIV can cause the loss of a household head leading to loss of income and food insecurity, whilst food insecurity can lead to malnutrition which in turn negatively impacts the health of an HIV affected individual through the increased rate of progression of the virus (Crush *et al.*, 2011).

Furthermore, adult nutrition also needs to become a central topic in the conversation on food security; current initiatives are focussed on the nutrition of the child under 18 years of age and breastfeeding mothers. Even with such initiatives, adults still need to sacrifice when it comes to the food that they eat for the sake of ensuring that children do not have to skip meals. The inclusion of adults in nutrition strategies allows for a holistic approach to combating household food security, because it comes as an advantage to the child in the long run.

Urban populations in the African continent are expected to increase rapidly, meanwhile in South Africa the number of people living in urban areas have already tipped the scale. However, many other African countries still have higher proportions of their population in rural areas. This however is changing and Africa is expected to reach 50% urbanisation by 2030. Studies like these can act as a baseline for planning mitigation strategies for countries that are soon to have higher urban communities. Especially since migration to urban settings entails an increased reliance on financial capital, therefore low income households may be affected by the financial constraint to food access in urban spaces, thus the affordability domain of sustainable food need not be ignored.

Low-income urban areas appear to thrive off an economy of their own, where formal credit is replaced by the *mashonisa*, retail outlets are replaced by shops mostly owned by individuals of

East Asian descent and formal employment by informal employment. The difference in these is that the formal markets, especially formal credit can at times be exclusionary of the low income urban community, hence leading to the desperation which is accompanied by unwarranted 50% interest rates. Furthermore, the cost of informal markets is usually higher than that of formal markets but when viewing these facts as a matter of access, the informal are more accessible to the urban 'poor', with benefits of quick access that would otherwise not be experienced from the formal market.

Currently there is no strategy that has been put in place to protect those falling under the informal labour market. However, it may be a good idea to take a page from the migrant shop-owners book and explore the possibility of shared bulk purchases between households who under normal circumstances do not have the individualized financial resources but when joining a larger group the financial limitations may become smaller.

Current initiatives aimed at reducing the number of food insecure households in urban areas, mostly point towards urban agriculture. Such solutions are met with many limitations, one simply being the unavailability of space to participate in urban agriculture. Urban townships are characterised by high populations and these areas tend to be densely populated. To add to this, most of these urban townships are structured in such a way where there a medium-sized yards with a main house appearing in the front part of the yard and back-rooms, ultimately leaving no space for home gardens. In Tembisa we find 38 862 households per km², this density surpasses that of Soweto, the largest township in South Africa (Statistics SA 2011).

There are several other hindrances to urban agriculture, in the urban township; one key concern is the lack of resources that are needed to practice urban agriculture. Several studies have been conducted to review the impact of urban agriculture on food security have shown that urban agriculture does not significantly assist in the alleviation of food insecurity amongst the urban poor; instead it benefited wealthier households more than the poor households (Frayne *et al.*, 2014; Haysom and Battersby 2016; Ruysenaar 2013). The plight of urban agriculture may be a case of applying solutions meant for rural food security in the urban context. Urban agriculture could work in urban areas which border rural areas, where communal land is available and access to this land is not a hindrance (Haysom and Battersby, 2016).

In addition, there has been an overall downward trend in the number of households taking part in agricultural activities in South Africa, which is contrary to what one would expect, especially in Gauteng where there has been a general push towards urban agriculture (Stats SA,

2016). The dynamics behind this trend should be investigated as a means of ensuring that any urban agriculture initiative applied in a community is sustainable.

Tembisa, is a heterogeneous landscape, made up of low, middle and high income households. What we observed in the Living Standard Measure (LSM) does not only suggest that more food insecure households tend to have a low LSM, but also that even households which were otherwise wealthier before may be losing their ability to keep up with food inflation. Therefore, the issue of food insecurity in urban South Africa may be transitioning from an 'urban-poor/ urban-informal' problem, to a middle-class challenge as well, with both groups ultimately spending greater proportions of their income on food.

South Africa has come far in its advances towards combating social insecurity as a whole, but there is a need to develop policy that advises urban household food security with a clear understanding of the underlying structural aspects behind it. More so since over two thirds of the South African population in particular is situated in urban spaces. The subject of urban household food security is one which currently affects and will soon affect many other developing countries, more especially in Africa, because more countries will find their populations moving towards more urban situated populations. In light of this, urban household food security will need to take precedence in order to ensure reliable mitigation strategies in the years to come. With the predicated decline in food production and inevitable increase and volatility as a result of rapid climate change, this development of mitigation strategies is a matter of urgency.

Sub-Saharan Africa (SSA) is recognised as the most food insecure region in the world, there is an estimated 220 million people who are undernourished, that is almost a quarter (22.9 %) of the entire (950 million) SSA population (FAO, 2015; OECD-FAO, 2016). The SSA population is expected to increase to almost 2.1 billion in 2050, causing additional pressure on the agricultural system through increased demand in agricultural production, and ultimately food insecurity (OECD-FAO, 2016). Within the upcoming years food prices are expected to rise. Although South Africa is highly developed as compared to the rest of the continent, high levels of household food insecurity exists in its urban areas. South Africa may therefore serve as a model for countries in the African continent, more especially to prevent unsuccessful implementation of food security strategies.

5.9 Implications for policy

Advances towards addressing urban food security remain biased towards the rural community in a country where poverty is mistaken to be a rural problem. The constant undermining of urban food security comes as a result of relying on proportion-based results which do not necessarily break down the numbers in a way where the extent to which the urban populations affected are understood contextually by policy makers, therefore policy may end up with misdirected efforts. There is a need for researchers to breakdown the data collected in a way that will allow policy makers to make well-informed and unbiased decisions. Current policies continue to undermine the vulnerability of both urban and peri-urban communities in light of food and nutrition security.

5.10 Conclusion

Based on the findings of this study it is clear that food insecurity at different intensities remains a key concern for these urban communities. It is also evident that many governmental benefits have become a cushioning factor for the most vulnerable households, where a large weight of the social security burden falls into the hands of the state due to its constitutional obligations. However, with the current declining socio-economic state of our nation, there is still a need for a more sustainable manner of ensuring food security for years to come.

The current method of maintaining overall social security may not be feasible in the long-run because it involves financial assistance to those who need it without necessarily implementing programmes that make them less reliant on money from the state and more self-reliant. Therefore, new initiatives that are not only limited to state funding need to be introduced. In light of this, there is a need to not undermine adult food insecurity as they are often the ones to sacrifice their nutritional intake for the sake of preventing child hunger within the household, and the loss of a breadwinner may have adverse effects on the overall food and nutrition security status of the household.

Nutrition remains a key concern in this study, where low nutrition diets appear to have become dominant in these households. The act of eating a low quality diet can be likened to eating paper, which may fill the stomach, but have limited nutritional benefits, and ultimately have negative implications for the health and wellness of household members.

Although urban agriculture may be seen as an option to alleviate urban food insecurity and increase nutrition, it should be understood that under future climate change models, urban agriculture may not necessarily be an appropriate or feasible manner of accomplishing urban household food security goals. Urban agriculture should thus not be used as a sole strategy to addressing matters pertaining to food security unless the structural challenges to urban agriculture are properly addressed and urban agriculture is used in conjunction with different strategies.

Social cohesion between urban residents and *spaza* shop owners appear to be eroding which has adversely affected communities through the limited ability to purchase food on credit, which was previously a norm. This has further exasperated social capital resulting in households being pushed into a space of limited livelihood strategies through the diversification of one type of capital known as financial capital. Whereas ‘rural’ households make use of diversified livelihood strategies through the combination of natural, social, and financial capital, and this places rural households in a better position to sustain themselves in instances of shock.

Since 1994, the South African population has been shifting to a space where a high reliance on income for food acquisition has resulted in food security becoming predominantly driven by the markets. The current directive of markets in South Africa is profit-based and this is bound to present itself as an even bigger challenge as more of the South African community advances towards a market mode of acquiring food. There is a need for policy developed around this future reality, with adequate engagement between policy makers and leading food corporations.

Finally, it is important to understand that the township is a heterogeneous setting that makes use of both informal and formal systems, because of this combination; food security will not be adequately addressed if both markets are not included in the quest towards building solutions related to urban food security. In addition, the role of the *spaza* shop owners and the vendor in the street should not be undermined in such studies as these stakeholders understand the needs and behaviours of the communities addressed in studies such as these, their input may prove to be helpful in the timely collection of information for the purpose of building solutions.

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Appendices

Appendix 1. **Household semi-structured interview.**

Section A: Demographic questions

Housing type: RDP ☐ Shack ☐ Back yard room ☐ Flat ☐

Address (for interviewer to fill in):

.....
.....
.....

1. Are you renting?

☐ Yes ☐ No

2. Age:

☐ 18 - 28 years

☐ 29 – 39 years

☐ 40 – 49 years

☐ 50 years and above

3. Gender: ☐ Male ☐ Female

4. How many years have you lived in this township?

0 Less than a year

0 1 to 5 years

0 6 to 10 years

0 10 years and more

5. What is your role in this household?

.....
.....
.....

6. Are you employed/ do you have a job?

☐ Yes ☐ No

7. Who is the person who brings the main source of income in this household?

☐ Myself ☐ Mother ☐ Father ☐ Sister ☐ Brother ☐

Other

Is anyone in the household receiving a grant?

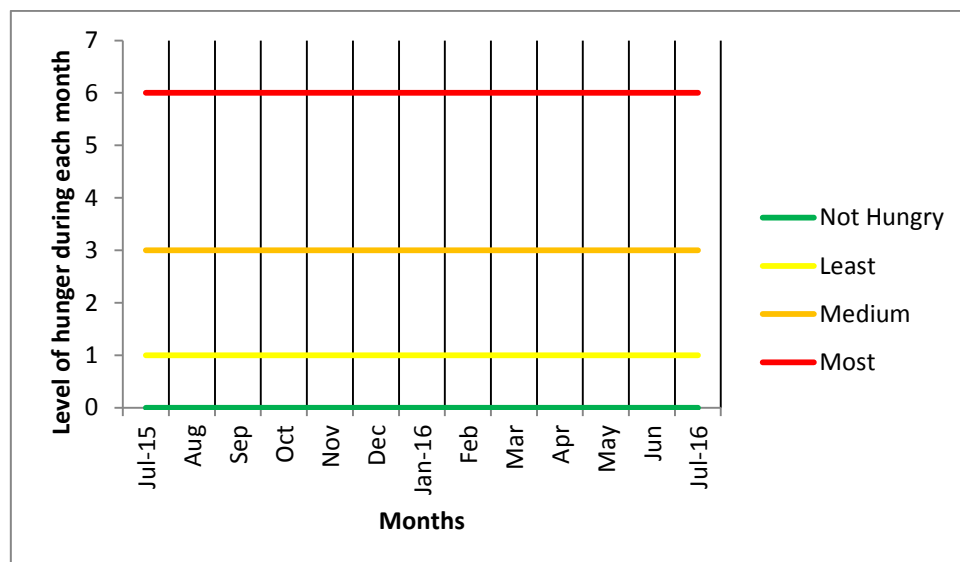
☐ Yes ☐ No

8. Where does the person who brings the main source of income work? (To determine whether the breadwinner is in the formal or informal market and further determine how this may affect food security)

9. How many people do you live with?

☐ None ☐ 1-3 ☐ 4-6 ☐ 7 >

10. Please circle the level of hunger you experienced each month (From none to hungriest) starting from July 2015 to July 2016.



Section B: HFIAS questions

1. In the past four weeks, did you worry that your household would not have enough food?

0 = No (skip to Q2)

1 = Yes

1. a. How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

2. In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?

0 = No (skip to Q3)

1 = Yes

2. a. How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

3. In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?

0 = No (skip to Q4)

1 = Yes

3. a How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

4 In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?

0 = No (skip to Q5)

1 = Yes

4. a. How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

5. In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?

0 = No (skip to Q6)

1 = Yes

5. a. . How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

6. In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food?

0 = No (skip to Q7)

1 = Yes

6. a. How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

7. In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?

0 = No (skip to Q8)

1 = Yes

7. a How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

8. In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?

0 = No (skip to Q9)

1 = Yes

8. a. How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

9. In the past four weeks, did you or any household member go a whole day and

0 = No (skip Q)

1 = Yes

9. a. How often did this happen?

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

10. What do you do to cope when you do not have enough food?

.....

.....

.....

.....
.....
.....

Do you have?

	Yes	no
Fridge		
Electric/Gas stove		
Microwave		
Motor vehicle		
TV		
Computer		
Satellite		
Radio		
Telephone		
Cell phone		

Section C: Household Dietary Diversity Survey (HDDS)

Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night.

A. Any bread, biscuits, pap, dombolo, samp, mealie rice or any other foods made from,maize, rice, wheat]?

1= yes

0 = no

B. Any potatoes, sweet potato or any other foods made from roots or tubers?

1= yes

0= no

C. Any vegetables?

1= yes

0= no

D. Any fruits?

1= yes

0= no

E. Any beef, pork, lamb, goat, wild game, chicken, or other birds, liver, kidney, gizzards, heart, or other organ meats?

1= yes

0= no

F. Any eggs?

1= yes

0= no

G. Any fresh or dried fish?

1= yes

0= no

H. Any foods made from beans, peas, lentils, or nuts?

1= yes

0= no

I. Any cheese, yogurt, milk or other milk products?

1= yes

0= no

J. Any vetkoeks, slap chips, margarine, KFC, Nandos, Hungry Lion, Chesa Nyama and any foods made with oil, fat, or butter?

1= yes

0= no

K. Any sugar or honey?

1= yes

0= no

L. Any other foods, such as spices, chutney, tomato sauce, mayonnaise, coffee, tea?

1= yes

0= no

Section D: Household finances

1. How has your spending on food changed in the past year?

1 = stayed the same (skip to Q2)

2 = increased

3 = decreased

1. a. What caused this change in your spending patterns?

.....

.....

.....

.....

.....

.....

2. Have you found it difficult to buy the food you want to buy?

1= yes (Go to question 2.a.)

2= no

2. a. Why?

.....

.....

.....

.....

.....

Where do you buy your food?

1= supermarket

2= street vendors

3 = Grow it in my back yard (Skip Question 3)

3. Have you noticed any changes in the price of food in the year (July 2015 – July 2016)?

1= yes (Go to question 3.a.)

2= no

3. a. How has it changed?

1= increased

2= decreased (Go to question 4)

4. How much of the total income goes to buying food?

1 = a quarter 2 = half 3 = more than half

5. Where exactly do you get your food from? (Should specify the name of the shop and location)

.....
.....

6. Has your income changed in the past year (July 2015 – July 2016)?

1 = Yes (Go to question 6)

2 = No

7. Has this made it easier for you to buy the food you need?

1 = Yes

2 = No (Go to Question 7)

8. If no, why not?

.....
.....

9. Which of these do you spend MORE money on than you did last year?

1 = Fruit/Veg

2 = Maize-meal

3 = Meat

4 = Bread

5 = Milk

10. How has your access to food changed in the past 4 years?

Year	Access to food (Good, bad or average)
2013	
2014	
2015	
2016	

Appendix 2. Shop sales representative/ manager/ owner exercise.

What are the main causes of the recent food price hikes? Rate them from most influential to least influential by giving them a score from one to five.

1 —————> 6

Least influential

Most influential

Drivers	Score (from 1 to 6)
The weak rand	
Drought	
Administered price increases	
Fuel price hikes	
High energy tariffs	
Other (Please specify)	

Other:

Appendix 3. Disaggregate summary statistics of the three study sites in Tembisa.

		Temong	Teanong	Ethafeni	p-value
<i>Job sector</i>	Informal/unemployed	44%	55%	62%	0.192
	formal	56%	44%	38%	
<i>Grant</i>	Yes	58%	48%	56%	0.054
	No	42%	53%	44%	
<i>Income change</i>	None	35%	22%	54%	0.023
	increased	38%	56%	28%	
	Decreased	27%	22%	18%	
<i>HH size</i>	1--3	50%	40%	56%	0.152
	4--6	42%	48%	26%	
	7+	8%	13%	20%	
<i>Dietary diversity</i>	0-3	40%	25%	28%	0.115
	4--6	52%	55%	66%	
	7+	8%	20%	6%	
<i>Food security</i>	Food secure	22%	35%	26%	0.244
	Moderately	36%	45%	44%	
	Severely	42%	20%	30%	