"Exploring the Contribution of Alternative Food Systems Towards Food Security: A Case Study of the Siyazenzela Food Garden Project"

By

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Minor Dissertation presented in partial fulfilment of the requirements for the degree of Master of Science

in

Environment, Society and Sustainability

in the

Department of Environmental and Geographical Science, University of Cape Town

September 2018

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Plagiarism Declaration

I know the meaning of plagiarism and declare that all the work in the dissertation (or thesis), save for the properly acknowledged, is my own.

Acknowledgement

I would like to thank first and foremost my Heavenly Father for His grace and mercy throughout the course of my studies. I would like to acknowledge the following:

- Professor Brian King for his unrelenting support, guidance and patience throughout this whole process. Thank you for your time and guiding comments.
- Dr Pippin Anderson for always being an essential crutch especially in times of confusion and stress.
- Siyazenzela Food Garden Project for the participation in the study.
- Thanks, are given to both my parents for their unconditional love and support.
- Special thanks to my brothers, aunt (Sepati Makgabo) and uncle (Michichi Makgabo) for their constant support, motivation and love.

Table of Contents

Tables and Figures

Figures

Tables

List of Acronyms

AFSUN- African Food Security Urban Network

AgriBEE- Agricultural Black Economic Empowerment

ANC- African National Congress

BFAP- Bureau for Food and Agricultural Policy

BSE- Bovine Spongiform Encephalopathy

CAADP- Comprehensive Africa Agriculture Development Programme

CSA- Community Supported Agriculture

DAFF- Department of Agriculture Fishery and Forestry

DOA- Department of Agriculture

DOE- Department of Education

ECOAG- Eco-agriculture

FOA- Food and Agriculture Organization

GM- Genetically Modified

LRAD- Land Redistribution for Agricultural Development

MAISP- Malawi Agriculture Input Subsidy Programme

NEPAD- New Partnership for Africa's Development's

NGO- Non-Governmental Organisation

NP- National Party

NSNP- National School's Nutrition Programme

OPV- Open-Pollinated Varieties

RISDP- Regional Indicative Strategic Development Plan

SADC- Southern African Development Community

SD- Sustainable Diets

SFSC- Short Food Supply Chain

UA- Urban Agriculture

Abstract

In South African urban centres the development of Alternative Food Systems (AFS) have been partially attributed with seeking to overcome the exclusion enforced through the apartheid regime's racial planning policies. It was during this period that poor African households were forcibly relocated to the periphery of urban areas, creating even greater distances between themselves and everyday amenities, such as food retailers, which were typically found in more affluent zones. As a result, AFS emerged through informal activities to reduce the lack of access to necessary resources that these underserved communities experienced. Even at the end of the apartheid regime and the subsequent increased expansion of formal food retailers in many of these low-income communities, access to food continues to be major challenge. Consequently, AFS fulfil an essential role by providing low income neighbourhoods with alternative and affordable sources of food. This research examines the extent to which AFS, such as the Siyazenzela food garden project, contribute to food security for the Phiri community in Soweto and if it is feasible for the project to meet these needs single-handedly. The results indicate that the project plays an important role by providing locals with accessible, fresh, diverse, affordable and culturally acceptable foods. However, one of the considerable challenges for the initiative is its inability to maintain a constant supply of produce throughout the year. This leaves many of its patrons having to seek food from other sources, which may not necessarily offer the same quality and affordable goods, or they resort to consuming less fresh produce. Therefore, the study brings to the surface the need to question how such systems function and if their methods always result in safe, healthier and environmentally friendly grown produce as the literature assert.

1. Introduction

This thesis investigates the role of Alternative Food Systems [AFS] in overcoming food security challenges especially in urban settings. Contemporary food systems are alleged to be multifaceted but more importantly they are driven by a global agenda that is said to impede the ability of people to access nutritious, safe, socially acceptable and affordable food (Johns & Sthapit, 2004; Smith *et al*, 2007; Turner, 2011). Consequently, Alternative Food Systems have sought to provide alternate forms of food production, processing, and distribution methods that some conventional food systems may not be able to provide. Much of the materials associated with Alternative Food Systems have originated from a European and American perspective, with little work being done in the Global South. The consequence is that the literature on Alternative Food Systems has underemphasised the historical racial, structural and socio-economic dynamics influencing food access and availability. As a result, this research is imperative as it contextualises Alternative Food Systems through a South African backdrop and adds to the much-needed literature from such geographical spaces.

The thesis is divided into six chapters. Chapter 2 is the literature review, which identifies and explores both the theory and practice of Alternative Food Systems. Chapter 3 presents the methodology which outlines the approach undertaken in this study and the subsequent methods used to collect data. Chapter 4 is the results chapter, in which a contextual description and analysis was carried out on the findings obtained from the research. Chapter 5 is the discussion where the major findings from the study are placed in the context of other relevant work primarily deriving from a Global South perspective. Chapter 6 is the conclusion, which highlights the potential impacts of this study and what can be learnt from it.

1.1. Aims and Objectives

The aim of this research is twofold:

1. Explore whether Siyazenzela Food Garden is an Alternative Food System
2. Explore whether Siyazenzela Food Garden Contributes towards Food Security.

To ensure all research activities were continuously steered towards answering these aims three objectives were identified and used to guide the study. These objectives are:

1. What are some of the main activities undertaken by the project?
2. In what ways does the project impact food access for residents in Phiri?
3. What are some of the challenges faced by the project in attempting to increase access to food?

2. Literature Review

2.1 Alternative Food Systems

AFS are usually defined as newly emergent systems of producers, consumers, and other food stakeholders that embody an alternative to conventional methods of food supply (Allen *et al.*, 2003; Murdoch, Marsden & Banks, 2000; Goodman, 2004; Cook, 2006; Wright, 2008). Jarosz (2008: 2) expands on this definition by stating four key features of AFS: (1) Reduce distances between producers and consumers; (2) Include smaller size farms which use organic or holistic farming methods; (3) Establish food purchasing venues; and (4) They are committed to sustainably enhancing the social, economic and environmental aspects within food systems. Sonnino and Marsden (2005) and Watts, Ilbery and Maye (2005) associate AFS with terms such as quality, transparency and locality.

These descriptions are rooted in the idea that AFS have stemmed from the need to counter the environmental impacts placed on natural systems due to conventional food production methods. For instance, existing research asserts that global agricultural practices contribute towards water pollution, loss of biodiversity and increased greenhouse gas emissions (McMichael, 2000; Bengtsson, Ahnström & Weibull, 2005; Pirog & Rasmussen, 2008; Coley, Howard & Winter, 2009; Anderson *et al.*, 2016). These concerns have pushed AFS to advocate for a much-needed paradigm shift in the operations of food systems, declaring that there needs to be greater emphasis placed on the environmental and social justice elements of food networks to limit these detrimental impacts (Power, 1999; Kloppenburg *et al.*, 2000; Altieri, 2004; Levkoe, 2006; Scherr & McNeely, 2008; Wills, Chinemana & Rudolph, 2009; Firth, May & Pearson, 2011; F.J. Li, Dong & F. Li, 2012). Consequently, AFS are said to operate along a spectrum as either weak or strong based on their social and environmental objectives, and the degree to which they may or may not

challenge modern food systems (Allen *et al.*, 2003; Watts, Ilbery & Maye, 2005; Smith & Jehlička, 2007; Guthman, 2008; Hinrichs & Allen 2008; Jarosz, 2008).

These issues have become a prominent point of debate and have influenced the continued increase of AFS in Europe and North America especially during a period known as the *turn to quality in food* (Murdoch, Marsden & Banks, 2000; Winter, 2003b; Brosnan & Sun, 2004; Feagan, 2007). The *turn in quality* came through consumers having increasing concerns about the ways the natural environment is impacted to achieve vast production outputs (Winter; 2003b). More importantly, there appears to be little concern from conventional production systems about the fact that humans are dependent on these natural systems which need to be maintained for long-term survival (O'Hara & Stagl, 2001). Many people have felt globalised and industrialised agricultural systems have homogenised production practices and sites, and a major consequence of such actions has been the risks they have put on both animals and environmental health (Jongman, 2002; Benton, Vickery & Wilson, 2003; Ekroos, Heliölä & Kuussaari, 2010; Marshall & Levy, 2011; Khoury *et al.*, 2014). This was evident through food scares such as the Bovine Spongiform Encephalopathy [BSE] pandemic and an outbreak of Foot and Mouth (Winter, 2003b). Such cases have caused a lack of trust from consumers and moreover sparked them to start interrogating the ways large food corporations seek to meet food demands (Goodman, 2004; Brunori, 2007; Goodman, 2009). Consequently, AFS are said to provide consumers with different choices instead of having to rely solely on industrialised food systems as their main source of food (Kloppenburg *et al.*, 2000; O'Hara & Stagl, 2001; Goodman, 2009; Goodman & Goodman, 2009; Jones *et al.*, 2010).

AFS vary according to scale, aims, and even the global locations in which they are carried out. Some of these include community gardens, school nutrition programmes, food kitchens, vegetable delivery schemes, Community Supported Agriculture [CSA], food-based

micro-enterprise or job training programs, home gardens, local organic produce, and farmers' markets (Ferris, Norman & Sempik, 2001; Allen *et al.*, 2003; Hamm & Bellows, 2003; Cook & Frank, 2008; Guthman, 2008; Milestad *et al.*, 2010; Paul, 2016). There are also countless participants who are involved in creating such systems, some of which include: low-income households, local representatives of community organisations, food and agriculture agencies, varying scale farmers, food banks, environmental and agricultural agencies, government departments, urban gardening forums, small and medium enterprises involved in food processing and retailing, and parks and recreation officials (Rogerson, 1993; Garrett & Feenstra, 1997; Irvin, Johnson & Peters, 2007; Halprin, 2008; Thornton, 2008; Bundy *et al.*, 2009; Sonnino, Torres & Schneider, 2014).

In considering some of the potential benefits associated with AFS there have been some concerns generated through their uptake. Mount (2012) and Blake, Mellor, and Crane (2010) have noted that in some cases only certain people can partake in AFS, primarily those who have the financial capabilities to do so. For instance, farmers who have resources required to convert to organic farming practices, or the ability to travel to farmers markets and initiate a produce delivery scheme. Due to some of the unequal resource distribution and racial inequality experienced in some countries, AFS have been viewed as a movement dominated by white farmers and their presence has been termed as the "Whiteness in the Alternative" movement (Alkon & McCullen, 2011). In addition, those who can partake in these activities are said to be able to cater to an elite niche market that can afford these higher qualities and sustainably grown produce (Slocum, 2006; Guthman, 2008). Other authors have gone further to critique the assumption that some AFS actions can reduce food miles and thereafter Green-House Gas emissions. As a result, the use of analytical tools such as life cycle assessment have been suggested to quantify if localised food production results in reduced emissions in comparison to food transported from afar (Garnett, 2004; Saunders &

Barber, 2008; Weber & Matthews, 2008). For instance, life cycle assessments have the potential to bring to the forefront poorly understood elements of local production systems such as direct emissions from inputs (i.e. fertiliser, pesticides, electricity or machinery), or those deriving from local conditions such as CO_2 release from the soil, or how emission variations can fluctuate between seasons and different crops growing on the same site (Edwards-Jones *et al.*, 2008). Therefore, in light of these complexities it is important to challenge the assumption that all AFS are more inclusive, ethical and environmentally conscious as opposed to industrialised food systems (Sundkvist, Milestad & Jansson, 2005).

Another component of AFS that requires further attention is how their operations vary across geographical settings. AFS in developing countries have to a degree established themselves to counter forms of exclusion experienced due to social, political, economic and environmental factors. In the Global South, AFS have been branded as "the entire food supply that, in part or in full, contests or opposes the dominance of the conventional food networks in urban areas" (Abrahams, 2006: 6).The supply of food to Southern Africa's urban centres have been categorised by an increasingly developed and sophisticated food marketing system on the one side, and a well ordered informal food marketing system on the other (Louw *et al.*, 2008).

The industrialisation of food systems has become increasingly present within developing countries with such patterns evident through the rise of supermarkets (Neven *et al.*, 2006; Tschirley, 2007; Abrahams, 2009; Crush & Frayne 2011). For instance, in Latin America it has been estimated that the growth rate of supermarkets stood between 10%- 20% in 1990 and had increased starkly to 50%-60% by the year 2000 (Reardon & Berdegué, 2002; Reardon, Berdegué & Farrington, 2002; Balsevich *et al.*, 2003; Reardon et al., 2003; Amekawa, 2009). In East and Southeast Asia, comparable rates of development have occurred in line with the Latin American region, though it is said to continue at faster levels

(Reardon *et al.*, 2003; Reardon, Timmer & Berdegué, 2004; Reardon, Timmer & Berdegué, 2005). As noted by Reardon *et al.* (2003: 1142): "The most recent venue for supermarket take-off is in Africa, especially in Eastern and Southern Africa. South Africa is the frontrunner, with roughly a 55% share of supermarkets in overall food retail." Even with this sector continued development in South Africa it continues to be dominated by white male farmers and white-owned companies (Walker, 1998; Reardon *et al.*, 2003; Louw *et al.*, 2008; Fukuda-Parr & Taylor, 2016).

Much of this expansion has been catalysed by urbanisation and the rise of the middle class in South Africa; however, recently many of these food retailers have unprecedentedly expanded into low-income residential areas and rural spaces as well (Weatherspoon & Reardon, 2003; Bureau for Food and Agricultural Policy [BFAP], 2006; Woodward *et al.*, 2011; Battersby & Crush, 2014). In addition, these retail facilities have become even more popular due to the rise of refrigeration ownership, which allows consumers to purchase and safely store larger quantities of goods (Woodward *et al.*, 2011). To demonstrate the importance of supermarkets for poor urban households a survey was carried out through the years 2008-2009 by the African Food Security Urban Network [AFSUN]. This survey was intended to establish a baseline for food security in 11 cities within 8 SADC countries (Frayne *et al.*, 2010). Its findings concluded that up to 76% of poor households purchased parts of their food from supermarkets, and these spaces tend to fulfil an important role in comparison to the other major purchasing facilities such as the informal sector and fast food outlets (Frayne *et al.*, 2010). However, it is important to note that access to these retail spaces differ from city to city. "Supermarkets are used by the greatest proportion of households in the large cities of South Africa; over 90% in Johannesburg, Cape Town and Msunduzi (Pietermaritzburg). The degree of supermarket penetration and patronage in other countries and cities varies considerably, from 53% of households in Blantyre, 30% in Harare, 23% in

Maputo and a low of only 14% in Lusaka." (Crush & Frayne, 2011: 27). Even with supermarkets increased presence in poor urban areas and providing residents with cheaper priced food this does not automatically equate to improved food security. Therefore, alternative forms of supply are required to overcome or even mitigate some of the shortfalls of formal food supply systems.

The opportunities for AFS within developing countries are shaped, at least in part, by historical political and economic systems that influenced their efficiency. Prior to the expansion of retail growth in South Africa, the racially driven apartheid regime enforced a planning system that placed poor households on the outskirts of urban areas far from necessary everyday amenities. This made it difficult for residents to access food from supermarkets or other retailers which were typically located in more affluent centres (Davies, 1981; Lemanski, 2004; Battersby, 2012; Battersby & Peyton, 2014).

It was during this same period that the ruling National Party [NP] had put in place legislation which sought to intentionally undermine the needed provision of food especially in the racially-established townships (Wylie, 2001 cited in Koch, 2011: 2). For instance, "the school feeding scheme was necessary because of the deterioration of physiques among the African children attending school but resisted it because it reduced parental responsibility and caused dependence" (Koch, 2011: 2). Such conditions ultimately caused and pushed many of these underserved communities to find alternative forms of food supply. As a result, a solution came through the informal economy and its activities that occurred within hidden places throughout urban spheres, to hide detection from the government who sought to repress these actions (Rogerson, 2000; Pick, Ross & Dada, 2002; Popke & Ballard, 2004; Etzold *et al.*, 2009). In urban zones these actions were identified through the growth of informal street traders (hawkers/vendors), spaza shops (residential homes with shops attached

to them), survivalist community-based organizations, urban agriculture, public markets and small convenience stores (Rogerson, 2000; Habib, 2005; Igumbor *et al*., 2012).

The end of the apartheid regime in 1994, enabled supermarket growth throughout the country and provided customers with products at cheaper rates per unit. However, despite this expansion, low-income communities within urban areas continued to experience the lowest ratio of supermarkets per square kilometer in comparison to more prosperous residential areas (Igumbor *et al*., 2012; Peyton, Moseley & Battersby, 2015). Moreover, there continues to be additional factors that impede many poor urban residents from accessing food through formal retail facilities such as rising inflation, stagnant income, and higher public transport costs (D'Haese & Van Huylenbroeck, 2005; Battersby, 2012; Rudolph *et al*., 2012). Therefore, the informal sector fills an important role for many urban households accessing food by providing spatial accessibility, affordable pricing, suitable quantities, and access to credit (Rudolph *et al*, 2012; Skinner & Haysom, 2016). Additionally, unlike many commercial retailers the informal sector caters to the cultural and religious food preferences of many urban residents which are deeply ingrained in their everyday consumption patterns (Gockowski *et al*., 2003; Van Huis, 2003; Bhowmik, 2005; Abrahams, 2006; Abrahams, 2008).

AFS in South Africa operate within both formal and informal sectors. For instance, some peri-urban farmers in Johannesburg sell their produce in both formal residential areas and residents from informal settlements, whilst others possess both the quantity and quality of produce required to supply formal retailers, but instead choose to serve their immediate community (Hughes, 2005; Abrahams, 2006). Consequently, some authors have cautioned against the contention that AFS are completely against conventional food systems, but rather that they are in fact interlinked and to an extent dependent on them in some cases (Feenstra,

1997; O'Hara & Stagl, 2001; Campbell, 2004; Bratton, 2007; Goodman, DuPuis & Goodman, 2012; Blay-Palmer *et al.*, 2013).

Defining these systems in Africa and understanding how they develop and operate in their specific spaces depends largely on context (Ericksen, 2007; Kneafsey *et al.*, 2013a). As a result, a case study analysis is imperative when trying to understand AFS because it can assist in drawing out key processes, features and structures unique to each AFS in a location (Sage, 2003a; Ilbery & Maye 2005; Maxey, 2006; Follet, 2009; DeLind, 2011). In this research, the case study of the Siyazenzela Food Garden Project in Phiri, Soweto is used to explore if the initiative functions as an AFS and the extent to which it can support household food security. It is expected that by exploring AFS through this study a better understanding of how these systems unfold in the Global South will be gained and further highlight the complexities they encounter in attempting to improve access to food.

2.2. Theories

It is important to note that a considerable amount of AFS work has primarily been focused on material impacts as opposed to developing complex theoretical ideas. Some scholars have argued this leaves the AFS concept underdeveloped (Goodman, 2004; Maye & Kirwan, 2010). However, there have been two theoretical streams in which AFS are rooted, specifically social embeddedness and short food supply chains.

2.2.1. Social Embeddedness

Several scholars, farmers, and policymakers have been troubled that globalised food systems continuously disembed themselves not only from social, economic and environmental elements within their systems but more importantly from their consumers (Allen *et al.*, 2003; Feagan, 2007; Hinrichs, 2000; Hinrichs, 2003; Sage 2003b; Winter 2003a). Consequently, the emergence of social embeddedness in AFS provides a useful framework that promotes a reworking of agricultural activities. This is done through reducing

the distorted and increased distances (physically, socially and metaphorically) between growers, processors, and consumers, and ensuring alternative activities are underpinned by principals of reciprocity and trust (Renting, Marsden & Banks 2003; Sage, 2003b; Feagan & Krug, 2004; Follett, 2009; Forkes, 2011).

Though, some authors have cautioned against the concept of social embeddedness primarily arguing that the idea emphasizes social elements over economic ones and such a stance may not be beneficial for AFS and their long-term progress (Granovetter, 1985; Krippner, 2001).

2.2.3. Short Food Supply Chain [SFSC]

The concept of SFSC has been useful in understanding the ways in which food is supplied through alternative channels (Maye & Kirwan, 2010). For the most part, SFSC activities are oriented towards establishing direct links between farmers and consumers while attempting to counter some of the negative patterns formed through industrialised food distribution (Ilbery & Maye, 2005; Abatekassa & Peterson, 2011; Bimbo *et al.*, 2015). SFSC manifest themselves through two key methods: physical proximity and spatiality extended supply chains. Physical proximity is intended to increase connections between consumers and producers through various actions. This may be accomplished through eliminating the number of intermediates/middlemen involved in the exchange of goods, reducing the distance used to transport food (food miles' concept), or even distance between place of production and where input resources are obtained (Galli & Brunori, 2013; Aubert & Enjolras, 2015; Moustier & Renting, 2015). Spatiality extended supply chains, occur when food is exported from a region and information about its origin, production process or producers are given to consumers. The main methods of communicating such information can be witnessed through branding, labelling and certification (Marsden, Banks & Bristwo, 2000; Renting, Marsden & Banks, 2003; Ilbery *et al.*, 2005; Kneafsey *et al.*, 2013b).

SFSC occur through several activities such as farmer's markets, direct sales through on-site shops or vegetable box delivery schemes (Redman, 2010; Kneafsey *et al.*, 2013b; Bimbo *et al*, 2015). It is important to note that even in considering such examples "every SFSC has its own pattern where the social relation of exchange, as well as economic ones, and the attention on environmental issues look different, because various are the purposes of people involved" (Mastronardi *et al.*, 2015: 110).

However, it has been warned that SFSC tend to assume that the beginning of any supply chain is from the producers, unfortunately this means they overlook the upstream dimensions of the system like not understanding where producers source their input resources (Maye & Kirwan, 2010). This oversight may result in questioning the credibility of the alternativeness of local food products especially if inputs are sourced from outside the local vicinity or mainstream suppliers. Therefore, it has been suggested that a 'whole chain approach' is needed when exploring AFS (Ilbery & Maye, 2005; Maye & Kirwan, 2010).

2.3. State of Food Security in South Africa

The definition of food security is the ability (both physically and economically) for individuals and households to reliably acquire food that is nutritious, safe, and of good quality through socially acceptable methods (Gross *et al.*, 2000; Crush, Hovorka & Tevera, 2011; Labadarios *et al.*, 2011; Kneafsey *et al.*, 2013a).

However, one of the major challenges with this definition is that it takes a very broad approach in dealing with food security and has drawn governments to view it as an issue which predominantly plagues rural households. Consequently, dealing with food security from such a stance has been termed as a rural bias as major focus and efforts are drawn to these areas more than others (African Union, 2003; Chilonda & Minde, 2007; Roberts, 2007; Crush & Frayne, 2010b; Crush & Frayne, 2011).

A similar approach has been taken on by the South African government, as even after identifying the primary features said to contribute towards food insecurity which include: "Inadequate Safety Nets, Weak Institutional Support Networks and Disaster Management Systems, Inadequate and Unstable Household Food Production, Lack of Purchasing Power, and, Poor Nutritional Status" (Department of Agriculture [DOA], 2002: 2) within the Integrated Food Security Strategy document. A very rural oriented solution continues to dominate, as witnessed through the development of the Land Redistribution for Agricultural Development [LRAD] and Agricultural Black Economic Empowerment programmes [AgriBEE], which both intend to deal with the unequal distribution of land and simultaneously improve agricultural skills, resources and infrastructure (Gray, 2004; King, 2005; Bradstock, 2006; Olubode-Awosola & Van Schalkwyk, 2006; Lebert & Rohde, 2007; Lepheane, 2007; Bbun & Thornton, 2012; Madletyana, 2012; Tshilowa, 2015).

Even with these actions taken up by the government the literature increasingly asserts that the definition of food security should be reworked, in order to be contextually based and allows for a greater appreciation of how local interactions influence food pattern behaviours in specific spaces (Godfray *et al.*, 2010; Karanja *et al.*, 2010; Voorend *et al.*, 2012; Lynch *et al.*, 2013). Such a definition has been provided through the FAO (2002: 1) which states that food security "exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life." The inclusion of the terms "safe and nutritious" advocate that the food consumed should be safe and add nutritional value. Additionally, the use of terms "food preference" argue that it is not sufficient to have access to enough food but if it is preferred foods there is a greater chance of improving consumption patterns and subsequently food security (Pinstrup-Andersen, 2009). Understanding food security through this new perspective is said to encourage a greater appreciation of how locally based socio-economic

forces contribute towards residents procuring healthy and culturally acceptable/preferred food (Bellows & Hamm, 2002; Cohen, 2002; Short, Guthman & Raskin, 2007). This shift has allowed a closer exploration of how food patterns unfold in urban spheres, mainly through the concept of urban food security (Frayne *et al.*, 2009).

Working from such definition, it has been estimated that between 2000 and 2030 Africa's urban population is expected to rise by 367 million and its rural population by 147 million. These increases will result in Africa's urban residents outnumbering rural inhabitants with figures standing at 579 million versus 552 million by 2030 (Kessides, 2006). With clearly more mouths to feed in the future some authors have maintained that the concepts surrounding urban food security continue to be invisible and not prioritised (Crush & Frayne, 2010a). Maxwell (1999) argues that this invisibility is due to three explanations. The first is that, in many cases, urban policy makers have limited budgets to work with and consequently much of this funding is redirected towards more urgent and visible urban challenges such as infrastructure (Maxwell, 1999). The second argument is that unlike rural communities where food insecurity can be linked to environmental changes like famines, urban food insecurity occurs at a household level where residents employ several localised coping strategies to overcome some of these shortages and this can make urban food insecurity difficult to observe (Maxwell, 1999). The third argument is that due to the belief that food insecurity and poverty are primarily rural problems, it can sometimes be challenging for policy makers to see it as an issue with similar features in urban environments (Maxwell, 1999).

Other factors said to contribute to urban food insecurity include the fact that "food insecurity is the result of the interplay between household and extra-household factors" (Battersby, 2012: 146). For instance, most urban households especially those who are poor must purchase their food. Such reliance on formal and informal food retailers can make households vulnerable to fluctuating food prices (Watkinson & Makgetla, 2002; Cohen &

Garrett, 2009; Crush & Frayne, 2011). Therefore, household income plays a major role with regards to not only the ability to access food, but the quality of foods purchased. It was estimated that the monthly income for poor households in South Africa stands at less than R1000, and on average an adult would require R9.55 a day or R286.50 a month to maintain a healthy diet (Bonti-Ankomah, 2001; Labadarios *et al.*, 2011). Most households in South Africa have a minimum of four members and they would need at least R38.20 a day or R1146 per month to maintain a healthy diet.

This becomes even more difficult with poorer households where having six or seven members is common and this results in even less money available for healthy food to be purchased (Lehohla, 2001; Lehohla, 2004; Statistics South Africa, 2001; Statistics South Africa, 2004; Pirouz, 2005). For many of these poor households, convenience foods sometimes take priority over healthy and nutritious options (Gorstein *et al.*, 1994; AC Nielsen, 2006 cited in Biénabe, Vermeulen & Bramley, 2001; Faber & Wenhold, 2007). These unhealthy foods, which are low in fibre but contain increased saturated fats, preservatives and highly refined sugar, are often preferred because of their affordability and the fact they are easily accessible in many low-income neighbourhoods. Nonetheless, these eating patterns have brought about issues concerning overnutrition and their contribution towards diseases such as obesity and diabetes (Bourne, Lambert & Steyn, 2002; Puoane *et al.*, 2002; Jinabhai *et al.*, 2007). As a result, some authors argue that not only is government intervention needed to raise awareness about the importance of eating healthier foods but there needs to be initiatives aimed at improving their prices to potentially change consumption patterns in low-income households (Drewnowski, 2004; Drewnowski, Darmon & Briend, 2004; Drewnowski & Darmon, 2005; Jetter & Cassady, 2006; Drewnowski *et al.*, 2007).

2.4. AFS and Production Systems

The following sections outlines some of the complex ways AFS unfold through production systems. As noted by several authors such as Oettle *et al*. (1998), Altieri (2009) and Greenberg (2011), AFS seek to encourage the use of local resources and knowledge in the production of food. This is to ensure that some level of self-sufficiency is established within communities and potentially improve the quality of produce grown (Bolund & Hunhammar, 1999; Vergunst, 2002; Sundkvist, Milestad & Jansson, 2005; Fraser, 2006; Koohafkan, Altieri & Gimenez, 2011; Go´mez-Baggethun *et al.*, 2012).

2.4.1. Urban Agriculture

One of the ways AFS activities have materialised in developing countries has been through urban agriculture [UA]. UA is defined as the practice of producing, processing and marketing of food within or around the periphery of urban centres (Quon, 1999; Zezza & Tasciotti, 2008; Mkwambisi, Fraser & Dougill, 2011). These activities may include livestock husbandry, plant production, horticulture, aquaculture or forestry, and are usually undertaken for marketing purposes or as a strategy to mitigate household food shortages (Zezza & Tasciotti, 2010; Vagneron 2007). UA can be carried out on countless spaces including rooftops, household backyards, communal spaces, public and private land, river banks or in parks (Egziabher, 1994; Cofie, van Veenhuizen & Drechsel, 2003; Drechsel & Dongus, 2010; Mougeot, 2010).

In South Africa, there have been some policies, such as the "White Paper on Agriculture, White Paper on a National Water Policy for South Africa and White Paper on Spatial Policy and Land Use Management" (Thornton, 2008: 5), that promote the use of UA as a strategy to deal with poverty alleviation, increase urban food production and bring healthier goods near residents (Van der Merwe, 2003; Van Averbeke & Mohamed, 2006; Ambrose-Oji, 2009). The practice of UA in South Africa is usually undertaken by the elderly,

unemployed, retired, and women headed or poor urban households (Rogerson, 1993; De Zeeuw cited in Rogerson, 2003; Thornton, 2008; Bbun & Thornton, 2013). UA ensure groups of people who are not necessarily part of the normal, able bodied working class acquire foods through accessible channels.

Current UA activities and programmes in South Africa were partially initiated in the late 1970's and early 1980's, as a symbol of resistance against the apartheid regime. This was and continues to be achieved through assistance from Non-Governmental Organisations [NGO], local government, and national departments and corporate social investment programmes. All of whom are determined to ensure communities in urban environments become self-sustaining in order to overcome urban poverty, food insecurity and malnutrition (Rogerson, 2003; Geyer *et al.*, 2011; Swanepoel, Van Niekerk & D'Haese, 2017). However, there have been some contrasting arguments as to alleged benefits of UA contributing to household food security and the actual number of people who partake in these endeavours. Some authors have contended that the uptake and practice UA in South Africa is insignificant in comparison to other African countries, and this might be due to many households having access to other means of social support such as social grants (Van der Merwe, 2003; Thornton & Nel, 2007; Burger *et al.*, 2009). Whilst on the other hand other literature celebrates and highlights the importance of UA practices for certain households. For instance, Rogerson (2003: 133-134) notes: "The nutritional benefits of urban agriculture for such vulnerable groups may be considerable. It can make available cheap fresh vegetables and other perishable crops, lowering their cost and increasing their availability, in addition to improving the microcontent of the diets of the poor." There have been some studies which have demonstrated that if agriculture activities are brought closer to households and the wider community there is a greater chance of improving nutritional intake, altering attitudes towards agricultural actions and increasing the consumption of vegetables and fruits (Faber,

Witten & Drimie, 2011; Masset *et al.*, 2012; Laurie, Faber & Maduna, 2017). However, it has been argued by Girard *et al.* (2012: 206) that "these strategies do little to combat the primary causes of poor micronutrient status, namely inadequate food intake because of chronic or acute food insecurity, high burdens of infectious disease, and social bias against women and children."

It has been maintained by some authors that UA has the potential to encourage sustainable resource use and improve environmental conditions such as microclimate improvements, conserving urban soils, waste and nutrient recycling, water management and increased biodiversity (Deelstra & Girardet, 2000; Mougeot, 2000; Howorth, Convery & O'Keefe, 2001). For instance, UA farmers may recycle animal and industrial waste from local resources and use them as inputs for their systems (Altieri *et al.*, 1999; Deelstra & Girardet, 2000; Cofie *et al.*, 2006; Cofie, Bradford & Dreschel, 2006; Pearson, L.J, Pearson, L & Pearson, C.J, 2010). In doing so, UA activities are said to transform once unsanitary and unhealthy sites such and dumping grounds or vacant land into healthy and productive spaces (Altieri *et al.*, 1999; Novo & Murphy, 2000; Slater, 2001).

However, some scholars have put forward concerns relating to urban food production and the impact they could have on human health. For instance, crop exposure to pollutants such as exhaust fumes from vehicles and factories, or land which is contaminated by waste water or untreated sewage, can lead to heavy metal uptake by certain crops, which if not treated may result in some metal transfer during consumption (Brown & Jameton, 2000; Agrawal *et al.*, 2003; Wei & Yang, 2010; Nabulo *et al.*, 2012). An additional, concern is the use of animals in urban spaces because of potential zoonotic risks if they are not handled correctly (Mougeot, 2010).

One of the other major threats to UA is associated with land tenure. The importance of linking secure land tenure and food security was summarised by Maxwell and Wiebe

(1999) who noted that: "Where land and food are explicitly conceptualised together, they generally fall within a linear framework that begins with access to resources and proceeds casually through, production, income generation, and consumption to nutrition status" (Maxwell & Wiebe, 1999: 829). Consequently, the nature of tenure can sometimes influence the ways farmers decide to invest in land and whether to use its resources sustainably (Adams, Sibanda & Turner, 1999). Furthermore, without secure tenure UA could be at risk as its land may be sought by government or potential investors to be used for more lucrative alternatives (Mbiba, 2000; Place, 2009).

2.4.2. Agro-ecology/Organic farming and Eco-agriculture

As noted previously, one of the fundamental goals of AFS is to produce food in a sustainable manner but more importantly doing so in the urban environment could ensure long-term food supply for many of its poor residents. One of the suggested ways of achieving such an outcome has been through the practice of agro-ecology. Agro-ecology has origins in traditional/indigenous farming systems which were, and continue to be, practised by disadvantaged farmers, especially by those who do not have access to mechanised tools/equipment, chemical fertilisers, pesticides and other modern agricultural inputs used in conventional farming systems (Altieri, 1989; Altieri & Hecht, 1990; Rosset & Altieri, 1997; Altieri, 2002).

Agro-ecology intends to enhance ecosystem services primarily through provision (i.e. materials generated from ecosystems like food, water, timber) and regulatory mechanisms (i.e. climate, soil nutrient cycle, or hydrological cycles) (Kaihura & Stocking, 2003; Niemelä *et al.*, 2010; Bommarco, Kleijn & Potts, 2012; O'Farrell *et al.*, 2012). This is achieved mainly "by integrating natural and regenerative processes, such as nutrient cycling, nitrogen fixation, soil regeneration and natural enemies of pests into food production processes" (Pretty & Hine, 2001: 10). Agro-ecology can take place on several systems both natural and managed

for instance natural pastures, rangelands, croplands, agroforests and managed plantations (Powell & Williams, 1993; Charudattan, 2001).

Field examples of such agro-ecological practices include the intercropping of nitrogen fixating crops in and amongst other plants such as beans planted with maize, pumpkin with potatoes and cereals or maize with pigeon peas (Altieri & Merrick, 1987; Malézieux *et al.*, 2009; Ngwira, Aune & Mkwinda, 2012). Such intentional planting is also referred to as planned biodiversity because certain plants strategically fulfil several environmental roles such as performing pest management strategies, improving nitrogen fixation capabilities or even attracting essential micro-organism such as earthworms (Kogan, 1998; Thrupp, 2000; Cook, Khanand & Pickett, 2007; Malézieux *et al.*, 2009; Ayuke *et al.*, 2012). Another practice used to improve local growing conditions includes mulching (Giller *et al.*, 2009; Derpsch & Friedrich, 2010; Khan *et al.*, 2010). This is when previous organic crop residue or even living crops (i.e. pumpkins and beans) are either placed or allowed to grow freely above the soil (Hobbs, 2007; Gupta & Sayre, 2006; Malézieux *et al.*, 2009). The mulch acts as a cover from harsh environmental conditions, helps maintain moisture, and when the plants decompose add nutrients back to the soil (Giller *et al.*, 2009; Garrity *et al.*, 2010; Thierfelder & Wall, 2010; Valbuena *et al.*, 2012).

Even with the potential environmental benefits associated with such production systems there are those who have suggested that an additional alternative is needed that not only looks to safeguard wild species but increase productivity and reduce poverty. Eco-agriculture [ECOAG] is one additional substitute that has been considered. "ECOAG promoters affirm that the best way to reduce the impact of agricultural modernization on ecosystem integrity is to intensify production in order to increase yields per hectare, and in this way spare natural forests from further agricultural expansion" (Altieri, 2004).

For the African continent, ECOAG has been demonstrated through the New Green Revolution where the use of hybrid seeds and plants, Genetically Modified [GM] crops, herbicides, fertilisers and pesticides are encouraged to increase crop production (Daño, 2007; Toenniessen, Adesina & DeVries, 2008; Sanchez, Denning & Nziguheba, 2009; Pretty, Toulmin & Williams, 2011; Liu *et al.,* 2014). There have been some cases demonstrating how such practices have been able to increase food production in some African countries (Quiñones, Borlaug & Dowswell, 1997; Denning *et al.*, 2009; Vanlauwe *et al.,* 2011).

However, there has been limited uptake of ECOAG by some farmers due to difficulties experienced in purchasing the resources required for such systems, and potentially inadequate knowledge as to how to use them effectively (Duflo, Kremer & Robinson, 2008). As a result, some governments have put in place measures such as extension workers and subsidy programmes that are intended to overcome some of these shortcomings (Davis, 2008; Dorward & Chirwa, 2011; Bbun & Thornton, 2013). Other concerns put forward with the use of ECOAG is that in some cases the excessive use of many of these resources can have detrimental effects on the environment. For instance, the use of GM species which are not native to a given area can become an invasive problem potentially causing a loss of local species and subsequently the surrounding biodiversity (Gurevitch & Padilla, 2004; Keller, Mndiga & Maass, 2006; Lundgren *et al.,* 2009). Such factors put into perspective the need to evaluate these systems and question that if they can provide more food and at what cost should this be done.

2.4.3. Consumer Demands for Sustainable Diet

The points outlined above can be understood as actions used to enhance local production environments from a farmer's point of view. However, it is important to note that from the other end of the spectrum consumers either knowingly or unknowingly can influence the forms of production practices that are carried out in

agricultural systems. The growing uptake of Western diets all over the world through globalised food systems have created more homogenised eating patterns. This is evident through simplified diets that are less nutritious than diverse or traditional types (Kuhnlein & Receveur, 1996; Pingali, 2007; Cadilhon *et al.*, 2006). These growing changes in dietary choices have partially resulted in a disconnect between people and their food (Drechsel & Dongus, 2001). Many people have limited knowledge as to how and where their food is produced, and so there is less of a need to understand how these methods impact on the wider environment and the quality of food they consume (Reijnders & Soret, 2003; Macdiarmid *et al.*, 2012; Macdiarmid, 2013; Auestad & Fulgoni, 2015).

For instance, the increased demand in Western diets has resulted in greater consumption of meat, dairy, oil, salt and processed foods especially in developing countries (Walker *et al.*, 1992; Bourne, Lambert & Steyn, 2002; Popkin, Lu & Zhai, 2002; Popkin, Adair & Ng, 2012). Often meeting such demands has meant clearing once biodiverse spaces, and replacing them with non-native, domesticated plant varieties and animals in order to fulfil specific food requirements (Goodland, 1997; Burlingame & Dernini, 2012; Nijdam, Rood & Westhoek, 2012; Macdiarmid, 2013; Sáez-Almendros *et al.*, 2013; Tilman & Clark, 2014) Furthermore, these continued diet choices put more pressure on other natural resource stores and energy sources; for example, the continued increase in greenhouse gas emissions, stress and constant competition of limited fresh water reserves, and degradation of soil resources as a result of over exploitation and mismanagement (Reijnders & Soret 2003; Van Bommel & Spicer, 2011; Macdiarmid *et al*, 2012). There is a clear bi-directional relationship between people and ecosystems. Ecosystems provide services that enable the production of food for consumption; however, food preferences can positively or

negatively influence how these services are used and managed (Allen *et al.*, 1991; Johns & Eyzaguirre, 2006; Smith, 2006; Allen *et al.*, 2014; Johnston, Fanzo & Cogill, 2014).

One approach endorsed by AFS as a potential solution in overcoming some of the negative impacts diet choices can have on production systems has been through the notion of Sustainable Diets [SD]. SD fall in line with the AFS agenda as they look to "promote environmental and economic stability through low-impact and affordable, accessible foods, while supporting public health through adequate nutrition. Importantly, sustainable diets help promote sovereignty and preserve tradition involving culturally sensitive and acceptable foods" (Johnston, Fanzo & Cogill, 2014: 420).

One of the major fundamental traits of SD is that they encourage the belief that local and traditional food preferences need to be incorporated into production systems as a way of improving healthy food consumption patterns (Schmidhuber & Tubiello, 2007; Ericksen, 2008; Pinstrup-Andersen, 2009; Chakraborty & Newton, 2011). For instance, some studies and authors have confirmed the large role traditional green leafy vegetables play in many Sub-Saharan households. They assert the notion that through these crops households can supplement their starchy meals with essential nutrients, and especially when there are little or no funds to purchase protein sources such as meat (Van der Walt, 2005; Van der Walt *et al.*, 2006; Van der Walt *et al.*, 2009; Van Der Walt, Ibrahim & Bezuidenhout, 2009). Therefore, they should be cultivated at greater quantities to increase consumption and contribute towards improving health standards in the region (Steyn *et al.*, 2001; Faber *et al.*, 2002; Modi, Modi & Hendriks, 2006; Odhav *et al.*, 2007; Afolayan & Jimoh, 2009).

Building on the premise of sustainability, those who support SD see it as a tool that encourages the production of food using local resources in a manner that can potentially enhance the biodiversity in a given area, whilst meeting current food needs and without compromising those of future populations (Frison *et al.*, 2006, Johns & Eyzaguirre, 2006; Edwards-Jones, 2010). For some authors increasing local biodiversity is an essential part of a sustainable diet as it can enable a greater variety of species, especially those adapted to a specific geographical location, to thrive and thus provide adequate quantities for consumption (Worm & Duffy, 2003; Long, Bruno & Duffy, 2007; Striebel, Behl & Stibor, 2009; Heywood, 2011). Furthermore, increased biodiversity would lessen the need for harmful and/or costly external and artificial inputs that would usually be needed for more domesticated plant and animal species (Heywood, 2011).

To achieve such changes, an important element of SD is that they seek to inspire diet behavioural changes. These changes are intending to raise awareness about the close link between consumer consumption patterns and food production systems (Kollmuss & Agyeman, 2002; Bamberg & Moser, 2007; Heller & Keoleian, 2014). It is hoped that by educating the public on how their food choices impact the environment they can be transformed into conscious eaters (Sassatelliand & Davolio, 2002; Gaytán, 2004; Pietrykowski, 2004; Schneider, 2008). However, some authors have argued that changing consumer behaviour is not feasible without understanding other factors which influence food choices. One way of looking at factors that may influence food choices is through the concept of the "food environment". The food environment describes how characteristics such as the availability, affordability, convenience, and desirability can affect household consumption patterns (Herforth & Ahmed, 2015; Powell *et al.*, 2015). Without grasping how these aspects may be

interconnect or conflict with one another could make it challenging for people to engage in behavioural changes to achieve a sustainable diet (United Nations Assembly, 2015; FAO, 2016)

2.5. Alternative Food Supply Systems

2.5.1. Informal Food Supply

The importance of the informal sector in supplying food within urban vicinities was highlighted by Etzold *et al.* (2009: 4) who stated that "informal activities due to their flexibility and the self-organised mode of their practice are decisive for the functioning, efficiency and resilience of mega urban food systems." In Sub-Saharan Africa, the informal sector positions itself as an essential part of the economy, providing an estimated 78% of non-agricultural employment, 93% of all new jobs created, and 61% of urban employment (Kessides, 2006). For South Africa, the supply of food through informal activities enables sellers to engage with patrons through a variety of platforms. For instance, the selling or purchasing of food can occur on: commuter trains, direct door sales, informal markets, street and pavement stalls, using informal networks such as family and friends, at social grant payment centres or at local shops knows as spazas/tuck-shops (Madevu, 2006; Madevu, Louw & Kirsten, 2007; Ortmann & King, 2007; Skinner, 2008a; Skinner, 2008b; Weinberger & Pichop, 2009; Crush & Frayne, 2010a; Mahlangu, 2014). Many of these alternative supply routes tailor themselves in accordance to the needs of their respective communities. Moreover, they do not always operate independently of each other but can overlap as customers can access them according to their specific requirements (Battersby, 2012). Although the goods supplied through this sector are higher priced than those sold in supermarkets, the informal sector continues to fulfil an essential role for urban poor households by increasing access to food through its

flexibility and increased proximity to patrons (Neven *et al.*, 2006; Minten, & Reardon, 2008; Altman, Hart & Jacobs, 2009; Crush & Frayne, 2010a; Mthombeni, 2013; Battersby & Crush, 2014).

Some authors have gone further to argue that if fresh food is brought nearer to many of these disadvantaged urban communities for instance through fresh produce stalls or farmers markets, there is a greater chance of consumption and local diets improving (Fisher, 1999; Glanz & Yarocj, 2004; Robinson, 2008; Markowitz, 2010). One of the chief features of the informal food marketers in Southern Africa's urban zones is their ability to be mobile not only within but also between cities (Crush & Frayne, 2010a). Through these activities consumers have had produce brought closer, and producers can tap into higher income groups and generate more money through direct sales (Fonteneau & Develtere, 2009; Thom & Conradie, 2012; Thom & Conradie, 2013).

It is important to note that although the informal sector plays an important role in supplying urban households with food, they do so through interacting with the formal sector to some degree. For instance, informal food marketing systems may source some of its processed and fresh products from formal systems (Neven & Reardon, 2008; Crush & Frayne, 2010a). Therefore, maintaining such relationships are essential to continue urban food supply.

In the remainder of the thesis, I argue that the complex historically racial and spatial dynamics which are pronounced in South Africa continue to influence food access. Moreover, in urban environments these issues can potentially determine how food systems unfold and subsequently govern the ways in which food is obtained within these spaces. Following the presentation of the research findings, the thesis concludes by outlining how the case study advances the literature on AFS.

3. Methodology

For this research, the study site of Siyazenzela Food Garden project was chosen to explore AFS in the South African context and their contribution to food security.

3.1. Study Site

The Siyazenzela Food Garden Project is part of Siyazenzela Biotech and Agricultural Consultancy and is situated in Phiri, within the township of Soweto (Figure 1). The Siyazenzela Food Garden Project was initiated in 2010 by two male residents who continue to have sole ownership of both the project and the consultancy. The venture was introduced as an experiment to assess if there was any chance of lessening the dependence of purchasing fresh produce from hawkers and street vendors who sourced their goods from City Deep, which is a fresh produce wholesale market. The founders felt that produce coming from sources like City Deep were questionable in terms of their quality and might not be beneficial to the health of local consumers. As a result, Siyazenzela was expected to be an alternative enterprise that would provide locals with fresh, affordable, quality, environmentally-friendly and locally-grown crops on a regular basis. In addition to growing fresh goods, the project provides consulting services to local households and organisations by supplying resources and training on starting and maintain their own food gardens.

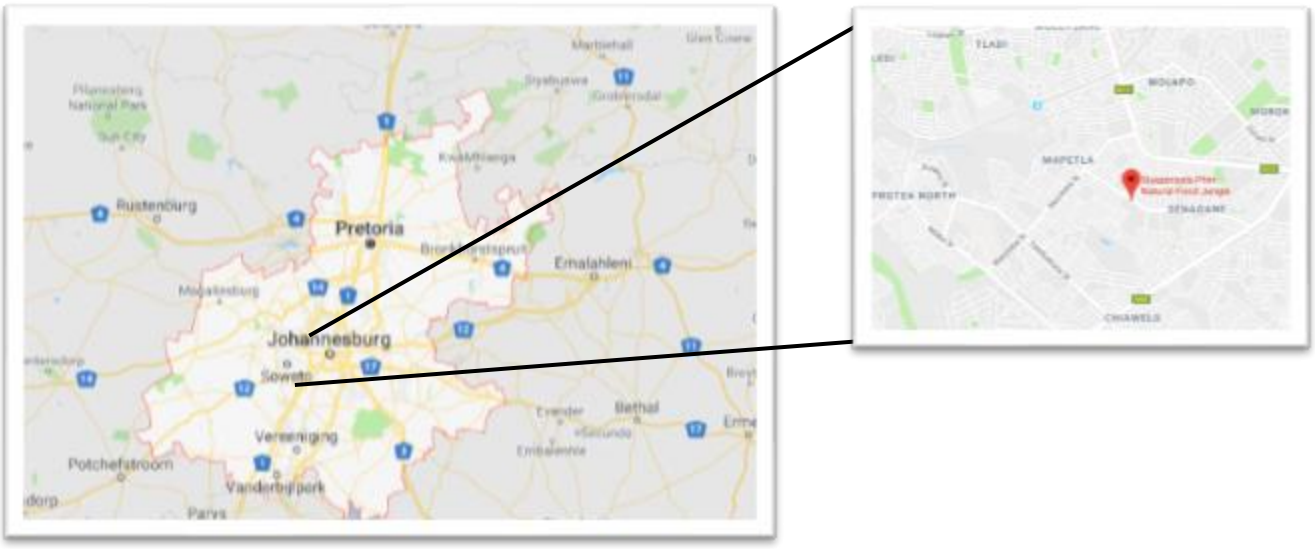

Figure 1: Location of Siyazenzela Food Garden in Phiri, Soweto- Johannesburg, South Africa and surrounding townships and residential areas (Source, Google Maps, 2019).

The project is operating within a ten-year lease agreement which was granted to them by the Department of Agriculture Fishery and Forestry [DAFF] and the Department of Education [DOE]. Now in the seventh year of their tenure, renewal of the lease agreement is said to be dependent on a review of their contribution and importance to the community in Phiri. The land upon which they operate is fenced within the same premises as the Phiri Special School, which provides Siyazenzela with a storage room for their tools and equipment.

The total size of the garden is 8000m^2 of which 4880m^2 is used for cultivation purposes. Small sections have been demarcated for the use of compost making, off-loading mulch, placing water tanks (2x 10,000 litres and 2x 5,000 litres), a drying house (12m^2), a metal container for security to live on site (occupied by the garden manager), and two makeshift nurseries (6m^2 and 8m^2) also referred to as stoves. Most of the spaces which are used for cultivation are watered through an irrigation system that is fed by the two 10,000litre water tanks which are filled from the project's own borehole.

During the time this research was conducted, the most common crops grown and purchased were spring onions, herbs such as parsley (flat and Italian varieties), rosemary, thyme and coriander, ground dried chilies, and morogo. Morogo are "green leafy vegetable from the *Amaranthaceae* family that can be harvested from wild growing or cultivated plants" (Medoua & Oldewage-Theron, 2014:736). The most common morogo varieties grown within the garden included spinach (green, yellow and purple varieties), green mustard, red mustard, chinese cabbage, black jack, choumolier and other indigenous/wild green leafy vegetables. Other crop species had not yet germinated or would be planted in the coming months to prepare for the spring and summer seasons. These crops included pumpkin, beans, tomatoes, carrots, strawberries, beetroot, spring onion, sweet peppers, chilies, figs, green bean, cabbage, lettuce, green and yellow peppers, grapes, granadillas, peaches, pecan nuts and citrus fruits. Herbs typically planted or expected to re-appear during this same period included lemon verbena, lavender, fennel, dill, basil, sweet basil, lemongrass and different varieties of aloe.

As a privately-owned company the project receives limited assistance from government institutions. The founders felt such a set-up was necessary to limit the amount of influence government departments would have on their daily operational activities. As a result, this has meant that the project has had to independently fund most of its endeavours and resources. However, as one of its major aims is to aid the wider community by providing access to fresh food, so some forms of external assistance has been made available. For example, DAFF has occasionally brought seedlings for the project, most often when a representative is conducting site visits to other local farming and gardening projects. In addition, a local environmental NGO Food and Trees for Africa has also assisted the project by equipping the garden

manager with permaculture training which is an alternative form of agriculture and is practiced today alongside other farming techniques.

3.2. Methods

Data were collected during the periods of the 3rd of July 2017- 22nd August 2017, using the methods of semi-structured interviews and participant observation. Semi-structured interviews were carried out whereby the "interviewer has some discretion about the order in which questions are asked, but the questions are standardized, and probes may be provided to ensure that the researcher covers the correct material. This kind of interview collects detailed information in a style that is somewhat conversational" (Harrell & Bradley, 2009: 27). The interviews were conducted with one of the founders of Siyazenzela (Respondent 6) and all five employees. The five employees included the project manager who had worked at the venture for seven years (Respondent 5), an older lady who had been employed for nine months (Respondent 4), an additional lady who had worked for the project over a year (Respondent 2), and two younger men who had been placed at the project for two and a half years (Respondent 1 and Respondent 3). The project manager did not feel comfortable with customers being interviewed but allowed for informal conversations to be had whilst waiting for their produce to be harvested. At the time there were no records kept of the crops planted, those harvested or of any sales which had taken place. The project manager was the only employee permitted to handle funds obtained from produce sales.

With the semi-structured interviews there were basic questions used to explore each of the objectives. Table 1 highlights some of the base questions used in the semi-structured interviews to explore each objective.

Objective 1	**Objective 2**	**Objective 3**

1. Based on each respondents' tenure at Siyazenzela, why do they think it came into existence?	1. What are the prices of the various produce?	1. What have been some of the internal challenges that have hindered the project's activities?
2. Can they identify the various activities the project partakes in on site; for instance, production, processing and marketing practices?	2. Where and who does the project sell to?	2. What are some of the external challenges that have hindered the project's activities?
3. Apart from these on-site activities, does the project undertake any other activities off site?	3. Aside from selling does the project donate any produce and, if so, to whom?	3. Have there been actions taken to overcome any of these challenges?
4. Does the project work with other people or groups (locally or externally) and, if so, to what extent?		4. How would they prefer some of these challenges to be handled?

Table 1: Base questions used in Siyazenzela semi-structured interviews.

Participant observation was also used to 1) Validate the findings from the semi-structured interviews, but also 2) Potentially bring to the surface other non-noted topics. Participant observation is a research method in which the researcher partakes in daily activities, ceremonies, exchanges and events of the subjects (Becker, 1958; Dewalt, Dewalt & Wayland, 1998; Cassell & Symon, 2004). Participant observation was conducted with the employees, customers and external groups or individuals who came to the site and interacted with the project members and their activities.

Interviews and observations were recorded and transcribed. Once data had been collected it was coded to identify key findings for the literature on AFS. Some specific codes used were production activities, relationships/interactions with the wider community, constraints, marketing strategies, and catering to local preferences and diets. This allowed for better analysis of the qualitative data and furthermore, it assisted in identifying developing themes without losing the links between ideas and their context (Basit, 2003; Dey, 2003; Bradley, Curry & Devers, 2007).

3.3. Positionality and Participatory Ethics

An important consideration which had to be kept in mind when conducting research is that of positionality. The argument regarding positionality has been that researchers need to be mindful as to how their position may complicate power relations in the field, and more importantly they should use their role to write *with* and not *about* participants as a way of evening out some of the unbalanced relations (Sultana, 2007). Consequently, the researcher felt it best to continuously participate in the everyday gardening activities during the research time. This was to demonstrate that both parties would be forming a mutually beneficial relationship to a degree. In addition, it assisted in overcoming some language barriers as the time was used to familiarise the researcher with certain words, phrases, techniques and practices that the participants might have not been able to easily translate into English.

Moreover, to ensure some level of trust was developed between the participants and researcher, consent forms were given prior to data being collected. This was to outline the type of information that was going to be collected and to highlight anonymity in this research. This was an attempt to ensure the participants felt comfortable to express themselves freely without having to alter their behaviour or responses, because they were reassured that their information would be handled

safely.

Prior to any research being undertaken ethical approval from the University of Cape Town's Faculty of Science Research Ethics Committee was sought. After all mandatory requirements had been met and protocol put in place for research, approval had granted under the code **FSREC 38** – 2017.

4. Results

The results chapter discusses three facets of how the Siyazenzela project aims to improve food security in the Phiri community: 1) Consumer preferences and Social Interactions (local diets, affordability and social capital), 2. Farming System (production inputs and activities), and 3. Marketing and Distribution (on-site and off-site trade),

4.1. Consumer Preferences and Social Interactions

Siyazenzela uses several activities and strategies intended to increase the consumption of fresh locally grown produce within the Phiri community. Many of these actions overlap or operate independently based on the specific beneficiaries.

4.1.1. Local diets

During the data collection period, fifteen customers were witnessed coming onto the site to purchase produce. The patrons were comprised of seven mature women (aged 35-50), two elderly ladies (aged 60-75), two elderly men (aged 60-75), two mature men (aged 35-50) and two children (aged 9-12). The most commonly sought-after crops were morogo. It was observed that at least ten out of the fifteen customers came to purchase these crops. Their popularity was further demonstrated by the fact that the project had designated the largest portion of the garden towards growing morogo. The importance of morogo for some of the more vulnerable community members was detailed by Respondent 4: "The elderly ladies and gentlemen make up most of our customers and they really love all [sic] the morogo. Also,

many of these elderly people complain that eating meat is causing them health problems and so they would rather eat morogo as part of their meals." Alongside morogo, Siyazenzela grows other produce that are considered household staples. According to Respondent 6, these include "cabbage, onions, tomatoes, potatoes and pumpkin. These foods are important for people from *elokishi* [the township] especially as they are foods we are accustomed to eating."

Unlike other surrounding food retailers, Siyazenzela exhibits great transparency with the community, by informing them how their favourite foods are grown and maintained before being purchased. Subsequently, Siyazenzela has argued that such factors have influenced locals to purchase their everyday staples from the project rather than other retailers where the quality of their produce is unknown. This sentiment was echoed by Respondent 2: "We have seen that customers prefer our produce because they know it is very fresh, so much so, it is pulled straight from the ground when they want to buy anything. I even hear some customers say that they had passed the Pick n Pay just to get food from us because of the quality and taste."

Siyazenzela has attempted to diversify local diets by planting new crop species and different varieties of regularly consumed produce. For instance, Respondent 2 states, "we also introduced a variety of spinach not only the green type but the purple and yellow kinds. Since they have been brought in and people have been told about their health benefits, they have started buying them on the regular." This same approach has also been carried out with other frequently-eaten vegetables, "like with onions we do both red and normal onions, with peppers we do a colourful collection including the yellow, green and red types" (Respondent 6). For the founder of the project the introduction of new crop varieties was done to educate the community about their existence and to make these foods readily available in the township. Furthermore, he wanted residents to be informed that many of these non-familiar

foods have essential nutrients and households should not be afraid to experiment with them by incorporating them into everyday meals. However, as the project sought to enlighten its customers on the new and different foods available at their site, their uptake by residents can at times be challenging. This is an issue which has been detailed by Respondent 5: "We also have a challenge from the community because when we try and introduce a new plant or a different variety, they find it difficult to accept them. Like we say to them try these herbs like coriander, but then they tell us we do not want to eat any flowers."

The capacity of Siyazenzela to provide locally favoured foods to residents on a continuous basis is limited due to factors such as seasonality and demand. Some of these complexities are demonstrated by Respondent 2 who stated: "Another thing I have noticed is that because our produce is loved by so many people and the demand is high, we can sometimes get customers coming to buy four bundles of morogo at once. The problem is that if people continue to buy such quantities it means that other customers will go without any or not as much as they would have liked". Such high demand was noticed through 5 of the 10 customers who had come to purchase morogo, being told to return in two weeks when new crops have grown and would be ready to be harvested. Furthermore, an additional 3 pedestrians walking along the fence of the project asked if there was any morogo (specifically green mustard and chinese cabbage) available and they were also informed to return at a different stage. Seasonal differences also impact crop availability as quantities were said to be at their highest during the warm and rainy periods of the year (September - March). During the colder seasons the project is unable to meet the high demands customers place on them and more especially with morogo crops. One of the suggestions put forward to overcome some of these challenges was noted by Respondent 4 who stated: "I think it would be great if we could find other spaces locally that can be converted into gardens like ours. This will lessen the pressure on us having to provide food for so many people."

4.1.2. Affordability

An additional factor which contributes towards customers purchasing food from the project is its pricing strategy. Siyazenzela is conscious of the socio-economic situation of the wider community in which it operates. For instance, within Ward 16 where the project is located, of its total 26,984 residents only 39.5% have some form of employment and from this group 79% operates within the informal sector (Wazimap, 2016). Furthermore, in this same ward monthly household income stands at R2450 (Wazimap, 2016). Such conditions have influenced the project to set prices slightly lower than surrounding formal and informal food retailers. Table 2 highlights the prices of some of the various crops grown and sold by Siyazenzela. For instance, 1kg of spinach costs R6.50, whilst surrounding hawkers and street vendors priced the same crop between R9-R10 and the Pick n Pay supermarket at R11.99. Other more commonly consumed vegetables are also cheaper at the project with prices per kilogram for green mustard at R8, onions (R8), spring onion (R12), baby carrots (R16), choumolier (R5.60) and red mustard (R10). The prices at Pick n Pay for some of the same crops per kilograms were priced at R18.99 for onions, carrots R9.99 and a spring onion bunch at R12.99. On average, the researcher calculated that the supermarket prices were 49.14% higher than those of Siyazenzela's products.

A point which has been repeatedly reiterated by the participants is the believe that the project sells quality produce at extremely affordable prices. This notion was reaffirmed by Respondent 6: "Our prices are always cheaper compared to other sellers in the community. Also since our quality of produce is arguably much better than that sold in supermarkets, street vendors and hawkers, people are getting a good deal." This same stance is further emphasised by Respondent 5 who noted: "Usually organic food would be associated with shops like Woolworths and people would think their prices are really high. So now we want to show them that we can sell the same good quality food but at prices that are affordable for

them."

One of the reasons attributed towards the project's lower prices is that unlike other surrounding retailers, Siyazenzela does not have to spend additional funds on processing and packaging off-site. The only crops which undergo any processing are chilies, onions, and herbs which are all washed and placed in the drying house to remove any moisture. The chilies are then ground on-site and placed in plastic jars. Similarly, once the herbs are dried they are weighed and bundled - ready to be sold. All other crops are harvested upon customer request, then weighed, and sold and placed in plastic carrier bags. If these additional activities had been undertaken elsewhere and not on-site, Siyazenzela would most likely have to increase its prices to accommodate these additional expenses.

Product	**Price**	**Quantity**
Baby carrots	R80	5Kg
Baby Spinach	R40	5Kg
Celery	R60	500g
Chives	R60	1Kg
Chocolate Mint	R65	1.5Kg
Fennel	R60	1Kg
French tarragon	R60	1Kg
Green Mustard	R50	8Kg
Kale/Choumolier	R45	8Kg
Lovage	R80	10Kg
Onions	R80	10Kg
Oregano	R80	1Kg
Parsley	R45	1Kg

Peppermint	R65	1.5Kg
Red Mustard	R50	5Kg
Rosemary	R70	300g
Sage	R80	1Kg
Spearmint	R65	1Kg
Spinach	R65	10Kg
Spring onion	R24	2Kg
Strawberries	R40	1Kg
Thyme	R70	300g

Table 2: Siyazenzela price list

4.1.3. Social Capital

4.1.3.1. Donations

Siyazenzela uses a few social strategies to increase the consumption of fresh produce in the Phiri community. For instance, the project is located on the same premises as the Phiri Special School. To support the school, Siyazenzela donates fresh produce to be used as part of the school's feeding scheme. This is most successful when there is a bumper harvest during warm, rainy seasons; however, Siyazenzela also contributes crops such as culinary herbs to the school during the cold winter season.

In other instances, fresh food is also given freely to customers in what is known as "bantsela" which is a gifting of produce. "Another thing we do is when we also have extra produce that has not been bought or slightly damaged we give them away as a bantsela [a bonus/gift] to customers. In this way we do not have to get rid of the produce and this action is an extra way to attract customers back" (Respondent 1).

As the project is located on one of the main roads (Mabalane Street) in Phiri where high foot traffic is common, there have been cases where pedestrians have noticed indigenous plants and requested if they could harvest for free. For instance, two elderly ladies were observed harvesting wild plants and referred to them as "morogo wa-sitsu" (traditional/indigenous morogo). The donation and harvesting of plants such as "morogo wa-sitsu" was explained by Respondent 3: "These plants just grow on their own and we get people who walk past the garden, and see them, and come to ask if they can pick them to go eat at home. We don't complain and allow them to harvest. This might change if we ever decide to grow them in the planting beds to be sold." Similar donation patterns were observed with an elderly lady who came to request herbs to be used for medicinal purposes.

Other produce that is given away to customers or any residents requesting them are fruits when they are ripe. Furthermore, to extend the consumption of fruit in the community Siyazenzela harvests some fruit tree cuttings and gives them to surrounding households to be planted in their yards. The motivation behind this action was outlined by Respondent 5: "We do this because in the township we always see the same trees growing and in many cases, they are just shade trees. To us this is pointless because it is better to have a tree that can feed people as well. That is why we give away our fruit tree cuttings as we want to see a variety of trees growing in Soweto that people can eat from, have shade and green our community."

4.1.3.2. Education

An additional action undertaken by the project to increase the presence of fresh produce in households is through the provision of training, knowledge and resources. Siyazenzela provides consultation services for a certain fee. The project offers training and resources from their own garden such as seeds, mulch, compost (when available) and seedlings (at R100 per tray or R1 individually) to be used for the establishment of gardens at households. It can be argued that Siyazenzela directly engaging with the community at their

homes is facilitating easier transfer of information and skills to beneficiaries, as the project members are able to tailor their expertise to the customer's specific environmental conditions. Such direct encounters could improve access to healthy and fresh produce because Siyazenzela is able to equip families with the capabilities to continue their own production at a household level.

Alongside this paying service the project also offers free assistance through advice and knowledge exchange with people who are interested in alternative food practices. This is reflected by Respondent 5 who explained: "We also try to educate and encourage customers to use herbs as part of their daily routine. Next to the price list we have placed a small information sheet about some of the popular herbs we have in the garden and their medicinal uses. We hope that as customers read this information they become interested, wanting to find out more and notice that these herbs are readily available in the garden." The existence of knowledge exchange was observed when a local gentleman came on-site with a book on herbs and left copies for the garden manager. At the same time the garden manager gave him advice on caring for his herbs at home. This type of exchange clearly demonstrates the generation of social capital within the Phiri community.

4.2. Farming System

The farming system employed at Siyazenzela uses various production methods aimed at producing better quality crops and ensuring long-term productivity.

4.2.1. Production Inputs

To overcome certain input costs, the project uses both on-site and local resources. One such resource is mulch which is used for retaining soil moisture and suffocating weeds naturally instead of having to use herbicides. Rather than purchasing mulch, the project uses grass cuttings sourced from local parks and roadsides which are maintained by the Johannesburg City Parks department. When City Parks would carry out such works the waste

would usually be collected for disposal at landfill or compost making sites. Siyazenzela's garden manager regularly scouts out various cutting sites in Soweto and once found requests from the managers at that site if the waste can be diverted and instead delivered to the project. The delivery is carried out at no cost, but the garden manager does give transporters a fresh produce basket/hamper to demonstrate his gratitude.

A similar approach is taken with regards to compost. As a necessary resource that is used on all the planting beds to add nutrients and promote earthworm activity in the soil, it is created on-site through waste (damaged, leftover or overgrown) crops; however, it is said to take at least six months to decompose and even longer if a catalyst is not added. When funds are available additional compost is sometimes purchased from the garden depo centre in Soweto. Yet, the slow decomposition process and/or a shortage of funds, led the project to find other alternatives. As explained by Respondent 5: "I go around the whole of Soweto looking for livestock owners and especially chicken farmers to get some of their manure. It is usually given for free, but we give them a bit of cash sometimes to say thank you or even a couple of bundles of Spinach as a sign of gratitude. We also have our own truck, so we can go and collect ourselves. In some cases, we have people deliver us free chicken manure and sometimes, I can go and deliver bags of vegetables just as a token of my appreciation." The animal manure collected locally is used as a substitute for the lack of compost.

An additional input which originates both on-site and locally are seeds. Seeds are harvested from certain plants and are also bought from commercial stores. The harvesting of seed is partially done to overcome the difficulty that certain plants that cannot be easily found or purchased in stores such as choumolier, black jack and chinese cabbage. An added reason noted for seed harvesting is that sometimes the project runs low on funds and this can make it difficult to purchase seeds during these periods. To overcome such challenges the project has resorted to accumulating its own seed bank to ensure its planting activities are not halted. One

of the major difficulties experienced through seed harvesting is that it can take a while before the plants eventually develop the seeds. Consequently, the project has had to purchase commercial seeds which are of hybrid and open-pollinated varieties [OPV] origins from the garden centre in Soweto. The garden manager was questioned about what the types of seeds purchased from the garden centre meant for the quality of the crops they grow especially if they state their produce is organic. He was adamant that despite where the seeds were obtained the important thing is that they use organic and permaculture farming practices, so that should be enough to ensure crops are suitable for consumption.

As the project is privately owned it must fund its own activities primarily through the funds obtained from selling its produce. Dependence on funds obtained from the garden has for the most part limited the project from investing in some essential inputs and resources. For instance, one of the greatest challenges noticed during the research period was the frost and the inability of the project to purchase protective covers for crops. An added issue noted by the participants is that of theft. Limited funds have meant the project is unable to purchase new fencing to protect their crops from thieves. Even though the garden manager lives on the site, when he is not present the locals find easy openings through the current fencing to steal produce.

4.2.2. Production Activities

Siyazenzela was formally introduced to alternative farming practices through a local NGO called Food and Trees for Africa. The NGO provided both training and some resources to be used in starting a permaculture food garden. The training covered 5 sections/modules which were: 1. All about permaculture, 2. All about growing trees and Bamboo, 3. Starting your own nursery, 4. Ideas for educators, and 5. Resources. These modules where intended to equip the project members at the time with expertise on establishing holistic and environmentally friendly agricultural systems, which not only result in the presence of good

quality food but safeguard the natural resource base so that long-term production may continue. One of the major teachings of the training that is still practiced is intercropping, which is the growing of two or more crops near one another. A reason behind such planting was that it enabled the project to maximize space through mixing differently shaped and sized plants together on a single bed. An additional reason for this planting method was noted by Respondent 5 who stated, "we mix certain plants together on a bed like we can mix parsley, spring onion and spinach together. Why do we add spring onion? It is because its smell can chase away certain pests and it is the same with rosemary." So, not only does intercropping maximise limited space in the garden, it also maintains soil health and helps to naturally eliminate pests as well.

Siyazenzela steers away from the use of artificial agro-chemicals such as pesticides on their crops because of the concerns that such chemicals may impact the health of customers when the crops are consumed. As a result, another way the project overcomes the issue of pests is by creating its own pest repellent sprays using specific herbs (comfrey, borage and dandelion) and plant based (fermented chilies) concoctions, all of which are sourced from the garden itself. These mixtures are said to have many benefits for instance, "with the borage mixture we have seen that it not only protects the plants from the pests but feeds them with some nutrients as well" (Respondent 6). In this way the project is said to inexpensively protect their crops, and safeguard both their surrounding environment and their customers.

Although some of these farming methods are said to have numerous benefits, they do fall short in providing a constant supply of produce to meet local food demands. This view was stressed by Respondent 5: "Another slight challenge is that the way we operate is through an organic and Permaculture methods and this means that with our sort of produce you have to wait awhile before it is ready. We don't use

chemicals and so people have to wait, that is why you have seen that we had to send people away because there was no morogo available."

Another hindrance to productivity includes the lack of knowledge and transparency in the supply chain prior to an inputs' arrival on site. During the research period a DAFF representative was witnessed bringing three bags filled with cabbage, choumolier and spinach seedlings. The garden manager was asked by the researcher if the seedlings were GM, hybrid, OPV or organic, and he was not sure. However, he felt certain that DAFF is aware that they implement organic farming principals, and steer away from chemical use and GM crops. The garden manager insisted that since the department has knowledge of how they operate, they should ensure resources that are brought to the project adhere to their fundamental principles. Yet, the author asserts that this knowledge gap could result in the production of crops that are not truly organic but may be the only option when the project experiences lack of funds to purchase suitable alternatives.

4.3. Marketing and Distribution

Siyazenzela markets its goods on-site and off-site through numerous platforms to bring it produce closer to not only the Phiri community but other residents in Soweto.

4.3.1. On-site trade

As noted earlier, Siyazenzela is located along one of the major transport routes (Mabalane Street) in Soweto which is used by pedestrians, private cars, the local public transport association (also referred to as taxis) and other forms of commuters. This makes it an easy point of access for the 8923 households within Ward 16 where the project is situated, and the 7178 households in Ward 15 which Mabalane Street runs through. On-site purchases were the most commonly witnessed retail activity taking place during the research. One of the reasons attributed to such patterns was the fact that produce was usually only harvested

when it was being bought and customers would have to come on-site so that harvesting would take place. An additional, reason for on-site purchases was highlighted by Respondent 4: "The project has been here for more than 7 years and people know where to find us. Plus, they love our food so much they are willing to come to us to get what they want."

During the rainy and warmer periods of the year when production is said to be at its highest, selling also occurs at the corner end of the Phiri Special School through vegetable stands. The school and Siyazenzela are located opposite Phiri community hall where monthly social grants are paid out to recipients such as the elderly, disabled, war veterans and mothers. Social grants are government led non-contributory cash transfer programmes that act as a safety net to assist the most poor and vulnerable members of society (Neves *et al.*, 2009). The erection of the stand during these pay days and especially when crop variety is at its greatest are used as opportunities to attract customers into purchasing the produce and bringing awareness to locals about Siyazenzela activities and what foods are available locally.

4.3.2. Off-site trade

As Siyazenzela is in and amongst households within Phiri and near major transport routes, the project has found ways to monopolize on the accessibility such an environment provides. One such practice has been the garden manager using the weekends, when foot traffic is usually at its highest, as an occasion to promote Siyazenzela's produce. This is done through walking around Phiri with fresh food in carrier bags and attracting locals into purchasing their goods. As the garden manager is the only employee who carries out this specific task and primarily during the weekends, there are a limited number of people and areas in Phiri he can reach through this method.

Although the project primarily focuses on on-site sales and sales to Phiri locals, they do extend their produce to other towns in Soweto. For instance, some of the restaurants and

street food vendors in Vilakazi Street (Orlando, East Soweto), Zola (Central Soweto) and Chiawelo (South Soweto) place orders for fresh produce and herbs, and, if available, they are delivered by the project manager. These relationships have been formed over years and it is believed that such traders purchase their products from Siyazenzela due to their quality and in some cases their rarity. This is expressed by Respondent 5: "There are also a couple of ladies who sell atcher [spicy pickled mango eaten as a relish] by Chiawelo Clinic and they purchase our processed chilies to add to their atcher. I charge them R35 and I explain to them that the produce is organic, harvested, dried, cleaned and then grinded with a blender. I hope by explaining the process they can understand why we charge them this much."

Farmers markets have also started emerging in Soweto especially in spaces where people would usually commune for local events. As a result, Siyazenzela have sought to use such locations to extend the presence of their produce in and around Soweto. One such market is held at the Jabulani theatre: "We go to a farmer's market at Jabulani Theatre [central Soweto], where we use the space to sell our produce, market ourselves and buy goods from other farmers" (Respondent 1).

Although Siyazenzela prides itself on the quality of crops it produces and how its standards differ from those of surrounding retailers, the project does engage with outside vendors. For instance, "we also sell to street vendors like there is a lady who sits by the Pick n Pay along our road, who used to buy green pepper from us and I would bring it to her whenever it was available" (Respondent 5). However, the project does not supply the local supermarket (Pick n Pay) or the street hawkers with produce.

5. Discussion

This section will explore the findings from the study by engaging with relevant academic literature introduced in Chapter 2.

5.1. Creating an Accessible Food Supply

5.1.1 Marketing and Distributing Close to Potential Customers

Although Siyazenzela is a lawfully registered company and operates through legal parameters, it additionally implements informal activities which are not necessarily regulated but seek to supply households with its goods. Such characteristics echo authors such as Hughes (2005) and Abrahams (2006) who argue that AFS in South Africa can exist in both formal and informal spaces within food systems. One of the important features witnessed through Siyazenzela's marketing and distribution strategy is that unlike formal food suppliers, the mobility the project possesses enables them to engage directly with customers. This can be witnessed through the delivery of fresh produce to restaurants and street food vendors in Soweto, and through the manger taking on the role as a mobile market over weekends. As mentioned in the literature review, AFS emphasises the importance of increasing the proximity between customers and producers, therein creating Short Food Supply Chains [SFSC], and this is a characteristic which can be witnessed with Siyazenzela. It has been suggested through the scholarship that by establishing such there is a greater chance of increasing household consumption of fresh food due to its easier access and subsequently improving the food environment. Studies by Thom and Conradie (2012) and Thom and Conradie (2013) demonstrate how other initiatives have sought to bring produce closer to residents. In their studies the authors argue that urban environments experience challenges such as competition for land and other resources which can limit production capabilities (Thom & Conradie, 2012; Thom & Conradie, 2013). Thus, other forms of food supply have been established through vegetable box delivery schemes in Cape Town. Urban farmers from "Harvest of Hope, a social enterprise scheme; Wild Organic Foods, a for profit scheme; and Ethical Co-op, a co-operative scheme" (Thom & Conradie, 2012: 3), grow organic produce and deliver them to central pick up locations which are reachable for their customers (Thom

& Conradie, 2013). Such movement exhibited in the Siyazenzela case, Thom & Conradie (2012) and Thom and Conradie (2013) studies highlight that some AFS actions provide convenience to urban households by bringing fresh produce closer to them and this could potentially increase the consumption nutritious produce.

An additional method used by Siyazenzela to overcome the distance customers would have to travel to obtain perishable foods, exists through the erection of fresh produce stands on social grant pay days. By placing stands near the Phiri Hall where grants are paid out, the project has aptly positioned itself near potential customers who benefit from this convenient location and enable them to purchase directly from producers. As mentioned in the literature review, AFS activities such as the presence of farmers markets and stands in low-income communities can improve local diets. This is a stance which has also been taken by Siyazenzela, as the project not only seeks to provide Phiri households with fresh produce but moreover improve diets by supplying diverse crop varieties at affordable rates. Evidence which demonstrates how the introduction of fresh produce stands in low-income communities can improve local diets was presented by Evans *et al.* (2012). In their study, Evans *et al.* (2012) placed farm stands at popular sites within residential areas in East Austin, United States where locals commute both on foot and automobile. Stands were placed in their locations over a period of 12 weeks but were only operational for two-three hours one day of the week (Evans *et al.*, 2012). Behavioural changes were observed on 61 individuals who lived within a 5-mile radius from each stand (Evans *et al.*, 2012). The study concluded that by bringing "a variety of locally grown, culturally appropriate" produce closer to these areas had resulted in an increased consumption of both fruits and vegetables (Evans *et al.*, 2012). To ensure Siyazenzela can continue to supply its produce closer to residents' further assistance is required to maintain these actions and even extend them to other areas in Phiri. This can be done through municipalities improving or building adequate marketing

structures, ensure hygiene facilities are available (i.e. clean water) to limit unhygienic conditions at marketing spaces and improve access to market information (Pichop & Weinberger, 2009; Mthombeni, 2013).

5.1.2 Increasing Access through Pricing

An unexpected finding displayed by Siyazenzela is the project's pricing strategy. In much of the literature, the presented argument is that food provision through informal activities are said to be higher priced than goods purchased in supermarkets. For instance, a study by Emongor (2008) cited in Crush, Frayne and Pendleton (2012) found that in Botswana and Zambia everyday household staples such as bread, milk, rice, and fresh vegetables and fruits were inexpensive at supermarkets in comparison to informal retailers/grocery stores. The affordability of food is said to be an important factor for improving household food access, as point which has been emphasised in much of the literature in Chapter 2. With an average household income of R2450 per month, the residents in Phiri would be considered a low-income community. To maintain a healthy diet, a four-member household in Phiri would need to spend R38.20 per day or R1146 monthly – nearly 50% of their monthly income (R2450) for such a diet. Therefore, to accommodate community needs, Siyazenzela has set its prices lower than the local supermarket (Pick n Pay) to ensure their produce is obtainable and that they do not put households at risk by diminishing their already limited monthly income. It can be argued that just as the AFS had developed under the apartheid government to assist many underserved communities in urban areas, Siyazenzela continues to do the same even after the regime has ended. The project's pricing is indicative of the fact that they are conscious "that low-income households are more sensitive to prices than high-income households" (Ruel, Minot & Smith, 2005: 9), and therefore Siyazenzela attempts to ensure their food is accessible through affordable pricing.

5.1.3 Supplying Informal or Formal Retailers

A topic which has received little attention within the AFS literature are the networks between informal vendors. Siyazenzela provides other retailors within Phiri and other parts of Soweto with fresh produce to be used in restaurants, street food or re-sale through street vendors. Through such arrangements they can extend their geographical range as their goods are consumed by people in other parts of Soweto. However, these actions are limited by the availability of produce which is said to be at its highest during the warm and rainy periods of the year and ultimately this affects supply to other vendors. The project however does not engage with the local supermarket and this may be due to its inability, like many urban and small-scale farmers, to supply regular volumes required by large scale formal retailers (Louw *et al*., 2007; Bbun & Thornton, 2012). This could be a future opportunity for Siyazenzela to further extend the reach of their produce and potentially increase their income, as there are successful cases where AFS activities have been integrated into supermarket supply systems.

For instance, a study by Chege, Andersson and Qaim (2014) explored how vegetable supply to supermarkets by smallholder farmers can improve their household income and nutritional intake. The study was conducted in the Kiambu District, a Central Province in Kenya and investigated 384 farm households. Of this total 85 households produced vegetables for supermarkets (namely Nakumatta and Uchumi) and the remaining 299 farmers undertook the same activities but sold through traditional channels only. The average size of the household farms was two acres where they grew exotic crops, everyday staple crops and (for some) small-livestock farming. The farmers who engaged with the supermarkets usually had verbal agreements between both parties or with specialised agents on vegetable quantities, quality and form of supply. Those who operated through traditional channels had no agreement with their buyers and often sold to informal traders without re-assurance of repeated purchases. Due to such set ups it has been estimated that smallholder farmers who

engage with supermarkets have the potential to boost their household annual income by 300,000Ksh, or an increase of 60% per year. Furthermore, on average these households had a 20% increase in the area used to grow vegetables, and they also experienced a 15% increase in calorie intake and essential nutrients such as vitamin A, iron and zinc.

5.1.4. Supplying Food Fortification Programmes

An additional topic which has received limited coverage from a South African context, is the potential contribution of AFS a form of food safety nets. Outside of supplying households, informal traders and restaurants, Siyazenzela also provides fresh produce to the adjacent school (Phiri Special School) for their feeding scheme referred to as the National Schools Nutrition Programme [NSNP]. Siyazenzela typically supplies the school with free produce during the warm and rainy periods of the year when they experience a bumper harvest. Realistically, even when a bumper harvest does occur it would not provide enough quantities to supplement the school's feeding scheme for prolonged periods and simultaneously ensure there are enough crops available for retail purposes. For those who handle and prepare the food within the NSNP a major concern has been that in some instances the delivery of produce does not occur at all and in some cases when the produce does arrive it has started to rot (Mtapuri, Kekana & Thabethe, 2010). However, the potential of obtaining some of the NSNP produce from Siyazenzela could mean the school and learners know where the fresh food they consume originates, and that somewhat better quality and locally preferred produce is incorporated into their meals.

An example of a similar school's nutrition programme is the Brazilian School Feeding Program (PNAE) (Sidaner, Balaban & Burlandy, 2013). The programme was initiated in 1954 and has progressively developed into a multisectoral strategy for improving food and nutrition security in all public schools. To increase access to adequate, healthy, organic and locally preferred fresh food, PNAE promotes the establishment of school food gardens and

small family farms as locations where produce can be attained for the programme (Sidaner, Balaban & Burlandy, 2013). The National Fund for Development of Education (FNDE) which is the official government body placed in charge of implementing PNAE has since 2009 allocated 30% of its financial resources towards the procurement of produce from family farms and rural family businesses (Sidaner, Balaban & Burlandy, 2013). This approach not only ensures farming enterprises are connected to stable markets, but it also increases presence of local and fresh fruits and vegetables in school menus (Sidaner, Balaban & Burlandy, 2013). Perhaps if Siyazenzela was to attempt to continuously supply Phiri Special School with fresh produce, the NSNP might have to take a similar stance as PNAE of allocating some of its funds towards specifically procuring perishable foods from local farms. Through such actions the project could generate some much needed and a consistent source of income which can be used towards overcoming production challenges and subsequently secure supply to the school.

5.1.5. Interactions with Global Food Supply Systems

The complete reliance on AFS such as Siyazenzela to constantly supply households with affordable, quality and locally grown produce is not feasible now, as the project is not able to maintain constant levels of productivity throughout the year. Many countries in the Sub-Saharan region rely on imported foods to supplement the shortages they experience with major staple crops and if such trade were halted it could hinder their ability to be food secure (Ballingall & Winchester, 2010). Furthermore, without global food trade many these countries would not be able to meet their everyday nutrient requirements (Wood *et al.*, 2018). However, it has been suggested that this form of food supply is sometimes only accessible to individuals or households with the financial capabilities to purchase these nutrient rich imported foods (Wood *et al.*, 2018). Consequently, AFS such as Siyazenzela are sometimes able to cater to those households who may not have such disposable income and require

alternative sources of food supply. This reaffirms the literature stating AFS and conventional food systems are interlinked and are both essential in overcoming food security challenges.

5.2. Sustainable Production

5.2.1. Knowledge Transfer

Siyazenzela has noted that many residents prefer to purchase their produce because they are very transparent about the farming practices they implement, and this makes them a favoured source of supply. Some of the literature on AFS namely Sustainable Diets stress the importance of educating consumers that there is an interdependent relationship between themselves and food production environments. The scholarship as highlighted in Chapter 2, argues that consumer food choices influence how landscapes are managed to meet demand, and in return this can impact the quality of food they consume. Siyazenzela has sought to overcome negative food choices and encourage the purchase of their food by educating locals about how the farming techniques they use, and the introduction of new plant varieties as not only nutritionally beneficial for them, but also environmentally advantageous. These actions are important especially as one of the key aspects for food security to exist is that safe and nutritious foods should be easily accessible to households.

An example of similar education strategies used to improve household production and access to nutritious foods has been exemplified through Ndunakazi Village Project, which is located 60km northwest of Durban, KwaZulu-Natal, South Africa (Faber, Witten & Drimie, 2011). The community-based agricultural intervention was established through a partnership between nutritionists from the Medical Research Council and the Agricultural Research Council (Faber, Witten & Drimie, 2011). The researchers highlighted that many of the children (primarily from the ages 2-5 years) consumed cereal-based diets made up mostly of maize meal, rice and bread which is an incomplete diet (Faber, Witten & Drimie, 2011). This carbohydrate-based diet led to many of the children to suffer from vitamin A deficiency.

To address this problem, the project established demonstration gardens around the village which were used as training sites (Faber, Witten & Drimie, 2011). This was done so that mothers would be equipped with the skills needed to not only create their own food gardens, but to ensure the increased consumption of vitamin A-rich foods (Faber, Witten & Drimie, 2011). Training and education were provided to both mothers and their children. This training covered soil improvement strategies (i.e. crop rotation, staggered planting and natural pest management), as well as how to plant crops high in Vitamin A and best prepare them for optimal nutrient retention (Faber, Witten & Drimie, 2011). Once mothers had established their own gardens, they were also provided with additional training on monthly monitoring of household production and consumption of the various vitamin A produce (Faber, Witten & Drimie, 2011). Significant positive results were noticed just 20 months from the project's inception (Faber, Witten & Drimie, 2011). Overall, mothers were better educated about the symptoms associated with vitamin A deficiency, participants were now eating a more nutritious and diverse diet, and vitamin A deficiency decreased from 58% to 34% (from the baseline level) (Faber, Witten & Drimie, 2011). Siyazenzela and the Faber, Witten & Drimie (2011) case are consistent with some of the existing knowledge detailed in the literature review, which note that AFS foster social embeddedness through their actions. This is achieved through reducing the distorted distanced between producers and consumer, so that people can form closer connections with their food, and therefore demand a necessary level of transparency and accountability about the quality of food they consume.

5.2.2. Resource Composition and Production Output

Much of the AFS literature encourages the use of local resources in their production systems, which, if done in a sustainable manner, enables some level of self-sufficiency and long-term production. Many of the production techniques used at the Siyazenzela project fall within those carried out within AFS, specifically, mulching through the recycling of grass

cuttings, the creation of plant-based pest repellent, seed recycling, plant intercropping and compost making. However, some authors have suggested that not all AFS actions lead to better quality crops. Rather, there needs to be an improved understanding as to how specific conditions within locations can alter the state of plants grown.

Furthermore, there has been a lack of questioning around the quality of these local inputs. For instance, a study by Manungufala, Chimuka, and Maswanganyi (2008) highlighted some of the potential complexities which can occur from using local resources and especially those obtained in urban environments. Their research investigated the quality of compost created by a community project and sold to vegetables growers in the city of Thohoyandou, Limpopo, South Africa. Part of the research indicated that ingredients for the compost were sourced from the local community's waste and from the town centre (which is 5km from the project). For example, compost inputs included "cabbage leaves from chain retailers within the town (Shoprite and Spar), green grass cut not far from the site and sawdust from the industrial area" (Manungufala, Chimuka & Maswanganyi, 2008: 1492). The study went further to explore how these different inputs increased the presence of certain unwanted elements in the compost. It concluded that the addition of sawdust and cabbage leaves increased the presence of heavy metals such as iron, manganese, chromium and nickel in the compost, which could eventually be absorbed by crops (Manungufala, Chimuka & Maswanganyi, 2008).

Arguably through Siyazenzela incorporating local resources into their production systems they could obtain some level of self-sufficiency for long-term production. However, there needs to be better knowledge of how various inputs like the animal manure or the mulch used at the project can potentially alter the quality of their crops. An added issue which also requires further exploration through the literature is how the location of AFS impact the crops grown. Some authors noted in the literature review, have suggested that AFS activities such

as urban agriculture can be exposed to exhaust fumes from vehicles, wastewater or untreated sewage. The fact that Siyazenzela is located along a major transport route and amongst households could mean that they may experience similar contamination, and these unwanted toxins or heavy metals might be transferred to consumers and negatively impact their health. These factors need to be accounted for and more especially as food security requires food to be safe and if it is contaminated by heavy metals or other toxins it does not meet the necessary standards.

An important subject which was further highlighted through this research and has received limited attention through the literature is the continued difficulty of some AFS producing enough food for everyday consumption. Siyazenzela incorporates various AFS elements into their production systems but one major element of ECOAR it does not implement is the use of artificial chemicals to intensify production. Instead, the project uses organic production methods which are said to have contributed towards lengthy growth periods and lower yields, especially during the colder periods of the year. This has meant Siyazenzela is currently unable to provide enough fresh produce throughout all seasons. However, authors such as Murphy *et al.* (2007) have noted that in some cases the low yields experienced in organic farming systems could be due to farmers handicapping themselves by using cultivars which are more suited for high-input and chemical intensive agricultural systems. Perhaps if Siyazenzela is to increase its productivity there needs to be more research conducted by either academics or agricultural institutes on how certain crops in organic systems respond to various faming variables. For instance, it is unclear if there is a greater chance of yields improving through irrigating crops or allowing them to be rainfed (Pretty & Hine, 2001). Without such understanding it may become difficult for the project or other similar AFS to not only provide food for the local community throughout the year but also in the future.

5.2.3. The Role of External Agencies

An unanticipated result presented by Siyazenzela, which has received limited coverage through the AFS literature is the role of external support. The South African government has demonstrated through numerous policies and enterprises their support for agricultural activities. Much of this support is intended not only at improving local food security but also increasing supply through black-owned agri-businesses (May & Govender, 1998; Van der Merwe, 2003; Louw *et al.*, 2008; Thornton, 2008; Webb, 2011). One such form of assistance has been witnessed through government agriculture extension workers. Although extension workers are put in place to facilitate transfer of knowledge, equip farmers with skills and provide the necessary resources to ensure agricultural systems are productive, their involvement can at times put AFS in risk. Much of the training and resources from extension workers focus on the use of artificial agrochemicals such as pesticide, fertilisers and herbicides, and new seed varieties which have been genetically modified (Salami, Kamara & Brixiova, 2010). Although Siyazenzela steers away from the complete use of agrochemicals they have continuously taken seedlings provided by DAFF, and it is unclear if these resources are of GM, hybrid or OPV origins. The use of such seedlings brings about their own challenges which may not have been accounted for by Siyazenzela. For instance, although many hybrid seeds have been developed to be drought resistant and high yielding, some of these varieties are unable to reproduce seeds and require farmers to purchase them on a yearly basis (Nyoro, Kirimi & Jayne, 2004; Alemu *et al.*, 2008; Stringer *et al.*, 2009). In other cases, government led subsidy initiatives can result in an increased presence of free OPV seeds and consequently this has discouraged farmers from growing locally adapted and traditional plant species (Hamukwala *et al.*, 2010). Siyazenzela's lack of knowledge concerning the origins of the seedlings provided through DAFF could potentially put their long-term productivity in danger. As it could be argued that these seedlings contribute

towards diminishing the surrounding biodiversity if they replace local and traditional plant species which fulfil specific and necessary ecological functions. These factors bring to the forefront the need to question the role of government or other external agencies involvement in AFS activities. As in the case of Siyazenzela it is evident that their assistance may be causing some unforeseen detrimental damage and could hinder households abilities to access safe and nutritious produce currently and in the future, which are both essential measures for food security to exist.

Considering the assistance provided through the government's agricultural department, Siyazenzela has taken an interesting stance of intentionally steering away from depending on it. The chief reason for such a relationship from the project's perspective has been the government's inability to fulfil the promises it makes to initiatives like theirs. This is due to the fact numerous that local government departments in South Africa have limited resources to help many of its constituents (Binns & Nel, 1999; Olawale & Garwe, 2010). As Siyazenzela is registered and functions as a private company this has meant that it must take on the major task of financing itself. This position, for the most part, can put the project in financially strenuous situations and can further impede their activities. One of the greatest challenges yet has been purchasing essential resources (i.e. ready to use compost, strong fencing to limit thievery and netting/shade clothes to protect crops) that can sustain or increase production levels. In such cases, it has been suggested that although consistent intervention may be difficult for the government perhaps some form of help should be given during low production season because, if inputs can be sustained, there is the potential of maintaining production levels (Kydd *et al.*, 2004).

A successful case of government intervention was demonstrated through a study of the Malawi Agriculture Input Subsidy Programme (MAISP) conducted by Dorward and Chirwa (2011). In Malawi, maize is essential not only as a staple crop but also for

maintaining many people's livelihoods (Dorward & Chirwa, 2011). However, several factors such as limited credit, insufficient organic or inorganic fertiliser, underdeveloped infrastructure, unpredictable climate, high levels of poverty, and constantly changing policies contribute to low levels of productivity and consequently puts many households in food insecure conditions (Dorward & Chirwa, 2011). As a result, MAISP was initiated in 2005 and funded predominantly by the Malawian government (Dorward & Chirwa, 2011). "The core of the 2005/06 and subsequent programmes have been their use of vouchers (or coupons) to target approximately 50 percent of farmers in the country to receive fertilisers for maize production, with further vouchers for tobacco fertilisers and for improved maize seeds" (Dorward & Chirwa, 2011: 234). The outcome of this intervention was that both household and commercial maize and other crop production had increased, and there was an improvement in household food availability (Dorward & Chirwa, 2011). However, one of the major threats to such a programme is the fluctuating price of international fertiliser. When the government is unable to afford the usual quantities, this results in the reduction of usage and could in future put household food security at risk (Dorward & Chirwa, 2011).

Considering such concerns, other authors such as Denning *et al.* (2009) and Dorward (2009), have argued that if government led subsidy programmes are to continue they should be created and implemented by using local knowledge and expertise. In that way programmes can be tailored for a specific group and their intended outcomes. Such a stance offered by Denning *et al* (2009) and Dorward (2009), on government intervention falls in line with the AFS agenda which champions a similar approach and if applied to Siyazenzela may have positive long-term results for their production system. Still, it is also important to caution that if such a relationship was to be formed the level of dependency on the form of assistance provided should not be overwhelming, as it could in future limit agricultural enterprises from being independent and sustainable in the long run (Chinsinga, 2011).

An additional issue that is linked to the role of external assistance is the issue of land and more importantly, how it contributes to the access of food for the local community. The land which Siyazenzela operates on is owned by the government and they are only permitted to carry out their activities due to a lease agreement signed between themselves, the DOE and DAFF. It has been highlighted in the literature review that the nature of tenure is important to consider because it can influence the way agriculture enterprises decide to invest in the land and whether to use its resources sustainably. Currently, Siyazenzela is in year 7 of a 10-year lease agreement with the government. Perhaps being conscious that they have secured their location for such a prolonged period has in turn influenced the sorts of production methods they use. The renewal of the lease agreement between Siyazenzela, and DOE and DAFF is said to be dependent on evaluating the project's continued impact on the wider community.

As highlighted in the Chapter 2, some AFS initiatives which operate on government owned land may be replaced with projects or endeavours that are thought to provide better benefits for the surrounding community, such as job opportunities. Furthermore, lack of permanent tenure security can make it problematic for agricultural enterprises to obtain investments like credit or loans from financial institutes, or even self-funding from the project owners themselves. As there is no certainty the initiatives will be operating long enough to repay the funds obtained or witness a return from their own investments (Atwood, 1990; Clover, 2003). Siyazenzela finds itself in a predicament as the land it occupies enables the project to easily engage with locals and improve access to fresh produce. Whilst on the other hand occupying this site has also meant they have limited options as to where they can obtain financial assistance from. Having access to such resources would be beneficial as Siyazenzela could use it to invest in necessary inputs or expand the projects activities, and possibly improve production output so that enough food is available throughout all seasons.

5.3. Providing Socially and Culturally Appropriate Food

5.3.1 Improving Nutrition Through the Provision of Socially and Culturally Acceptable Foods

An important aspect of food security which has been noted in the scholarship is that preferred foods should be easily accessible to households. Siyazenzela caters to such preferences by designating the largest portion of their cultivation space towards growing morogo which is said to be the most popularly consumed crops by the Phiri residents. The project grows a variety of morogo which includes spinach (yellow, green and purple varieties), black jack, choumolier, green mustard and red mustard. This variety means they are somewhat able to cater to a lot of the residents' different preferences and much of which is attributed to their cultural backgrounds.

A study by Vorster *et al.* (2005) demonstrates how preferences of morogo can differ amongst South Africa's diverse ethnic groups. The research investigated households in seven villages across three of the largest provinces in South Africa (Kwa-Zulu Natal, Limpopo and Eastern Cape). Many of the households obtained leafy vegetables and indigenous green leafed crops from their own vegetable gardens and local small-scale farmers. There were some overlaps with regards to preferences however gender and age were said to contribute towards consumption patterns. The authors noted that, "the Zulu, Shangaan, Swazi, Tsonga, Pedi and Ndebele groups tended to eat the leafy vegetables as a relish for the stiff porridge, and though not always preferred by men, was eaten by all. The Xhosa groups see leafy vegetables as 'woman's food', and prefer to eat meat" (Vorster *et al.*, 2005: 6). In Limpopo Balsam-pear (*Mimordica balsamina*) is favoured by many especially as its leaves are used as a spice (Vorster *et al.*, 2005). In the same region many men enjoy the bitter taste of Blackjack (*Bidens pilosa L.*) and it is used in plant-based dishes; however, the men also prefer Spider plant (*Cleome gynandra*) over *Amaranth* even though it grows in the region (Vorster *et al*, 2005). Furthermore, the Zulus in the Kwa-Zulu Natal region enjoy using *Amaranth* usually

on its own or incorporated into other leafy vegetable combinations (Vorster *et al.*, 2005). The Vorster *et al.* (2005) study highlights some of the varying characteristics rooted in the cultural consumption of indigenous crops. This a very important aspect which is very much embedded in Siyazenzela's production system and is evident through the different varieties of morogo they grow on their site. The project is clearly aware that if many of these culturally preferred foods are made available they could potentially increase household consumption of such perishable goods.

Furthermore, it has been argued in the literature review that AFS are important especially in urban environments because they are some of the few systems able to supply households with these culturally acceptable foods, which may not be easily available in formal retail spaces such as supermarkets. Consequently, Siyazenzela fulfills an essential role through the provision of these foods especially at affordable prices and this has enhanced their popularity amongst locals in Phiri. Other authors have argued, many of these wild and indigenous leafy plants contain essential micronutrients and should be cultivated in greater numbers to improve health standards especially in Sub-Saharan Africa. Bearing in mind the importance of culturally preferred food in food security one can assume that their increased presence can potentially contribute towards households overcoming food insecurity.

The fact Siyazenzela provides locals with culturally acceptable and nourishing foods is important however, the project is unable to supply locals with these crops consistently throughout the year. This could arguably mean that residents must find other alternative foods or suppliers to meet their demands. However, it is additionally important to caution that even if produce was constantly available this would not naturally result in increased consumption patterns; more especially, as other factors such as availability and convenience are said to influence dietary choices (Herforth & Ahmed, 2015).

The AFS literature review in Chapter 2 has highlighted that convenient foods are often the most consumed foods within poor households over healthy options. A case study demonstrating how these factors influence the types of food consumed was highlighted by Temple and Steyn (2011). The research compared the costs of a healthy and nutritious diet alongside an energy dense diet within South African communities. Their findings concluded that high energy density diets (i.e. more sugar and preservative based- jams, cookies and sweets) are very common in low-income communities due to their affordability and the fact that such foods are easily available in many of these residential spaces (Temple & Steyn, 2011). If low-income groups opted for a healthier diet (i.e. fruit, vegetables and protein sources such as beans) which have a lower energy density but superior nutrition, it would cost them 69% more to purchase such goods (Temple & Steyn, 2010). In addition, further ramifications for larger households within low-income communities pursuing a healthy diet would mean having to spend at least a third of their household income to maintain it (Temple & Steyn, 2011). Siyazenzela is one of the only major and visible agricultural enterprises on Mabalane Street, and the only other surrounding retailers where fresh produce can be purchased are the street vendors and the supermarket. However, the most dominant general retailers are spaza shops which sell many of these high energy dense foods and arguably it could be suggested that their presence may enable locals to easily acquire these foods over culturally acceptable and fresh produce provided by the project. Consequently, their presence could be said to further contribute towards issues of overnutrition as noted in the scholarship within the literature review, and put households in food insecure conditions.

6. Conclusion

The existence of AFS in low-income urban areas is very important because they can mitigate the food shortages experienced by households. This is primarily achieved by providing alternate sources which cater to their needs and requirements. Within South

Africa's low-income urban communities, access to food has been influenced by the after effects of the historical racial, structural, spatial and the socio-economic conditions enforced through the apartheid regime. Consequently, AFS exist as food supply systems that attempt to overcome some of these continued historical challenges.

The Siyazenzela Food Garden Projects exhibits typical characteristics of AFS found in South Africa, as the company exists in both formal and informal spheres within food systems. For the most part this is witnessed through the project operating legally but also incorporating informal methods to increase access to food for Phiri households and other Soweto residents. Through its endeavours Siyazenzela is recognised as fulfilling an essential role in the community by supplying locals with accessible, affordable, fresh and diverse foods. Furthermore, the fact the project primarily concentrates its production system on the cultivation of culturally acceptable foods and staples such as morogo, which are said to contain essential micronutrients makes it an invaluable enterprise.

Nonetheless, one of the major findings from this study is the need to question some of the assumptions supporters of AFS make by advocating for their uptake and practice. It is supposed that implementing these systems would automatically result in sustainable practices and outcomes, however the study site of Siyazenzela highlights that such notions are not necessarily true. Instead, there needs to be a whole chain approach (Ilbery & Maye, 2005; Maye & Kirwan, 2010) which will enable a closer critique of where, for instance inputs, are sourced and the quality of their composition. If such an understanding is developed there is a greater chance of highlighting certain areas within AFS that fall short in ensuring long-term access to safe, nutritious, healthy and culturally preferred food for household consumption.

One of the primary lacks experienced in some AFS and emphasised through the Siyazenzela study site is their inability to produce a constant supply of food throughout the year. This has meant that many of the project's more vulnerable customers must seek

alternative suppliers such as the local supermarket, street vendors, hawkers or spaza shops who may not necessarily sell the same quality, variety and affordably-priced goods as the project but are the only options available. Consequently, this study brings to the forefront the need to find ways of overcoming production shortages and ensure food is continuously available through any period. It also demonstrates the need to further comprehend how the interactions of AFS such as Siyazenzela operate alongside other retailers both formal and informal in influencing household consumption patterns. As on its own the initiative is unable to function at the same capacity as conventional food systems and support household's food security.

It is hoped that through this research some of the complexities that occur in South African AFS have been brought to the surface and more importantly highlight issues which may not have been accounted for in other studies. It is anticipated that more research can be conducted on similar projects or enterprises to further illuminate the potential contributions of AFS in household food security, and identify where there are gaps so that appropriate action may be taken to ensure they can continue their essential role within urban environments.

7. References

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