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Faculty of Economic and Management Sciences

Institute for Social Development

Critical Evaluation of the Impact of Urban Agriculture on Food Security: Case study of Urban Food Gardens in Kayamandi settlement in Stellenbosch, Western Cape

A mini-thesis submitted in partial fulfilment of the requirements for the degree of Master of Arts in Development Studies at the Institute for Social Development, Faculty of Economic and Management Sciences, University of the Western Cape.

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March 2019

Abstract

This research investigates the impact of urban agriculture on food security through urban food garden projects in Kayamandi. Food insecurity is a major global challenge, 795 million people in the world suffer from hunger and malnutrition and 780 million of these are from developing countries. In South Africa, poverty, unemployment, and inequality play pivotal roles in the dynamics of food security. These indicators have shown that chronic poverty and food insecurity are mostly found in urban and peri-urban areas, affecting the most vulnerable groups such as women, children, and the elderly. In addition, food insecurity exists in Cape Town. In 2008, 80% of poor households in Khayelitsha, Philippi and Ocean View were either moderately or severely food insecure. Similarly, in Manenberg, a study revealed that 64% of the households were food insecure. Only 18% of poor households were food secure compared to the 74% and 94% for middle and high income households. Although there is numerous research on food insecurity in Cape Town, the contribution of urban agriculture to household food security in Kayamandi has not been addressed adequately. This study assessed the current state of food security in the Kayamandi settlement. The study also identified the impact of urban agriculture on food security in Kayamandi, as well as investigating the outcomes of an urban agriculture project in Kayamandi provided by the NGO, Love2Give. Qualitative research method was used to deeply understand the extent in which urban agriculture contributes to food security. In this process, 12 participants were purposively selected from the urban gardeners of the Love2Give organization including 2 key informant interviews. The Sustainable Livelihoods approach was applied to this study in order to understand the role Love2Give plays in building a sustainable community. As a theoretical framework, the Sustainable Livelihoods approach identified the mechanism Kayamandi gardeners use to secure their household food security. This is in alignment with the initial hypothesis, which is that Kayamandi households are food insecure. The majority of the participants in Kayamandi were either moderately (33.3%) or severely (33.3) food insecure whilst only four households were food secure (33.3). The high food insecurity in the area can be attributed to the high unemployment rate of 84% of the participants. Urban agriculture contributes to the household food security of participants. 75% of respondents engaged in urban farming for consumption purpose while the rest practice urban farming to generate income. Although participants generate little income from urban cultivating, it contributes significantly to their lives especially when they mix this with other livelihood diversification methods. Lack of water, land and enough farm equipment hinders the potential impact of

urban agriculture. Therefore, there is a great need of intervention from multi-stakeholders such as NGOs, government and municipal authorities to intervene and promote urban agriculture as a means to reduce poverty and food insecurity.

Key words: Urban Agriculture, Sustainable Livelihoods Approach, Food Security, Community Gardens, Poverty, Nutrition, Kayamandi, Stellenbosch, Cape Town

Declaration

I declare that *Critical Evaluation of the Impact of Urban Agriculture on Food Security: Case Study of Urban Food Gardens in Kayamandi Settlement in Stellenbosch, Western Cape* is my own work, that it has not been submitted before for any degree or examination at any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Abdikarim Ahmed Salah

Signed……A.A.S……

March 2019

Dedication

I dedicate this research to my beloved Mother.

Acknowledgments

Firstly, I would like to thank my thesis advisor Dr. Abdulrazak Karriem of the Institute for Social Development at the University of the Western Cape. The door to Dr.Abdulrazak Karriem's office was always open for me whenever I ran into a trouble spot or had a question about my research or writing. He consistently allowed this paper to be my own work but steered me in the right direction whenever he thought I needed it.

Secondly, I would also like to thank Ms. Priscilla Kippie for her administrative support at the Institute for Social Development.

Thirdly, I would also like to acknowledge Mr. Mohamed Djemilou of the School of Business & Finance at the University of the Western Cape as the second reader of this thesis, and I am gratefully indebted for his very valuable comments on this thesis.

Fourthly, I would like to thank my two very close friends Miss Thulile and Miss Awodwa for helping me as translators during my fieldwork.

Finally, I must express my very profound gratitude to my cousins Mohamud and Muhyiddin as well as my Uncles Dahir Mohamed (Baasto) and Mohamed Abdullahi (Abukun) for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without them.

Thank you all.

Abdikarim Ahmed Salah

Abbreviations and Acronyms

CCT	City of Cape Town
FAO	Food and Agriculture Organization
HFIAS	Household Food Insecurity Access Scale
IDP	Integrated Development Plan
MDGs	Millennium Development Goals
SANHNES	South African National Health and Nutrition Examination Survey
SDGs	Sustainable Development Goals
SLA	Sustainable Livelihoods Approach
SLF	Sustainable Livelihoods Framework
SM	Stellenbosch Municipality
SSA	Sub-Saharan Africa
UA	Urban Agriculture
UNGA	United Nations General Assembly
UN	United Nations
UFSB	Urban Food Security Baseline
WFS	World Food Summit

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CHAPTER ONE: INTRODUCTION TO THE STUDY

1.0. Introduction

The issue of food insecurity is a major problem in the world (FAO, 2015). Tackling food insecurity is, therefore, a major component in the global fight against hunger. It is projected that in 2030 the demand for agricultural products will increase by 50% as the world population increases (Wheeler and von Braun, 2013). Wheeler and von Braun stated that about 2 billion world population of 7 billion are food insecure. Additionally, about 850 million people are undernourished globally. In 2000, the United Nations endorsed the Millennium Development Goals (MDGs) for the commitment to tackle global food insecurity (United Nation, 2014). Although some countries met some MDG goals, food insecurity and hunger remains a challenge of global development. The MDGs were changed to the Sustainable Development Goals (SDGs) by the United Nations with 17 goals. These are to be achieved by 2030, with Zero Hunger being one of the ultimate targets in the next 15 years (Kirkland, 2008). Despite these efforts, the world still suffers from poverty and food insecurity. Economically, more than 800 million people around the world still earn less than $1.25 a day (Lal, 2013), while 795 million people suffer from lack of food, of which 780 million of those affected live in developing countries (FAO, 2015).

According to Wheeler and von Braun (2013) and Hendriks (2014), food insecurity is a threat to both national and international households. In South Africa, 26% of the population was food insecure in 2013, with a further 28.3% at risk of hunger (Hendriks, 2014). The majority of the food insecure were those who live in urban areas, 32.4% and rural areas, 37% (Crush and Frayne, 2011). Categorizing by race, the Black community had the highest prevalence of food insecurity with 30.3%, followed by the Coloured community with 13.3%. Additionally, 28.5% of Indians were also at risk of food insecurity while 89.3% of the White population were food secure (Shisana et al., 2013). The City of Cape Town prides itself as being one of the best cities in South Africa, but ironically only 18% of poor households within Cape Town were food secure compared to 74% and 94% of middle and high-income households (Battersby et al., 2014).

Similarly, the Urban Food Security Baseline Survey (UFSBS) conducted research in 2008 in the cities of Johannesburg, Cape Town and Msunduzi which showed 70% of urban dwellers lived in conditions of food insecurity (Frayne al, 2009). Although there is a constitutional

right to food in South Africa, food insecurity still persists. Socio-economic conditions such as poverty, unemployment, and inequality play a pivotal role in the dynamics of food security in South Africa. These indicators have shown that chronic poverty and food insecurity cannot be considered a rural problem, but rather both urban and rural. The implication of food insecurity hits vulnerable groups such as children, elders, women, and disabled groups the hardest (Mollatt, 2014:30).

Cities need to look for sustainable ways of tackling poverty and food insecurity in urban areas. One such option that receives a lot of encouragement from policymakers is urban gardening, which offers important benefits for urban cultivators such as improved nutrition, food security, and income (Haysom, 2015). There have been numerous national surveys on food security in Cape Town. For example, surveys have been conducted in areas such as Khayelitsha, Philippi, Ocean View, Manenberg, Masiphumelele, and Nyanga. All these studies show a high level of food insecurity (Radmore, 2015:21). This study looks at the impact of urban agriculture on food security in Kayamandi and also investigates what mechanisms Kayamandi residents use to tackle poverty and food insecurity. More specifically, the study critically evaluates Love2Give's urban garden projects in Kayamandi, Stellenbosch. The following questions will lead the research: What is the level of food security in Kayamandi Township? What contribution does the Love2Give urban agriculture project make to the food security of Kayamandi residents?

1.1. Statement of the problem, research questions and aim of the study

1.1.1. Statement of the problem

Urbanization, poverty, food insecurity and urban poverty are key developmental challenges facing urban areas. By 2020 developing countries alone will be home to 75% of all urban dwellers (Baudoin and Drescher, 2008). Cities in the global South have great worries for managing mass migration and development due to a lack of formal employment opportunities for the poor. Climate change and unstable food prices add to the problem. Food insecurity has been, and remains, a lingering challenge within cities such as Cape Town (SM, 2015).

There is a growing awareness about the role that UA can play in alleviating or addressing food insecurity and poverty for urban dwellers (Baudoin and Drescher, 2008). UA can be a means to increase local economic development, alleviate poverty and empower the urban poor through social inclusion. Candice and Schulschenk (2011:653) note that although there is a potential opportunity for urban agriculture in Stellenbosch, poor households in areas such

as Kayamandi do not have access to land to farm on. Van Vuuren (2016) stated that the current food system in the Stellenbosch municipality has multiple weaknesses, particularly when viewed through the lens of urban food resilience. Kayamandi is a poverty-stricken area, with high unemployment and poverty rates (Census, 2011). Additionally, almost 25% of Kayamandi residents have no income, and educational attainment is low (Petzer, 2015:75; Ewert, 2017).

1.1.2. The aim of the study

The aim of the study is to explore the impact of urban agriculture on food security in Kayamandi Township by examining food garden projects run by the Love2Give NGO.

1.1.3. Objectives of the study

- To identify the impact of urban agriculture on food security in Kayamandi
- To investigate the role of the Love2Give food garden project in Kayamandi in impacting food security.
- To find the sustainable livelihood mechanisms poor households in Kayamandi use for their daily survival

1.1.4. Research questions

What is the state of food security for urban gardeners of Love2Give, Kayamandi?

What are the contributions from Love2Give to urban gardeners in Kayamandi?

What are the livelihood strategies Love2Give urban gardeners use to diversify their livelihoods?

1.1.5. Rationale and significance of the study

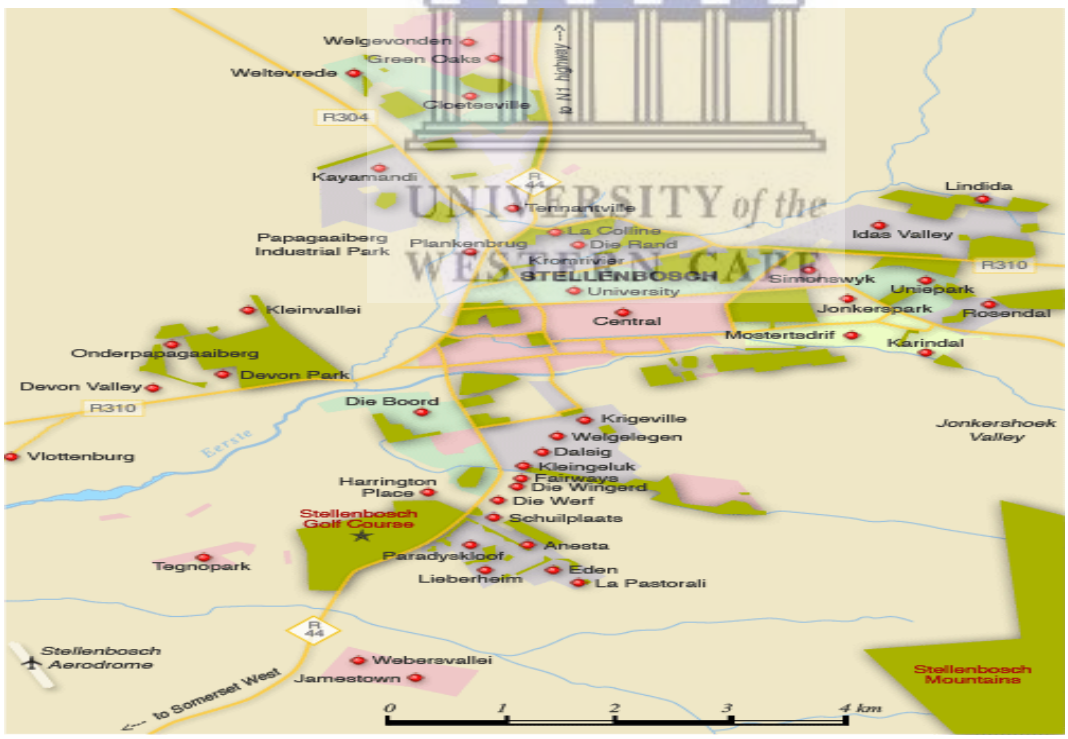
The rationale of the research is a set of reasons offered by a researcher for conducting more research into a particular topic (Babbie and Mouton, 2001). As a result of urbanization, poverty, unemployment, and high food prices, millions of people struggle to meet their basic needs. Similarly, inequality and the lack of access to sufficient and nutritious food are widespread in poor urban neighborhoods. For the first time in history, the world has seen more people in urban than in rural areas (CCT, 2013). The municipality of Stellenbosch is no exception and faces numerous challenges, including food insecurity and malnutrition. Like other South African towns, Stellenbosch is divided between rich and poor, wherein the rich live a comfortable life and the poor are struggling to meet their basic needs (IDP, 2013).

Love2Give implements urban gardening projects which seek to increase the food security of residents in Kayamandi. Even though there is a lot of research on urban agriculture and food security in the Cape Town metropolitan area, there has been little research on urban gardening and food security in Kayamandi settlement. This research, therefore, critically evaluates the impact of urban agriculture on food security in the Kayamandi settlement.

1.2. Background to the case study area: Kayamandi Township, Stellenbosch

Stellenbosch municipality is located in the Cape Winelands District, about 50 km from Cape Town. It is the second oldest town in South Africa dating back to 1679. The town is surrounded by agricultural land, which mainly produces grapes and has a strong tourism industry. The population of the area is estimated around 167 572 with 48 008 households, the majority of the population in Stellenbosch is Coloured at 52.2%, followed by Black at 28.1% (SM, 2013). The White and Indian/Asian communities comprise 18.5% and 0.4%, respectively (Stellenbosch Municipality, 2015:1).

Figure 1.1. Map of Stellenbosch



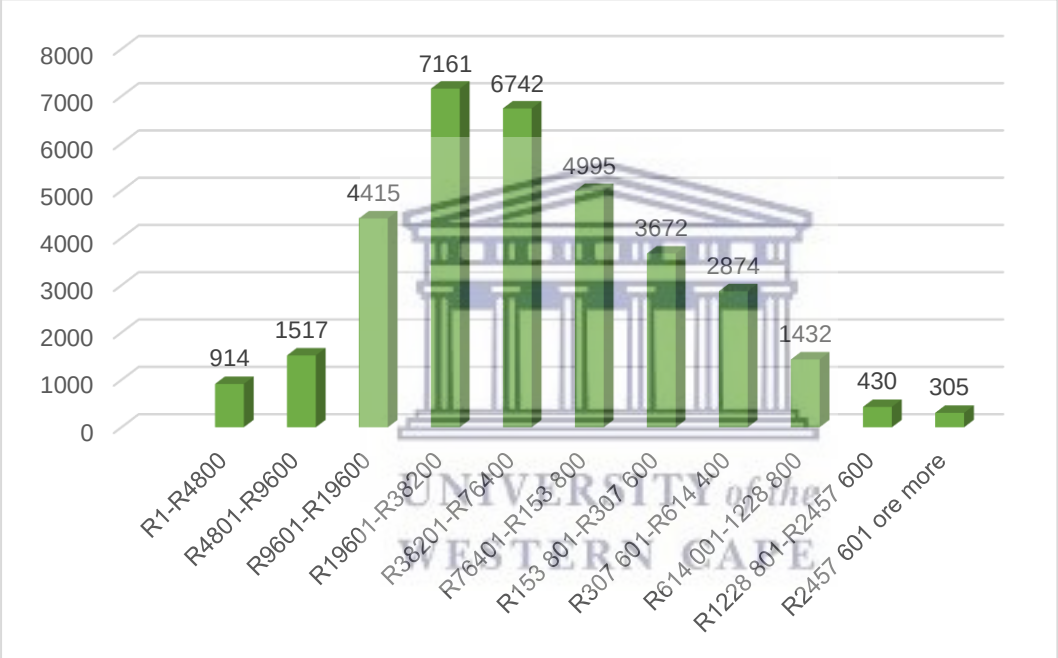
Source: Google Maps, 2013

The Stellenbosch municipality is composed of 19 wards consisting of the following areas; Stellenbosch Town, Townships (Kayamandi, Cloetesville, Idas Valley and Jamestown), Franschhoek, De Novo, Muldersvlei, Klapmuts, Elsenburg and Koelenhof (to the north of

Stellenbosch) and Vlottenburg, Lynedoch, Raithby and Jamestown (to the southwest of Stellenbosch)

In general, the level of poverty in the Western Cape Province is 40.1% while the City of Cape Town stands 39.3% (Western Government, 2016). Some parts of the municipality are experiencing high levels of food insecurity (Kelly and Schulschenk, 2011). In Stellenbosch, the current level of food security is estimated to be 28% (Robert, 2011). The area is one of the richest municipalities in Western Cape but it is also one of the most unequal municipalities in the province.

Figure 1.2. Distribution of Household by Annual Household Income in Stellenbosch



Source: SM, 2015

Figure 1.2 shows the distribution of household by income in Stellenbosch municipality. 43% of the households fall between the categories of R19 601 to R153 800 annually while 914 households, 2.1% fall within the category of R1-R4 800 (SM, 2015). Although the majority of these are households earning a stable income, those within the category of R1 to R19 600 are likely to face poverty and unemployment. However, The National Development Plan (NDP) seeks to reduce inequality and poverty in South Africa and planned to have zero households earning less than R418 per month by the year 2030. Currently, 914 households in Stellenbosch municipality earn less than R4 800 annually, which would force these poor households to sacrifice their food items in order to buy non-food items (SM, 2015:12).

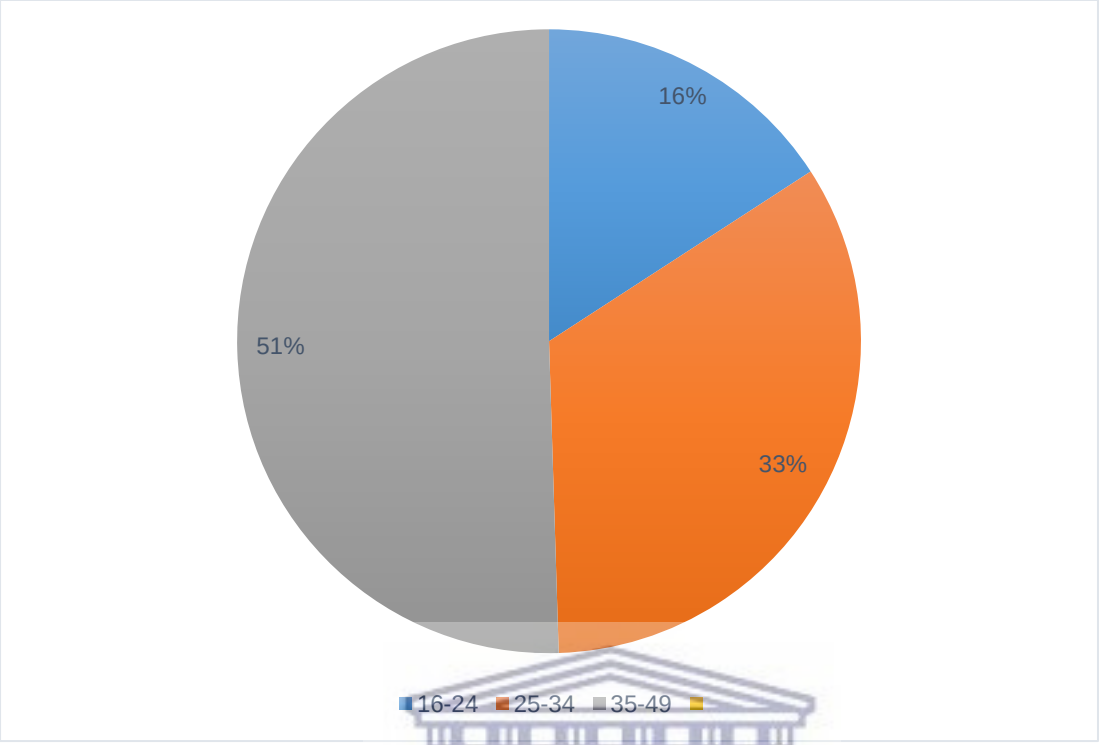
Figure 1.3. Map of Kayamandi

Source: Google Maps, 2018

Kayamandi is a suburb of the Municipality of Stellenbosch. Kayamandi Township is an area of 1.54 km2 with a total population of 24 645, the majority of the population are female at 50.08%, while men account 49.92% (SM, 2014). The settlement was founded in 1950 as part of the increased segregation of the apartheid era with 95% of the people who live there being Xhosa speakers and 5% Coloured. Moreover, 76% of Kayamandi Township residents live in informal houses and backyard "shacks" while 23% live in formal houses. In the greater Stellenbosch municipality area, 90% of families live in formal houses. Furthermore, 17% of Kayamandi residents do not have electricity (Stellenbosch Municipality, 2013).

Economically, Kayamandi Township faces a high unemployment rate of 22.3% (Tom, 2015). The employment rate seems low compared to the national rate, which is 27%. The low rate of unemployment could be linked to the low unemployment rate of the Stellenbosch municipality (11.9%) (SM, 2017). The following pie chart demonstrates the level of unemployment in Kayamandi Township

Figure 1.4. Kayamandi Employments by Age



Source: Stellenbosch Municipality, 2012

The pie chart indicates that the 35-49 age group constitutes the majority of employed people in Kayamandi at 51%, followed by the 25-34 (34%) and 16-24 (16%) age groups. To explain this further, there is high youth unemployment in the area which leads to many social problems such as crime. In Kayamandi Township, the majority of the people struggle to get adequate sanitation which poses a serious health problem that reduces the dignity and safety of the people (Van Vuuren, 2016). Kayamandi Township also encounters many social ills, such as poor living condition, and a low level of education, high rates of unemployment and poverty (Petzer, 2015).

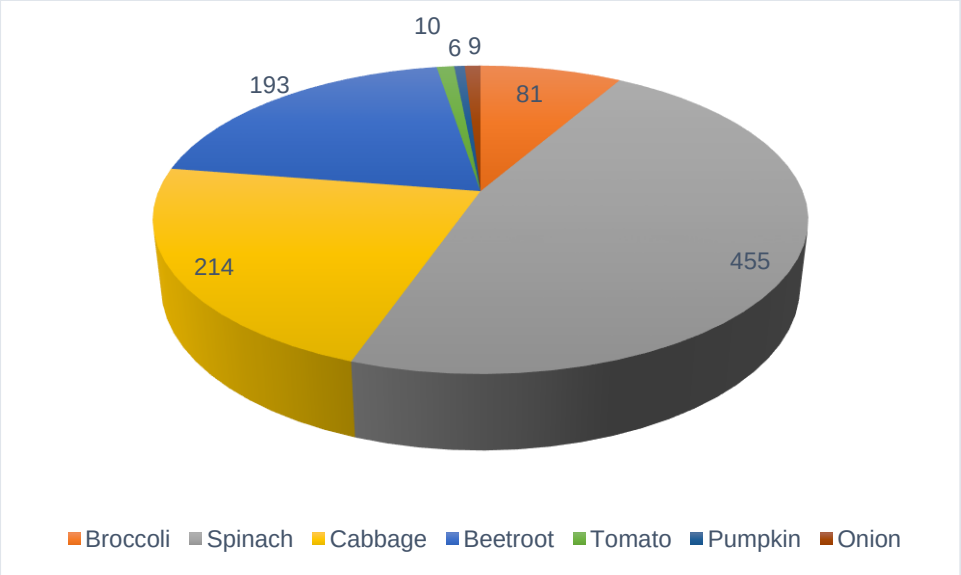
According to Love2Give (2015), poor households in Kayamandi struggle to feed themselves. The majority of those who struggle to match the standard of the municipality live in black-dominated areas such as Kayamandi settlement. Due to the low income in the area, residents in Kayamandi struggle to meet their daily needs (SM, 2015). Poor households in Kayamandi also lack purchasing power which limits their dietary needs and that forces them to buy cheaper options of food which have a high carbohydrate content and a low nutritional value (Van Vuuren, 2016).

1.3. Case study organization: Love2Give

Love2Give is a non-governmental organization created by a group of friends who live in Kayamandi Township. The organization was established in 2005 to support those who are trapped in a cycle of poverty. The aim of Love2Give is to provide food and empowerment to its beneficiaries. The organization focuses on children from poor families and provides food parcels to 14 crèches, 3 primary schools and 2 high schools. It also supports the parents of the children by empowering and teaching them skills such as food gardening. This provides nutritional meals to school children and their parents through urban gardening. The organization also provides sustainable livelihoods programmes such as offering food for 100 mothers for six months and creating income-earning opportunities through training and mentorship programmes such as skills training, micro-business courses, and vocational counseling (Love2Give, 2016/17).

Since the beneficiaries of Love2Give are poor and vulnerable individuals, the organization creates a holistic relationship with the families who are on their programme. Besides the sustainable livelihood programmes, the organization has formed a healthcare worker's network who do home visits to assess and understand the circumstances of their beneficiaries. Additionally, Love2Give expects all their adult beneficiaries to engage in urban gardening to increase the level of food security in the area. This will also improve the range of micro-nutrients available in the diets of the families (Love2Give, 2016/17). Furthermore, Love2Give holds a biannual vegetable garden competition called "Gorgeous Garden", which promotes urban gardening, whether it's a home garden or a community garden. Figure 1.4 shows the variety of vegetables Love2Give gardeners produce. The vegetables include Broccoli, Spinach, Cabbage, Beetroot, Tomato, Pumpkin, and Onion.

Figure 1.5. Love2Give community garden harvest (kg)



Source: Love2Give, 2016/17

1.4 Chapter outline

***Chapter One: Introduction and background*:** The first chapter provides a brief background and introduction to the area of study, and outlines the research problem, research questions, and aims and objectives.

Chapter Two: Literature review: This chapter reviews the studies on urban agriculture throughout the world, including in the case study area. It also discusses the state of food security at the international and local levels and introduces the reader to the importance of urban agriculture on food and nutrition security.

***Chapter Three: Theoretical framework*:** This chapter focuses on the theoretical aspect of the study. It provides the background of the Sustainable Livelihoods Framework and its elements, and how it supports and builds sustainable livelihoods.

***Chapter Four: Research methodology*:** This chapter outlines the research methods undertaken, and provides an overview of the socio-economic and demographic/data of the case study area.

***Chapter Five: Data analysis and data presentation*:** This chapter focuses on the analysis of the findings of the research. It builds a logical connection between the literature, the theoretical framework, and the research questions.

***Chapter Six: Summary of findings, recommendations, and conclusions*:** The final chapter concludes and summarises the findings of the study, and provides some policy recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

The aim of this research is to critically evaluate the impact of urban agriculture (UA) on food security in the Kayamandi settlement, Stellenbosch. In order to understand the scope and impact of UA on food security in Kayamandi, this chapter holds great importance in guiding and investigating the gap this research could fill in the literature. This chapter discusses the literature review of the study by covering the role of UA at the global, South African and provincial scales. Subsequently, the state of food security in South Africa, Cape Town and Stellenbosch will be discussed. Additionally, this chapter will look at the impact of UA on food and nutrition security.

2.1. Urban agriculture

The world is experiencing an increased number of people who are engaging in UA (Armar-Klemesu, 2000). The literature suggests that due to the rapid urbanization, 60% of the world's population is projected to live in urban areas by 2050 (De Zeeuw, et al., 2011). Urban agriculture in cities is seen as an important instrument to tackle poverty. It is practiced around the world, with more than 200 million people estimated to work in urban farming related enterprises, which provide livelihoods to more than 800 million urban dwellers (Zezza and Tasciotti, 2010). Additionally, 25-30% of urban dwellers are involved in the agro-food sector worldwide (Orsini et al., 2013). Poulsen et al. (2015) indicate that in developing countries, urban gardeners who generate income from UA range between 3-71%, with some countries showing more than 50% (Madagascar 63%, Nigeria, 71%).

Furthermore, the practice of UA can be engaged in as a group, an individual, or as co-operatives (Grote, 2014). It situates within cities and consists of diverse production structures, starting from subsistence production and processing at the domestic level to full commercialization. Moreover, it is a technique designed for urbanites to produce food within cities for consumption and commercial purpose. The term UA can be defined as "a process of growing vegetables and rearing animals within cities and surrounding areas for food and income purposes" (Veenhuizen, 2006:78). Similarly, the City of Cape Town defined UA as "a process of production, processing, marketing and distribution of crops and animals and products from these in an urban environment using resources available in that urban area for the benefit largely of residents from that area" (CCT, 2007:5).

UA is practiced in both developed and developing countries. In recent times, the role of UA in promoting food security and poverty alleviation has become the theme of interest for policymakers (Zezza and Tasciotti, 2010; De Zeeuw, 2011). Poulsen et al. (2015) noted two important aspects that contribute to food security through the use of UA. Firstly, when families produce their own food, they are more likely to eat nutritionally rich food. Secondly, household food expenditure may also be reduced, allowing households to invest in other household needs. In addition, the impact of UA on improving nutritional status has been noted in Kampala, Uganda (Poulsen et al., 2015). In countries such as Nigeria, Malawi, Ghana, and Madagascar, data has shown that those who practice UA consume nutritional food which increases their health status. Similarly, in Harare, Zimbabwe, urban farming is seen as an important practice for food security in the poorest areas (Cofie, 2003).

Research by Zezza and Tasciotti (2010) in Africa, Asia, and Latin America has shown that UA accounts for 5-15% of total agricultural production of the countries sampled. Although UA is considered the survival strategy of the poor, the study indicates that the extent to which UA alleviates poverty is unknown. However, it cannot be neglected due to its connection with healthy diets by providing vegetables and fruits. UA can be economically significant to the urban dwellers for providing income through selling produce (De Bon et al., 2010; Mkwambisi, 2009). Egziabher (2014) noted that in Kenya and Tanzania two out of three families are practicing some form of UA. In Lilongwe, Malawi urban spaces are used by informal cultivators for maize production.

Furthermore, in Cuba, people practice UA as a means to satisfy their household food needs and use UA as a substitute, due to the partial blockage issued by the United States. In the process, Cuba has developed one of the best UA models in the world, and in Havana alone, more than 35 000 hectares of land is used for urban farming (Egal, 2001). Additionally, urban agriculture addresses many of the socio-economic issues faced by cities through participatory planning. The municipality of Governador Valadares in the State of Minas Gerais in Brazil faced problems such as unemployment. The state introduced multi-stakeholder projects in which the municipality integrated UA into the development plans (Thom and Conradie, 2012). The aim was to reduce poverty, create employment for the urban poor, and increase income levels of the people in the area (Van Veenhuizen, 2006).

Additionally, UA plays a vital role in improving the environment through the re-use of wastewater and organic waste (World Bank, 2013). It also helps urban gardeners fight against

the impact of climate change through building a climate compatible city. More broadly, UA reduces the vulnerability of urban residents and strengthens community-based adaptation management. Finally, the practice of UA creates an environment of social inclusion by integrating the disadvantaged such as women, the unemployed, the elders and the disabled (Orsini et al., 2013). Moreover, UA improves the relationship between institutions and disadvantaged communities, in this way making access to land, credit, and markets possible to the urban poor. Additionally, when urban gardeners engage in UA, their interpersonal relationships are strengthened.

2.1.1. Characteristics of urban agriculture

There are many characteristics of urban agriculture in the literature. De Bon et al. (2010) argue that the homogeneity of the practice of urban agriculture is the major feature. Individuals participating in UA are diverse in terms of socio-economic backgrounds. Urban gardeners do not only engage for the benefit of income and food but also for other reasons such as wellness, exercise, and alternative lifestyles (Galhena, 2013). The majority of urban gardeners are those at the bottom of the ladder (low-income). Due to their dependency on remittance/welfare, these communities diversify their income through urban agriculture so that their households can be food secure (Mthethwa, 2012). While wealthy households also practice urban agriculture, they constitute a smaller portion of urban gardeners. In South Africa, a study done by Labour Force Survey stated that the ultra-poor households have the highest percentage (39%) of urban farming while the poor and wealthy have 22% and 3% respectively (StatsSA 2006). These numbers indicate the relationship between the income category groups and urban agriculture.

Furthermore, Onyango (2010); Galhena et al., (2013) categorize UA in four categories: firstly, home subsistence gardeners, which refer to households who practice urban agriculture for consumption proposes. The second typology is a multi-cropping category, which also refers to households who cultivate a mixture of crops predominantly for subsistence but who also sell a portion of their produce to boost their income. The third typology of farming represents a family owned commercial farm in urban and peri-urban areas whose main objective is to make money. Finally, the fourth category is entrepreneurial farming, which refers to big commercial farmers with a huge capacity to engage in large-scale production for domestic markets and trade. The difference between the third and fourth category is that one is family owned farming with the purpose of making money with limited capacity to produce

more while the fourth category has the capacity to produce more. In other words, the first and second category is practiced by low-income households while the third stands for middle-income households and fourth stands for wealthy farmers (De Bon et al., 2010). These typologies indicate that the income category of households contribute to their role in practicing urban agriculture.

Furthermore, the other important characteristics of urban cultivators are their educational status (Egziabher, 2014). According to a study conducted in Orange Farm, a low-income neighborhood, in south Johannesburg found that 80% of urban farmers sampled had primary school education or less (Mthethwa, 2012). Similarly, less than half (42%) of the sampled were formally employed (Onyango, 2010). These indicators correspond with those of low-income households. However, there is an argument that says urban agriculture is not for the poor of the poorest (Webb, 2011). According to this perspective, poor people do not have access to credit, land, financial resources and equipment, which excludes them from practicing urban agriculture.

2.1.2. Urban Agriculture in South Africa

Urban Agriculture in South Africa is a complicated phenomenon. Olivier (2015) argues that the scale of UA in South Africa is very small compared to other developing countries, especially in Africa. Due to the legacy of apartheid, poor people in urban areas struggle to find spaces to farm. In townships, those who happen to have space prefer to build shacks for habitation or to rent and generate some income, using it for agricultural purposes. Additionally, Webb (2011:205) states that "urban agriculture in South Africa does not provide the benefits so often attributed to it". Similarly, Rogerson (2011) suggests that UA offers fewer benefits to marginalized communities in cultivation due to their lack of access to land. In contrast, some view UA as a survivalist strategy implemented by marginalized groups to escape hunger and food insecurity (Altman et al., 2009). Consequently, UA as an activity is not the most significant means of survival for urban gardeners in South Africa, although it represents an important strategy to secure food and sometimes to generate income. In fact, social grants are a major survival strategy for the urban poor. For instance, Thornton (2008) found that in Rhini and Peddie in the Eastern Cape, social grants remain a major survival strategy for poor households.

Furthermore, different studies demonstrated the role UA plays at the household level and what contribution it makes. For instance, Webb (2011) found in Bophuthatswana that

cultivator and non-cultivator households have no difference in terms of dietary and nutritional status. Similarly, Slater (2001) found that UA can be viewed through the perspective of personal and social terms. The participants of this study from Slater were women cultivators and expressed their role of cultivating as a way to express their emotional and locational stability, empower themselves and create social networks. Kasumba (2007) measured UA through a sustainable development perspective using the following aspects: contribution of UA to cultivating households, food security, environmental benefits, and social and psychological gains. The study found minimal employment through cultivation, while the environmental benefits were modest, and social and psychological (e.g. greater food security, improved nutrition, higher cash incomes as result of selling produce and improved employment status) gains perceived as a positive. Moreover, Thornton and Nel (2007) argue that UA is a low-key activity in Peddie due to social grants from the government, which provides financial stability to low-income households. However, the researcher suggests that despite its insignificance UA carries some potential, as it diversifies the income or provides access to nutritious food (e.g. vegetables) to poor families.

Urban agriculture has received increased attention over the last three decades due to increased inequality and marginalization within cities. According to Frayne et al. (2009), 77.31% of those living below the Minimum Living Level (MLL), live in the core urban areas. It has been predicted that without proper management and plans, there could be millions of people facing high levels of unemployment, crime, ill-health and inadequate service provision (Battersby, 2016). In this regard, urban agriculture gained attention as a means to alleviate urban poverty and food insecurity (Crush et al., 2013). However, the majority of those who engage in urban agriculture remain predominantly female-headed households. Not surprisingly, the average age of urban gardeners tends to be high, at around 65 years of age while in Zimbabwe the age range of the urban gardeners are younger, around 36-45 (Pedzisai et al., 2014; Ziga, 2018). However, the youth have less interest in UA and view it as something their parents and grandparents were forced to carry out due to apartheid policies. Thus, they have no desire to engage in UA farming.

Finally, in recent times both government agencies and non-governmental organizations (NGOs) have supported UA and granted financial support to urban gardeners in order to boost their livelihoods. For example, in Durban, the council promoted various small community gardening projects (Beall et al., 2004). The practice of UA increased after the end of apartheid due to the rapid urbanization, high food prices and unemployment within the

formal economy. It has become a survival strategy for the newly urbanized poor communities. Cultivating within the city, poor households could meet some of their food needs and generate some income by selling surplus produce (Crush et al., 2011). Regarding UA in South Africa, it seems the government and NGOs are acknowledging the impact of UA on the lives of the urban poor.

2.1.3. Urban agriculture in Cape Town

There has been a growing concern in the use of UA as a means to address food security in Cape Town (Battersby and Marshak, 2013). In 2007, the City of Cape Town recognized the potential of UA and implemented the first UA policy in South Africa (Battersby, 2012). The major aim of the policy was to empower the poorest of the poor through UA as a survival strategy (CCT, 2007). Through this policy, the city seeks to promote the links between government and NGOs to promote UA by legitimizing public support in terms of participation, infrastructure, and land provision. The main purpose of the policy was to establish a public platform where public, private and civil society can cooperate to create sustainable livelihood opportunities for the poor (CCT, 2007).

Furthermore, there are numerous organizations within the City of Cape Town that provide training and support to urban cultivators such as Abalimi, Soil for Life, and Love2Give. Since the City of Cape Town is friendly towards UA, the number of urban cultivators in Cape Town increased from 723 in 2002 to 1767 in 2007 (Crush et al., 2011), and the latest estimates are set to more than 4000 cultivators (Labadarios, 2011). Nonetheless, despite these numbers, UA makes a very low contribution (5%) to household food security in Cape Town (Crush et al., 2011). Moreover, the in-migration of populations from rural areas and from abroad to Cape Town is raising a concern of food security since the food system of the city is becoming unstable due to the rapid growth of the population (Geyer, 2011). In the context of high unemployment and underemployment, the poor struggle to purchase food and other basic necessities.

Moreover, the majority of NGOs operate in low-income areas such as Kayamandi, Khayelitsha, Nyanga, and Philippi to mention few. These organizations actively promote UA and help urban cultivators by providing support services. Despite all the support, Crush et al. (2011) argue that UA has limited impact on food security. For instance, research has suggested that areas engaged by local NGOs, 96% of those living in urban areas have never eaten home-grown food, which indicates the insignificance of UA on food security (Battersby

and Marshak, 2013). In other words, the majority of urbanites only buy their food from a supermarket rather than growing their own food. Similarly, research by the African Food Security Urban Network (AFSUN) in Cape Town, Msunduzi and Johannesburg found a limited uptake of UA, as well as the low frequency of homegrown production. In Msunduzi, 30% of sampled households sourced food from their own production while less than 1% did the same in both Cape Town, Johannesburg (9%), Gaborone, Windhoek (3%) and Lusaka (3%) (Crush et al., 2011). The researcher stressed that poor people practice urban farming to supplement their nutritional intake, while higher income areas practice it for environmental or leisure reasons (Frayne et al., 2014). However, these cities acknowledge that UA can initiate jobs, and promote environmental benefits and household food security (Van Der Merwe, 2003).

2.1.4. Urban agriculture in the Stellenbosch municipality

The Municipality of Stellenbosch (SM) is ideal for agricultural production, and the majority of the production is grown outside the city. The agricultural sector of the town focuses more on commercial farming; grapes hold the biggest percentage for land use with 71.5%, followed by peaches with 9.6% (StatsSA, 2006). Haysom (2010) states that the Stellenbosch Municipality has the potential to create a sustainable food system, which can satisfy local food demand without depending on imported food from outside the town. Similarly, the lack of purchasing power within the poor households has led to the creation of 31 food relief projects in the Stellenbosch area. These include 10 individual food garden development projects, 9 faith-based feeding schemes, 5 soup kitchens, 3 non-faith NGOs, 2 faith-based soup kitchens, 1 community food garden development project and 1 NGO (SM, 2015). Some of these organizations were run by local government and faith-based organizations. Moreover, four community gardens have been identified in the Kayamandi Settlement (Heart of Kayamandi, Prochrus, Kuyasa, and Love2Give). These organizations are non-governmental organizations run by community members. Some organizations have multiple gardens to run, but Love2Give runs only one garden which is located in the school backyard. These organizations carry out different kinds of community work but one thing that unites them is the encouragement of the practice of urban agriculture (SM, 2015).

Furthermore, the SM has the capacity to serve as a pilot for an urban agriculture project as an example of a sustainable solution. The municipality also has the financial, intellectual and urban spaces that can benefit from successful urban agriculture (Schulschenk, 2009). Regarding these resources, the municipality has the intention to transform itself into an

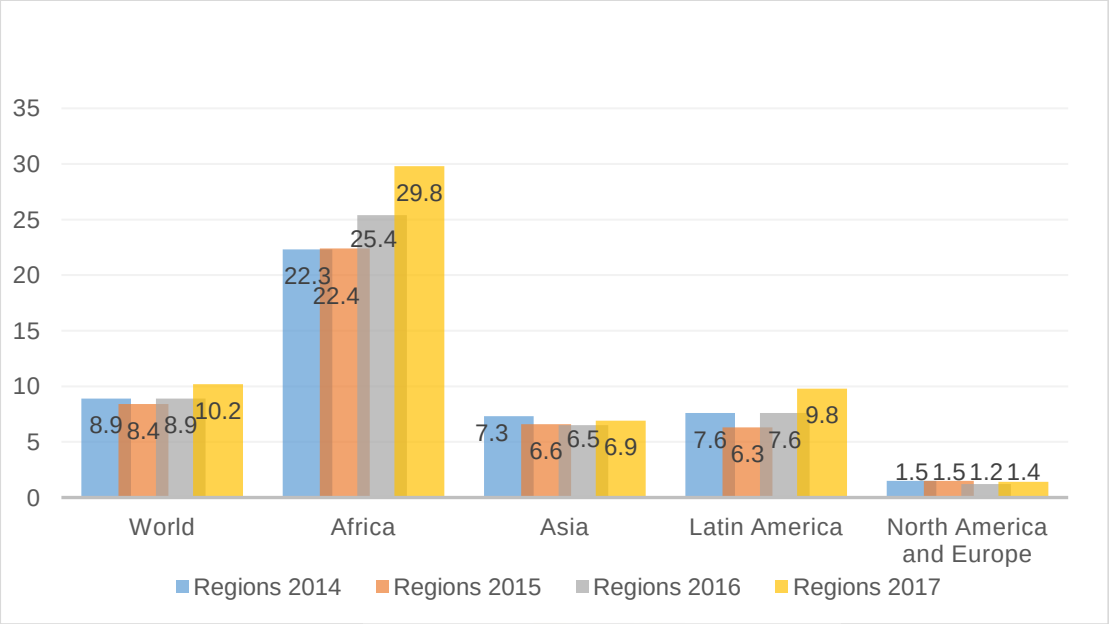
innovative green municipality. Haysom (2015) argues that the responsibility to transform the municipality and ensure food security is both on the government, civil society and the private sector agenda. Moreover, Stellenbosch has diverse stakeholders in the public and private sector that can push to implement urban agriculture projects for achieving sustainability. In terms of spatial resources, land for UA is the main concern for policymakers although there are open spaces that are not utilized in a productive way (Van Vuuren, 2016).

According to Van Vuuren (2015), the SM has a number of public parks, which are neglected by the municipality and not used by communities because they are viewed as dangerous places. Van Vuuren argues that the municipality should utilize the land in a productive manner and suggests that the SM can emulate cities like Montreal, Canada, Quito, Ecuador and Rosario, Argentina which transformed some municipal parks into community gardens. This is one way in which SM could achieve the status of becoming the innovative capital of South Africa.

2.3. Food and nutrition security

The term food security has been an issue since 1948 after the Universal Declaration of Human Rights which states that "everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food" (Armar-Klemesu, 2000:99). Similarly, the International Covenant on Economic, Social and Cultural Rights further affirmed the "right of everyone to be free from hunger" (De Schutter, 2014:3). This indicates the importance of recognizing food security as a fundamental human socio-economic right for human beings. Moreover, the food security concept reached another height in 1974 at the World Food Conference when world food supplies were low and food shortages were imminent. This led to a general concern from the international community, which forced the world to increase domestic agricultural production. After 70 years since the founding of the Universal Declaration of Human Rights access to sufficient, safe and nutritional food is far from becoming a reality. Figure 2.1 shows the extent to which food insecurity increased across all continents in 2017.

2. 1. State of Food Security in the World



Source: FAO, 2018

Figure 2.1 indicates that food insecurity at a global scale increased in 2017 compared to 2014. Globally, food insecurity increased from 8.9% to 10.2%. While the highest increase occurred in Africa where the number increased from 22.3% to 29.8% followed by Latin America that increased from 7.6% in 2014 to 9.8% in 2017. Additionally, Asia also experienced a food insecurity increase from 7.6% in 2016 to 6.9% in 2017. Finally, North America and Europe experienced the lowest rate of food insecurity increased from 1.2% in 2016 to 1.4% in 2017. Despite growing global food production, food security remains one of the biggest challenges in the world. There is a great need to ensure food for millions of households living in poverty in different parts of the world.

Moreover, the number of people experiencing food insecurity in the world is worrisome. According to the FAO's (2018) Food Insecurity Experience Scale, which measures the number of people experiencing severe food insecurity, more than 769 million people are food insecure globally, an increase of 103 million people from 2016 to 2017. The highest number of people who are severely food insecure live in Africa (374 million), followed by Asia (311 million). There are 22.2 million people who are food insecure in Central America, followed by another 36.7 in South America. Even in high-income countries in North America and Europe, there are 15.2 million people who were severely food secure in 2017 (FAO, 2018).

Furthermore, food insecurity is a serious condition that affects individuals physically and mentally. Food insecurity is more than hunger. Households can be considered food secure when their "physical and economic access to sufficient and nutritious food meets their dietary needs and food preferences for an active and healthy life" (Shackleton et al., 2009:57). In addition, those who live in food-insecure households are most likely to purchase unhealthy food. Children in food insecure households are prone to stunting and tend to have low cognitive development as well (Altman et al., 2009).

2.3.1. State of food security in South Africa

Food insecurity is a major challenge in South Africa (Crush et al., 2011). It is no longer seen as the failure of food production but rather a livelihood failure. According to the Food and Agriculture Organization (FAO), a situation food security exists when "all people, all the times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active healthy life" (Smith and Ratta, 1996: 35-37). The South African Constitution guarantees all South African's the right to sufficient food, stating, "every citizen has the right to access of sufficient food and water" (Fukuda-Parr and Taylor, 2016:3). Despite this constitutional right, most South Africans are vulnerable to food insecurity. For instance, 70% of South African households in settlements are food insecure (Naicker et al., 2015). Similarly, a study conducted by Rudolph et al., (2012) found that in Johannesburg, 56% of households surveyed were food insecure and 60% of the households lived in informal settlements were food insecure. The impact of gender disparity on food security is worth mentioning: 57% of female-headed households are categorized as poor and vulnerable whilst only 36% of male-headed households live within the same situation (Battersby, 2012). Similarly, 26% of South Africans experience hunger nationwide and 28% are at risk of hunger (Shisana et al., 2014). Considering these figures, the conditions of these people are more likely to perpetuate poverty and increase the level of food insecurity in the country. With a 27.2%of unemployment rate in the country (StatsSA, 2018), poverty and food insecurity is expected to persist because food correlates with income insignificant percentage (Woolard and Klaasen, 2005).

Furthermore, South Africa has one of the highest rates of income inequality in the world (Altman et al., 2009). Among middle-income countries, South Africa also has the highest level of poverty comparing to its counterparts (Temple & Steyn, 2011). To safeguard the wellbeing of South Africans, the country committed reducing poverty by 50% between 2004 and 2014. To accomplish this, in 2002, the South African government created an Integrated

Food Security Strategy (IFSS), which sought to eradicate hunger and nutrition within low-income households, but did not develop a well-defined set of food security targets (Jacobs, 2009). Generally, policymakers assume that increasing job opportunities will expand household incomes, thereby decreasing poverty and food insecurity. However, after the end of apartheid, employment increased in South Africa but never addressed income poverty adequately (Hendriks, 2014). Bongiwa, and Obi (n.d) states that food security is highly dependent on the income and asset status of households. Low-income households are more likely to suffer food insecurity because food expenditure comprises the majority of their income. Moreover, despite the political and economic changes in South Africa after 1994, the country is still associated with high rates of poverty and unemployment. Moreover, following the global economic crisis of 2008/9 fuel prices, high-energy tariffs and interest rates increased (Shisana et al., 2014). These conditions have put pressure on ordinary South Africans to meet their basic household needs.

In South Africa, there have been nutrition programmes (South Africa's National School Nutrition Programme (NSNP), Integrated Nutrition Programme (INP) and policies framed to educate people about techniques to eat nutritious food. However, lack of "accessibility, storage, refrigeration and available cooking technology all impact on household's ability to purchase and consume healthy foods" (Frayne et al., 2009:11). Moreover, 60% - 80% of poor households in South Africa spend their income on essential food but constantly increasing food prices impose poor nutritional choices in that the poor purchase cheaper calorie dense but nutritionally poor foods (Haysom 2011).

2.3.2. Food security in Cape Town

Cape Town is the second largest city in South Africa with a population of 4 232 276 (CCT, 2017). Cape Town has huge challenges, including poverty, unemployment, and housing which are the legacy of apartheid. In 2013, a survey found 58% of people in Cape Town as a whole were moderately or severely food insecure (Battersby, 2016). Similarly, 75% of the households in the low-income area were food insecure, with 58% falling into the severe food insecure category (Battersby et al., 2014).

Additionally, 80% of poor households in Cape Town neighborhoods of Khayelitsha, Philippi, and Ocean View were either moderately or severely food insecure in 2008 (Battersby et al., 2014). In Manenberg, 64% of households surveyed were food insecure (Haysom, 2017). Only 18% of low-income households are food secure compared to 74% and 94% of middle income

and high-income households, respectively (Battersby, 2011). The link between poverty and food insecurity has been documented in rural areas, especially in the Eastern Cape where mostly Cape Town urban poor migrate from. However, due to the variance of living conditions within the city poor households capitalize on the potential of UA and use it as a means to survive (Battersby, 2016).

Furthermore, the City of Cape Town believes that UA can contribute to the reduction of poverty and improve household food security (CCT, 2013). The contribution of urban agriculture on the local market is low, with only 5% of households in Cape Town practicing urban food production (Crush et al., 2011). The underachievement of UA is due to lack of access to land, low fertility soils, lack of knowledge of urban agriculture and so forth. However, UA is gaining much recognition where NGOs like Abalimi, Foodpods, and Love2Give see UA as a way to alleviate poverty and build a sustainable and less hunger society (Grundlingh, 2013).

Moreover, considering the current state of food security in South Africa, urban food security could also offer solutions to many social ills such as hunger, environmental problems, and poverty. In South Africa where policymakers declared that the country is food secure, the matter is not the availability of food, rather it is the accessibility of food. There are two ways to access food in urban areas: to buy from the supermarkets or to grow it at home. However, access to land is a big challenge for the urban poor in South Africa. These people remain food insecure because some of the urban poor in South Africa migrated from other area and arrive in Cape Town with very little skills and education, all of which limits their survival options.

In Cape Town, food insecurity is not a lack of food availability, rather, it is a household's low income that limits their ability to buy nutritious foods (Battersby, 2016). Poor urban households in Cape Town suffer a scenario where they have to skip meals or have limited food. In a context of low income and high unemployment, urban agriculture can improve the diet of the community and provide fresh and nutritious food to create healthier communities. Although there is enough food in cities not everyone benefits from the availability of the food as a large number of the poor urban residents struggle to feed their families on a daily basis (Van Vuuren, 2016). Urban households spend the majority of their income on food, which restricts their power to invest in their health and on the education of their children.

2.3.3. Food security in the Stellenbosch municipality

In Stellenbosch, 28% of the population, primarily those in African and Coloured neighborhoods, are food insecure (Haysom, 2011). There are diverse challenges that face the municipality and normally include food insecurity and unhealthy diets (SM, 2015). The state of food security in Stellenbosch is hard to measure due to the lack of accurate data, which can provide information about the nature of food and nutrition security (SM, 2012). However, there is an Integrated Development Plan (IDP), which adds food insecurity as one of the challenges to solve in Stellenbosch but it failed to improve the food security to include its strategic objectives. The plan lacks clear performance indicators for food security. The Stellenbosch municipality has transformed itself in recent years. There has been rapid growth through the expansion of university accommodation into suburbs, new malls and more traffic congestion, which indicate the economic growth of the municipality. The growth, expansion and, innovation have developed through the spatial layout, ecology and unique environment of Stellenbosch. The Stellenbosch municipality aims to become the "innovative capital" of South Africa (SM, 2014). However, the municipality also faces many challenges including poverty, unemployment, food insecurity and, high population increase. These are challenges for policymakers to find a sustainable solution.

Moreover, the IDP is aligned to the national theme of "ensuring vibrant, equitable and sustainable rural communities with food security for all" (Van Vuuren, 2016:100), which translates at the municipal level to "create an environment and forge partnership that ensures the health, safety, social and economic development of all communities including the empowerment of the poor in the Cape Winelands District" (Stellenbosch Municipality, 2014:50). However, having a food secure community is determined by the availability, accessibility and, utilization of food (Kelly and Schulschenk, 2011). Informal dwellers face more challenges to become food secure because of the lack of unemployment and a lack of income. Those who live in informal settlements also face a lack of electricity, water, and proper sanitation. This forces poor households to buy very small quantities of food which tends to cost more. Additionally, the current food system in Stellenbosch perpetuates food insecurity in the region because the area relies more on food imports rather than producing locally (Van Vuuren, 2016). Surprisingly, 70% of food consumed in the Stellenbosch area is bought from supermarkets or retail shops (Haysom, 2010). Importing food costs more since Stellenbosch is connected to the globalised agricultural system. Swilling and Annecke (2012) argue the increase of oil prices will influence the food prices through transportation patterns.

The "3rd Generation" 2012-17 Integrated Development Plan proposed measures to address food insecurity in Stellenbosch by allocating 10 000 ha of land within the municipality area for local food production (SM, 2014). It has been proposed through land reform programmes (SM, 2014). However, it is not clear how the land transfer will be done and to what extent it will ensure food security. Additionally, the IDP document also does not clarify how urban insecurity within low-income households will be solved without a proper plan and programmes (Van Vuuren, 2016). Although the municipality does not provide clear guidance on food security, there are some initiatives going on in the municipality to increase food security such Idas Valley communal vegetable gardens, Raithby and Vlottenburg backyard food gardens (SM, 2014).

2.9. Chapter summary

This chapter covered the literature review on UA and food security. It discussed these concepts by comparing the existing findings of the world, South Africa, Cape Town and, Stellenbosch. The chapter examined the link between UA and food security, and the motivations behind the practice of UA. Finally, the chapter also discussed the state of food security in the world, South Africa, and Stellenbosch. The following chapter will emphasize the theoretical framework underpinning this research.

CHAPTER THREE: THEORETICAL AND CONCEPTUAL FRAMEWORK

3.0 Introduction

The Sustainable Livelihoods Approach (SLA) is a tool used for development work, it describes the main factors that affect the livelihoods of the poor (Petersen and Pedersen, 2010). It is a holistic approach that focuses across a range of individuals, reflecting diversity in the livelihoods of poor people. The people in Kayamandi face a multitude of social problems such as poverty, food insecurity, and unemployment. Therefore, the SLA suits this study in sense that it offers solutions to the root causes of these social problems. The SLA seeks to limit the vulnerability within poor households and gives room for UA to become a tool to build a sustainable livelihood. This study will apply SLA due to its holistic approach to poverty alleviation. The literature indicated that UA has a positive impact on the livelihoods of the poor by providing valuable assets such as income, food, employment, and physical well-being (Kébé and Muir, 2008). Therefore, recognizing UA as an alternative to reduce vulnerability will be a valuable asset for the poor to make a living in a sustainable way. The chapter consists of four sections; the first section will describe what SLA means and what it used for while the second part of the chapter will discuss how the sustainable livelihoods framework tackles vulnerability and builds a sustainable community. Thirdly, it will highlight the applicability of the SLA regarding this study, and finally, the chapter will conclude the shortcomings of the theory.

3.1. The Sustainable Livelihoods Approach

The Sustainable Livelihoods Approach (SLA) proposes a logical and coherent framework for poverty reduction. The idea emerged at the Brundtland Commission on Environment and Development as a method for connecting socio-economic and ecological reflections in a cohesive, policy-relevant organization (Morse et al., 2009). The primary focus of the SLA was on rural areas, especially to empower rural farmers who lack the skills to build assets. The SLA is composed of three categories. First, it acknowledges that economic growth is an essential means to fight poverty, but it does not necessarily mean it will reduce poverty since it also depends on the capabilities of the poor. Therefore, any intervention that seeks to better the lives of the poor must be done through empowering and building people's capabilities so they can build their assets. Secondly, the SLA argues that the poor have realised that poverty is not only due to having low income, but there are also other dimensions that determine

poverty such as illiteracy, bad health, and lack of social services etc. The persistence of these problems is likely to perpetuate poverty and create vulnerability. Thirdly, the SLA notes the role of the poor people; their voice has to be heard and they should be the core of the policy design and projects that intend to improve their lives (Morse and McNamara, 2013).

Furthermore, the term SLA has been in defined in the literature. According to Chambers and Conway (1992:296) the SLA:

> *[E]ncompasses the capabilities, assets including both material and social resources and activities required for means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long-term (Chambers and Conway, 1992:296).*

The definition is based on the factors which poor people can build on to achieve a livelihoods outcome. These factors include important assets such as food stocks, store value, and cash saving. These are tangible assets and resources (e.g. land, water, trees, livestock etc.) as well as intangible assets such as claims (demands and appeals), which can be made for material, and moral support. Additionally, Morse et al., (2009) also define the SLA as a process of capacity building by enhancing the capabilities and assets of the poor in order to avoid shocks and stresses. This stresses the importance of asset building and how communities shape their future. Capitals such as social capital, financial capital, physical capital, human capital and natural capital can play an important role in building a sustainable future for poor people. These capitals can be destroyed by shocks and disasters (e.g. physical infrastructure can be destroyed by floods and earthquakes). Therefore, the SLA advocates for a people-centered approach where people shape their destiny.

Additionally, since the assets can be destroyed by shocks and disasters, the SLA delivers ways in which poor people can manage their vulnerability challenges (Kébé and Muir, 2008). It encourages poor communities to build resilient methods, which support their livelihood systems so that they can respond to shocks such as the sudden loss of a breadwinner or losing a crop through fire etc. Therefore, building resilient communities decreases vulnerability and reduces poverty. The approach does not claim to be the only solution for poverty reduction; however, it argues that it can provide a valuable mechanism for the sustainability of the livelihoods of the poor (Brocklesby and Fisher, 2003). It also promotes a way to increase the

identification, implementation and, evaluation of the developmental projects. It improves and addresses the priorities of poor people at the grassroots level and at the policy level.

According to the literature, urban agriculture has been practiced for generations in Africa and the rest of the world. Throughout the globe, both low income and middle-income households practice UA in varying degrees with different reasons and strategies. In recent times, urban decision-makers recognized UA as a livelihood strategy. Using asset-building mechanisms, urban households engage strategies that better their living conditions such as informal trading, self-employment, agricultural production (within and outside cities), and pursuing education to escape poverty (Petzer, 2015). These strategies will make it easier for the urban poor to reach livelihood outcomes such as improved food and nutrition security and saving income to use for other sectors (see Figure 3.1).

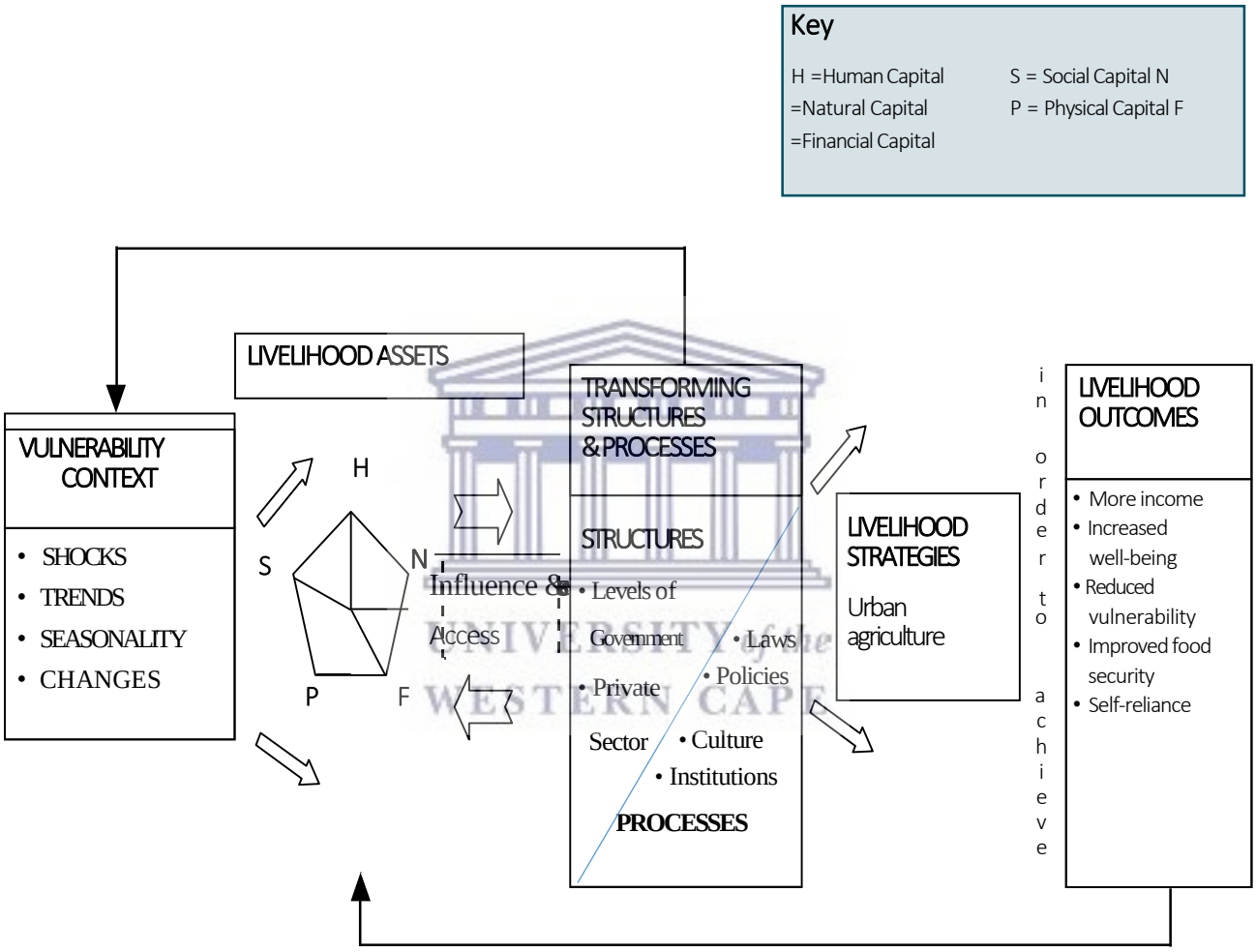
3.2. Sustainable Livelihoods Framework (SLF)

The SLF proposes a valuable conceptual base for understanding the plight of people living in poverty in urban areas. It can be applied to analyse the livelihood strategies used by the communities to respond to external shocks and stresses such as floods and droughts (Tinsley, 2003). The term SLF discusses and clarifies three aspects within the framework. Firstly, it answers the question of what is a livelihood. Secondly, it explains the term sustainable, and finally, it gives guidelines about how to operationalize the term sustainable livelihoods approach. In earlier stages, the term livelihood had a narrow definition relating to the flows of income (Olivier, 2015). In this case, income increase results in poverty reduction. For instance, a livelihood is defined as "adequate stocks and flows of food and cash to meet basic needs" (Chambers, 1988 cited by Attfield et al., 2004:406). While income is a very important aspect for the betterment of human living conditions, it remains one component of a livelihood, and not a livelihood itself. Additionally, a livelihood is not merely income rather it is building capitals and capabilities.

Moreover, the term sustainable needs to be defined in order to be understood what to sustain. Addressing poverty alleviation means one has to understand that poverty alleviation is related to resilience in the long term not to the livelihoods themselves (Rakodi, 2014). Nonetheless, sustainability is related to environmental and social abilities, which are not necessarily compatible. The concept has two dimensions, namely, a negative and a positive dimension. The negative dimension is reactive which defines sustainable livelihoods as the "the ability of livelihood to be able to cope with and recover from stresses and shocks" (Chikadzi and

Munatswa, 2014:598). On the other hand, the second dimension is proactive which also defines sustainable livelihood as "enhancing and exercising capabilities in adapting to, exploiting and creating change, and in assuring continuity" (Chikadzi and Munatswa, 2014:598). These come after the realization that poor households lack coping mechanisms. Therefore, sustainable livelihood definitions integrate both dimensions while not forgetting the balance of social and environmental sustainability.

Figure 3. 1. Sustainable Livelihoods Framework



Source: Department for International Development (DFID, 2000)

As Figure 3.1 indicates, SLF consists of components that lead to livelihood outcomes. The components start with the vulnerability context, a situation that frames the external environment in which people live. It is a context in which people have limited or no control (Serrat, 2017). In the vulnerability context, people lack the capacity to face harmful threats or shocks. The second component is the livelihood assets which are needed to be built in order for the poor to reach livelihood outcomes. The assets that need to be built are the sustainable livelihood capitals which the next section will discuss. Thirdly, the transforming structure and

process is another component which consists of the institution, organisations and, policies that enable the community to create livelihood assets. These structures and policies enable the poor to use their assets in a sustainable way. And the fourth component is the strategy people use to survive. Finally, livelihood outcomes will be reached after all these stages; it is where people enjoy their achievements (Petersen and Pedersen, 2010).

3.2.1. Sustainable Livelihoods Capitals (SLF)

There are five capitals in the sustainable livelihood framework. These capitals are social capital, natural capital, human capital, physical capital and financial capital (Olivier, 2015). The term "capital" is widely used in economic terms, however, the SLF formulates a set of building blocks of capitals which contributes to the livelihoods of the poor (Tibesigwa et al., 2016). Therefore, capitals in SLF are not only economically beneficial but also create meaning and agency. Serrat (2017) suggest that livelihood capitals directly relate to vulnerable people who are economically excluded. These vulnerable people lack financial capital, which might force them to substitute their financial capital with access to land. Hence, food is accessible from the land, rather than through financial transactions. It is not always easy to substitute capitals, nonetheless, a shortage of capitals might impact on accessing to other capitals. For instance, financial capital is dependent on human capital. The more education the individual has the more job opportunities available. Thus, low levels of education have negative influences on gaining financial capital (Olivier, 2015).

Social capital

The term social capital can be defined as the "features of social organization, such as trust, norms and, networks that can improve the efficiency of society by facilitating coordinated actions" (Olivier, 2015:81). Social capital contributes to social cohesion in terms of building the well-being of individuals and creates thriving communities. This is a significant factor for creating sustainable livelihoods, because "the social networks of the poor are one of the primary resources they have for managing risk and vulnerability" (Woolcock & Narayan, 2000:242). Additionally, there are similarities between social capital and other capitals such as physical capital and financial capital. For instance, individuals with greater social capital often have increased capabilities and have a greater chance to have access to other capitals. Due to networking and connections, individuals with greater social capital tend to reduce

their vulnerability. Therefore, social capital increases financial capital through saving (Rakodi, 2014).

Furthermore, social capital has a positive influence on enhancing human capital (Olivier, 2015). For example, when there is very strong social capital within the community, it creates an environment where kids can grow and go to school safely. Social capital creates trust and reciprocity between individuals. Thus, it impacts the future of subsequent generations. This is one core component of sustainable livelihood approaches. Moreover, social capital is associated with social satisfactions such as happiness and contentment in individuals. For instance, research was done by Gallaher et al., (2013) in Kenya found that cultivators that interact more frequently have greater levels of trust than those who do not cultivate. The cultivators indicated that through farming they developed greater trust and bonding. Therefore, social capital strengthens existing social relations through urban gardening.

Natural capital

Protecting the environment is an important part of the SLF. Natural capital includes water, air, soil and genetic resources (Attfield et al., 2004). One of the reasons the SLA focuses on the environment is that it plays a significant role in human survival and is a great wealth of resources for humans. Over exploiting may generate short-term benefits, but will have a lasting impact on the next generations (Tinsley, 2003). The SLA, therefore, emphasizes the protection of natural capitals. Regarding the relationship between natural capital and urban gardening is that urban gardeners consistently engage with the environment which familiarizes them with natural beings. Through community gardens, these people produce food to use at the household level. In Cape Town, the natural capital that is available for urban cultivators includes the arable land and the Cape Flats aquifer (Jacobs, 2009). Although these natural capitals are available, the gardeners cannot access these without the help of NGOs. For instance, the majority of urban poor in South African, especially those who live townships, have very small dwellings with no space to farm. Therefore, organizations such as Love2Give, Abalimi and, Soil for Life offer community gardens where people can farm for free.

Human capital

Human capital is the *"*skills, talents, leadership capacity and charisma possessed by members of a community" (Nel et al., 2001:4 cited in Olivier, 2015). Lack of human capital hinders the overall development process of the world, as human capital influences other capitals. For

example, poor health and low educational levels have a direct influence on financial capital by limiting the chance to earn income. Therefore, sustainable livelihoods would not be successful without developed human capital. In addition, the lack of human capital may affect the level of productivity of gardens because those who engage in urban gardening have limited skills and education. In this regard, human capital increases the knowledge and the experience of urban gardeners (Tinsley, 2003). Foeken and Owuor (2008) suggest that urban gardeners in Kenya plant only the crops that suite their needs. This indicates that farmers have the skills and knowledge about the crops that are available and are unlikely to plant unwanted crops.

Furthermore, Cape Town's poor urban areas encounter limited vacant land, therefore, the urban farmers know how to use the available spaces efficiently (Crush et al., 2011). Additionally, cultivators may have some agricultural knowledge from their heritage, however, in urban farming, it is a completely different environment. Thus, without proper human capital, urban cultivators are likely not to benefit the free urban spaces.

Physical capital

The elements of physical capital include public infrastructure and private property (Morse and McNamara, 2013). Public infrastructure includes water, sanitation, affordable transport and access to information (Olivier, 2015). While private property includes housing, tools and, equipment. These are the elements that are central to sustainable livelihoods. For urban gardeners, public infrastructure, energy and, housing are basics to sustain their lives (Tibesigwa et al., 2016). Although good infrastructure improves the lives of the urban poor, it comes with negative consequences such as removal and relocation of poor people to the outskirts of the cities. Similarly, housing improves the situations of the poor not only for protection but also for generating income through renting or practicing gardening in the backyard.

Moreover, insufficient physical capital can cost urban gardeners. For example, farmers in the Eastern Cape in South Africa, generate small incomes from their products or sell below unit price because of lack of proper infrastructure. Additionally, in Kenya, lack of water affected the crops of urban cultivators due to successive droughts. Therefore, physical capital immensely contributes to the lives of urban gardeners (Olivier, 2015).

Financial capital

Financial capital relates to the accessibility of cash or commodities that may be exchanged (Petersen and Pedersen, 2010). Money is an important element for any community to survive. There are two key categories in finance capital: stocks and inflows of money. Stocks refer to the assets such as livestock and jewelry, while inflows of money are the salaries, social grants or remittances (Petersen and Pedersen, 2010). In cities, the lack of access to money may exclude the urban poor from buying food since urban life is expensive. Consequently, having employment contributes to the financial capital of low-income urban households (Olivier, 2015). However, due to the low human capital in poor areas, only one source of income might be inadequate for households to survive. This forces the urban poor to engage in informal jobs such as street vending or engaging in urban gardening, to reduce their food insecurity.

In Cape Town, urban gardeners face the same problem. According to Jacobs (2009), urban households receive their income from both formal and informal employment; some also receive their income from their own production. The alternatives for income include family support and donors. Moreover, Olivier, (2015) indicates that due to lack of affordability, urban gardeners reuse seeds from previous yields. This shows what role limited financial capitals play in the lives of poor and vulnerable households.

3.3. SLA context

The SLF indicated the types of capitals that may be available for the urban poor to benefit from. Sustainable livelihoods cannot be achieved without proper planning in order for poor people to access capitals (Tibesigwa et al., 2016). A community can be considered successful when it's able to access the capital stocks that are available to them. Nevertheless, there could be other factors that could limit the community access to the capitals. These include political, social and environmental factors. According to Sen (2005), these factors are called conversion factors. In his capability approach, Sen explained further that "the freedom to have something is more important than actually having it" (Sen, 2005:155). Sen stressed that being unable to access healthy food is an issue of justice while choosing to eat unhealthy food indicates freedom of choice. In this regard, residents in Cape Town are unable to access nutritious food, enjoy public spaces and have limited ways to interact with the community.

Furthermore, there are numerous NGOs such as Love2Give, Abalimi and, Soil for Life who are part of the institutional context. These NGOs play an important role in promoting UA and

alleviating all the obstacles that limit the poor from accessing the available capitals. Therefore, sustainable livelihoods are affected by both the vulnerability context that affects the quality and availability of the capital as well as the institutional context, which affect the accessibility of capitals.

3.3.1. Vulnerability context

The vulnerability context is the resilience of livelihoods in which it persists or forms a change for the poor people. A vulnerability has two dimensions: the external dimension, which is beyond the control of an individual where it destroys his or her livelihood capitals, and internal dimension, which speaks to the ability of livelihoods to fight these influences (Olivier, 2015). Livelihoods can only resist shocks and stress when they are diverse. In low-income countries, the urban poor use diverse income sources, including engaging in urban gardening to diversify their livelihoods, which eventually builds their resilience.

The main threats that come in the form of stress and shocks can be described as external dimensions. Stress occurs over long term and is normally predictable. In spite of being predictable, stress can be distressing if nothing can be done to mitigate it. For instance, Morse and McNamara (2013) state that when Africa experienced declining demands for labor associated with economic slumps, the urban poor may have the ability to recognise the joblessness but the inability of the market to provide opportunities, so they are powerless to solve the problem of the declining market due to their vulnerability and lack of power. Additionally, stresses could be growing because the negative influence of the stress may destroy the resilience of their livelihood. In contrast, shocks occur unexpectedly and can destroy all livelihood capitals in one go.

Furthermore, unlike stress, shocks occur unexpectedly. In the agricultural perspective, shocks such as drought and flooding occur more often. In rural South Africa, Nel et al., (2001) indicate that a community development project was almost swept away when a year of flooding was followed by a year of drought. However, in an urban area, shocks are based on human-made incidents. For example, shocks that occur in an urban area are mostly pollution, theft or fire (Rutherford et al., 2002). Shocks like fire can have a devastating impact for destroying the physical capital. Moreover, the familiar shocks that occur in African cities include the official harassment of micro-enterprise traders or damage to their physical capitals (Olivier, 2015). Vulnerable individuals have very little power to mitigate the coming

stress and chocks. Therefore, there should be an institutional context to support long-term sustainable livelihoods.

3.3.2. Institutional context

Forming a transformative environment, structures and process can pave the way to sustainable livelihoods, which may result in a community with improved livelihood strategies and outcomes (Krantz, 2001). These structures consist of public and private sectors that determine and implement policy and legislation. They also deliver services and execute all the functions that impact the livelihoods of the poor. Additionally, processes provide the laws, regulations, policies operational arrangements, societal norms and the frameworks in which the structures operate (Olivier, 2015). Processes provide encouragement that inspires people to make a better choice. Therefore, the structures cannot be effective without appropriate institutions and process, therefore, cannot influence the livelihoods.

Furthermore, the role institutions and policies play cannot be ignored. They impact the lives of the poor whether it is at the household level or international level. These policies and institutions directly define how vulnerable people access capitals, make livelihood strategies and make decisions (Serrat, 2017). These institutions create choices and increase livelihood strategies, which at the end improve the scope of the sustainable livelihood outcomes. They also evaluate whether the urban poor has achieved a sense of inclusion and well-being (DFID, 2000). Moreover, the approach offers a clear guideline regarding vulnerability and sustainability. It also indicates that the situations that poor people live in are complex and unique therefore, every problem requires its own context analysis (Gallaher et al, 2013). In this regard, SLA puts people at the center the debate by taking into consideration their knowledge, perceptions, and interests which creates a bottom-up approach.

Regarding the urban gardening context, institutions facilitate cultivators to access land and provide farm inputs as well as collect and process on behalf of famers. In this case, government plays a big role in providing the poor with access to land at a low cost. For instance, in the Eastern Cape, the government provided small-scale agriculture with ten year leases on arable land which eventually contributed significantly to food security (Nel, 2015). Similarly, in 2007, the City of Cape Town introduced its first ever UA policy, which legitimises the promotion of UA in the city (CCT, 2007). The city believes that UA can reduce food insecurity. Although government plays a big part in contributing to the promotion of UA, NGOs are the main players in the promotion of UA in South Africa. NGOs

are “able to deliver higher-quality services than government to the very poorest sectors of society, while remaining cost-effective and efficient” (Mercer, 1999:247; cited in Olivier, 2015:92). In relation to this, NGOs builds a strong community through bottom up development approach.

3.4. Livelihood strategies

Livelihood strategy is mixture of assets and activities that are important to achieve livelihood goals (DFID, 2000). The main aim of livelihood strategies is to achieve livelihood outcomes. Poor people have a vast number of livelihood strategies which could be natural resources based activities, non-natural resources based activities, migration, grants, remittances, pensions, agricultural intensification and, diversification. According to Scoones (2009) migration, agricultural intensification and livelihood diversification are the three main livelihood strategies poor people adopt. Scoones and DFID (2009; 2000) further stressed a successful livelihood strategy should have a starting point. First, the interchangeability of capital assets, meaning that the poor can substitute one capital for another. Secondly, the asset source of the poor? Does the household derive its assets from one livelihood strategy or not. And finally, whether there were trade-offs faced by the people pursuing different livelihood strategies. In relation to this, urban gardening cannot be the sole livelihood strategy, but it can play a significant role to reduce the food insecurity of households.

3.5. SL outcomes

The livelihood outcomes are the results of people’s successes and failures in changing, through the strategies and assets available for their survival (Morse and McNamara, 2013). According to Kappel et al., (2010), “livelihood outcomes are the achievements of people’s livelihood strategies” (cited by Olivier, 2015). Usually, livelihood outcomes include more income, increased well-being, reduced vulnerability, improved food security, more sustainable use of natural resources, and recovered human dignity. Livelihood outcomes can be measured by the range between vulnerability and security (Rakodi, 2014). Thus, livelihood strategies of a household is their ability to predict shocks and stresses, which can destroy their assets (Gallaher, 2013). For example, a family that depends on one single livelihood strategy such as the employment of a family member is more likely to be vulnerable to shocks and stress (Jacobs, 2009). If the member of the household who is employed face some challenges such as dismissal or sickness, it is likely that the household

will suffer food insecurity. Therefore, livelihood outcomes are key for strengthening the capitals and assets bases of poor households.

3.6. Applicability of SLA

SLA is a people-centered approach that puts people at the center of development. It's a method which policymakers and researchers use to understand the situation of vulnerable people (Olivier, 2015). SLA is a fundamental tool for development used by national and international organizations to analyse the issues that affect the livelihoods of vulnerable groups (DFID, 2000). The SLA is based on alternatives that focus on ways to create sustainable livelihoods for the poor. SLA value people's engagement, which means people's participation is the key to implement this analytical framework. Understanding what poor people want, asking what their priorities are and acknowledging the cultural differences will help determine how they understand and appreciate livelihoods. Additionally, since poor people know what aspects matter to them, development practitioners should remain facilitators and value the inputs of the poor (Petersen and Pedersen, 2010). The aim is to build a relationship based on participation and partnership between the poor and donors or development practitioners. In this process, the poor people will be empowered and do things themselves instead of depending on external help.

Serrat (2008) argues that SLA is a holistic framework that allows the poor to understand their difficulties and the vulnerabilities they encounter. The holistic nature of SLA has the ability to identify the multiple actors that play an important role in the improvement of the lives of vulnerable people, whether they are private or public sector (Tinsley, 2003). In addition, the tool highlights the capacity of the individuals and households to understand the livelihood system. This makes it easy for the policymakers to identify which intervention can contribute to the sustainability of their livelihoods. It also evaluates the effectiveness and efficiency of the policies implemented (Tibesigwa et al., 2016). Through the successful application of the SLA, the vulnerability of poor urban households will be reduced, more income will be generated, resulting in greater asset bases and improved health as an outcome.

3.7. Critique of the SLA

Although the SLA offers a clear path for poverty alleviation, it encounters some critics (Scoones, 2009). One of the main criticisms is that it argues that it is a people-centered approach, but surprisingly the word people is not visible in Figure 3.1 above (Olivier, 2015). It means that the approach focuses more on institutions and policies rather than the people.

Additionally, SLA has little consideration about culture, which is very important in understanding communities (Tao et al., 2010). The lack of understanding of how culture influences the lives of the poor may hinder the work of development practitioners. Moreover, Clack and Carney (2008) argue that the sustainable approach lacks in-depth analysis and is too broad and too shallow. Similarly, the SLA is not a realistic and integrated theory of development (McNamara et al., 2013; Small, 2007).

Furthermore, since livelihoods are about living well, the living should be more than inquiring about assets and earnings (Sen, 2000). This means poor people must be able to understand the environment surrounding them. If possible, they should be able to contest the rules and regulations that affect their lives. In addition, the approach is more like a corrective tool than introducing a transformative system. It allows poor people to access markets and credit but fails to empower them in terms of further participation (Clack and Carney 2008).

Furthermore, the SLA ignores gender and power relations. Snidder (2012) argues that inequality in power relations often reveals men are in power in most of the poor households. Although the SLF addresses the vulnerability, it has been accused of collecting data that gives less attention to women's needs (Toa and Wall, 2009). This means that in principle the theory takes into consideration the gender issues, but fails at the implementation process. For example, when conducting participatory research, women are more likely to have little time to attend meetings and contribute less to the decision making process.

3.8. Summary

To conclude, this chapter discussed the principles and guidelines of SLA to this study. The chapter highlighted the importance of SLF and how it suited the overall research. It also demonstrates the role of capitals in forming a successful community. Additionally, it discussed the vulnerability context and how the approach tackles the shocks and stresses communities encounter. It also acknowledged the role of institutions and policies which lead to sustainable outcomes. In addition, the chapter stated the applicability of the approach and the suitability to this study. Finally, the chapter gathered some of the critiques of the theory by indicating the shortcomings of it. The following chapter focuses on the study's research methodology.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.0. Introduction

This chapter describes the research methodology used in the study. It gives the details of the studied population, the sampling criteria, and the rationale behind the sampling. It demonstrates the research instrument used for data collection. The chapter also covers the data analysis and presentation techniques used in this study. Finally, the chapter outlines the ethical considerations followed by a chapter summary.

4.1. Research design

The research design is a methodological plan to scientifically study a problem. The research design outlines the research type and sub-types such as hypothesis, research question/s as well as independent and dependent variables. Leech and Onwuegbuzie (2009:166) state that research design is a process of choosing subjects, research sites, and data collection procedures to answer the research question/s. Similarly, Creswell (2009:22) defines "research designs as the plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis". Consequently, the aim of the research design is to add new findings to the existing literature by conducting an evidence-based study. Also, the process encompasses assumptions, principles and, procedures that allow the researcher to follow in order to reach a final conclusion. Based on this, the researcher chose the following research design to critically study and analyse the collected data to reflect the reality of the participants.

4.2. Research methodology

Research methodology is defined as a way to scientifically solve the research problem (Kothari, 2004). It may be described as the science of studying how research is done systematically. Research methodology processes clarify and define the kinds of problems that are worth researching and whether there is a testable hypothesis. It aims to formulate a frame that simplifies the ways to investigate a problem, through particular designs and procedures and to develop a suitable way to generate data (Babbie Mouton, 2001). Subsequently, there are three methodological categories that can be applied to conduct research (quantitative, qualitative and mixed method research methodologies). Although social researchers legitimize both quantitative and qualitative methods, this study is used mainly qualitative research in order to holistically understand the human experience in specific settings.

However, a bit of quantitative data will be deployed to strength the qualitative results.

4.2.1. Qualitative research methodology

The qualitative research methodology is based on a process of examination to understand a social or human problem from different perspectives. It is a method that studies human behaviours or investigates why people think or do certain things (Trotter, 2012). The intention of qualitative research is to discover the underlying motives and desires, applying in-depth interviews for the purpose. Qualitative research can be defined as "the process of interpretation of phenomenon in their natural settings to make sense in terms of the meanings people bring to these settings" (Arghode, 2012:105). This allows the qualitative researcher to easily capture a holistic picture of the issues at interest and discover the changing nature of lived social realities. This type of research method uses qualitative data gathered through interviews, documents and, observations, in order to draw a conclusion and explain a social phenomenon. Furthermore, qualitative research arose from social science to allow researchers to study social and cultural oriented situations. The benefit of the qualitative approach is that it is more contextual and gives more in-depth information about the studied area (Blanche et al., 2014). However, the limitations of qualitative research design are that the information gathered cannot be applied in the wider population with the same degree of confidence that quantitative analysis can (Atieno, 2009). The reason is due to that the findings are not tested to discover whether they are statistically significant or not.

4.3. Methods of data collection

4.3.1. Sampling methods

Sampling is a technique that refers to the "selection of individuals, units, and/or settings to be studied" (Nastasi, n.d:2). Both qualitative and quantitative have their own methods of sampling. There are various techniques to sample size the study group (e.g. homogeneous sampling, snowball sampling, purposeful sampling, critical case sampling etc.). According to Babbie (2001:164), "Sampling is a process of selecting observations". In this regard, there are two main techniques for sampling, probability sampling and, non-probability sampling. Probability sampling is a process where each person in the studied area has an equal opportunity of being chosen. Probability sampling is more used in the quantitative method because it selects a large population in a random way. While the non-probability sampling is based on a small sample size whereby the researcher chooses purposely.

This method is presentative and much less complicated and less expensive (Babbie and Mounton, 2001). It can be done at any time by taking advantage of whoever is available. Qualitative research often applies purposeful or criterion-based sampling, the study group is purposively selected based on their characteristics relevant to the organisation benefit (Babbie and Mounton, 2001). Therefore, for the purpose of this research, non-probability (qualitative) was used. For example, researcher, purposely selected 12 beneficiaries from the Love2Give organization. The purposeful sampling was employed based on the research questions and objectives. A total of 12 interviews were conducted, 10 people were the beneficiaries of Love2Give plus the manager of the project and one member of the Stellenbosch municipality. Due to time constraints and language barriers, the focus group discussions were not possible

4.3.1.1. Semi-structured interviews

Interviews give room for interaction between the researcher and respondents. Interviews "give us an opportunity to get to know people quite confidentially, so that we can really understand how they think and feel" (Blanche et al., 2014). Qualitative interviews can be like our daily conversation but as a researcher, it can also contribute immense data. In this regard, the role of the researcher is to create an environment that's open where the interviewee feels comfortable and friendly. Moreover, Babbie and Mouton (2001:289) see "interviews as a flexible, interactive, and continuous, rather than prepared in advance and locked in stone".

It's an investigative process through discussion and free-flowing conversation with the studied subject. Therefore, in order to critically evaluate the impact of UA on food security in the case of urban food gardens in the Kayamandi settlement in Stellenbosch, interviews were an integral part of the data collection process.

4.3.1.2. Questionnaires

A questionnaire is a technique to collect data in a social research design, which directly relates to survey research and is widely used in experiments and impact assessment research. According to Babbie and Mouton (2001:238), a questionnaire is a script which encloses questions and substance meant to generate suitable information for analysis. Administering questionnaires helped the researcher to capture the socio-economic structure of the area. The researcher used Stata14 software to see the correlations between socio-economic variables. The researcher also conducted 12 self-administered questionnaires in the English language with the assistance of a Xhosa-speaking person to translate. Closed-ended questionnaires

were used to generate a greater consistency of answers and are more easily processed.

4.3.1.3. Review of secondary literature

Blanche et al. (2001:316) argue that "documents such as letters, newspapers articles, official documents, and books can be useful in all forms of qualitative research". All the above mentioned helped the researcher to gain more knowledge and data. For example, local newspapers offered vast information about the area under study. Secondary documents also made it easier for the researcher to review urban policies at the provisional level and municipal level, which contributed to the research. For the sake of time and money, doing document reviews is much easier than interviews (MSF, 2002). Therefore, the researcher constantly viewed secondary literature in relation to urban agriculture and food security in Kayamandi in particular and the Stellenbosch municipality in general.

4.4. Data analysis

This study used an explanatory qualitative research method. The researcher went to the field and collected quantitative data for table generating purpose. This was followed by the collection of qualitative data. The logic behind using both methods is that the quantitative approach and its analysis offer a general understanding of the demographics of the participants while the qualitative analysis explains the statistical results through discovering the views of the study participants. The researcher preferred mainly qualitative approach for its simplicity and straightforwardness.

Furthermore, data collected through questionnaires were presented numerically. The data was coded and transferred from questionnaires to an Excel sheet. The researcher took great consideration to cross-check the data from the questionnaires to the Excel sheet in order to detect errors. The data was imported to Stata14 software for tables generating purpose. Descriptive statistics were used for every variable in order to describe the data. The tab command was repeatedly used to see the frequencies and the percentages of the participants.

4.4.2. Qualitative data analysis

The qualitative approach is one that describes and understands rather than explains human behaviour (Babbie and Mouton, 2001). It focuses on experience, themes, types, perceptions, and qualities, things that are harder to measure (Arghode, 2012). Qualitative research also places emphasis on understanding the aspects of social life through collecting words rather than numbers for data analysis (Choy, 2014). The researcher implemented a thematic

approach to analyse qualitative data. As Braun and Clarke (2006) argue there are six thematic analyses which qualitative analysers can deploy Familiarizing with data. The researcher acquainted himself with the data and started to detect codes led by research questions. The researcher also listened to the interviews and transcribed them. He imported them to open code software to identify themes and sub-themes.

Generating themes

The researcher organised themes accordingly to avoid repetition. For example, when coding anything relating to income, it would be placed under that theme.

Searching for themes

The researcher further used open code software search button to find codes and re-read it if the codes are correct manner or if there is errors or misplacement.

Reviewing themes

The researcher constantly reviewed the themes in order to see whether there were potential themes that would emerge. The researcher also considered any shortcomings regarding creating new themes.

Defining and naming

After creating multiple themes and sub-themes, the researcher had to create an umbrella theme which could represent a combination of themes and then created working definitions with regards to research objectives.

Producing the report

The final part was translating the qualitative data to interpretable information in relation to the research questions and literature. The interpreted data was used to explain the qualitative section of the study.

4.5. Ethics

Throughout the work, the researcher did not harm, ill-treat or trouble in any other way, the participants or anyone else involved in this research study. The researcher recorded the interviews and requested approval from the respondents beforehand through respondent consents. There was not any objection from the respondents and the researcher took note and made that the data is captured. Additionally, this research upholds the ethical considerations

and implemented all forms that relate to ethical issues including applying the research to be more autonomous which means the rights of participants was respected and encouraged anyone who is willing to withdraw to do so without any fear and embarrassment. The confidentiality of the participants including their names were respected and were not be shared in the research. However, the researcher used pseudonym names.

4.6. Chapter summary

The methodology chapter was a primarily discussion on how data was collected, the reason behind the data collection tools, the sample of the population and criteria of the sampling. Furthermore, the chapter demonstrates the ethical considerations and data analysis process. The next chapter will focus on data analysis and presentation.

CHAPTER FIVE: DATA ANALYSIS AND DISCUSSION

5.0. Introduction

This chapter presents the empirical findings of the data collected from a group of farmers who are engaging in urban agriculture in Kayamandi settlement, Stellenbosch. This chapter covers data analysis and discussion. Furthermore, the chapter links the findings with the literature, the theory, and research objectives. The research questions will be the main instrument that leads and structures this chapter. Additionally, descriptive statistics will be applied to demonstrate the relationship between variables. The first section of the study draws on the quantitative findings of the study to describe the demographic and socio-economic status of the respondents. The second part presents the state of food security in Kayamandi. The third part demonstrates the reasons why people engage in urban farming and the challenges that urban farmers face. Finally, the last part summarizes the key findings of the research.

5.1. Demographic information

The variables that present the demographic profiles of the respondents include migration, gender, age, education, employment status, marital status, income levels as well as a source of income. The research used a qualitative method to collect data from a total population of 12 participants. It conducted 10 in-depth interviews with purposely selected cultivators plus two informant interviews (one from the Love2Give non-governmental organisation and one member of the Stellenbosch municipality). Therefore, the social economic background of these cultivators will be presented and discussed in the following chapter.

5.1.1. Gender

The majority (58%) of the participants of the study were female at while the rest, 41.6% were male (see Table 5.1). The gender imbalance in the study is due to the tendency of women being more involved in urban gardening. The literature states that women focus more on the household food security and generating income in many developing countries such as Nigeria, Cuba and, Tanzania (Battersby, 2012; Orsini, et al., 2013; Slater (2001). In the Love2Give garden, which is the only garden the organisation runs, both genders benefit from the UA project, but women are the main target. The organization provides diverse sustainable livelihood projects including distributing food to poor school children - since the urban garden is located on school property. This makes it easier for the mothers of the kids to come to the Love2Give garden and engage in farming. Haysom (2015) argues that women are the

majority of urban farmers and play an important part in creating food secure households. Similarly, Krasny and Tidball (2009) suggest that women use urban agriculture for convenience purpose because they can integrate it with their domestic work.

Table 5.1. Distribution of gender

gender	frequency	percentage
Male	5	41.6
female	7	58.3
total	12	100

Source: Author's compilation based on field survey

5.1.2. Age

The variation of the age of participants ranged between 24 and 60 years old. The majority of the participants, 52% are between the ages of 39-52 years old, followed by 25% between the ages of 39-45 years old, as well as 25% between the ages of 46-52 years old. However, there are no <18 years old urban farmers in the sampled group. As the literature suggests, the age range of the participants is lower than those in other South African cities (65+). In contrast, the age range of urban farmers in Zimbabwe is around 36-45 years old. (Crush et al., 2013; Pedzisai et al., 2014). According to the Stellenbosch municipality (2016), older people tend to see food as their primary household need, which validates why the majority of the study's group are old people. Additionally, Azola a female participant linked age with farming by saying, the "majority of us are old and we worry about our kids and what they will eat next" (Interviewee 3, 2017).

Table 5.2. Age distribution of the participants

Age	frequency	percentage
Less than 18 years	0	0
18-24 years	2	16.6
25-31 years	1	8.3
32-38 years	3	25
39-45 years	3	25
46-52 years	1	8.3
60+	1	8.3
Total	12	100

Source: Author's compilation based on field survey

5.1.3. Marital status

In terms of marital status, 50% of the respondents are single and 42% are married while 8% are widowed. Raniga and Ngcobo (2014) argue that women who are single parents and from poor communities face social and economic exclusion, which often force them to look for other means of living such as engaging in UA. Raniga and Ngcobo (2014:516) also state that "single mothers engage in individual livelihood activities that include agricultural production, bead-making, catering, hairdressing, gardening and, sewing". Additionally, UA helps poor single parents to earn income and diversify their livelihood strategies (Slater, 2011).

5.1.4. Education

The educational attainment of the participants varies. Thirty-three and a third percent (33.3%) of the participants finished an ordinary level of education and 25% completed primary school while 25% also completed their vocational education, only 16.6% have completed a university level. This shows that all of the participants had a formal education. Comparing to the average educational level of urban farmers in Cape Town (grade 6) (Breitenberg and Schuurman, 2013), farmers in the study show higher educational attainment. Due to the high unemployment rate in the Stellenbosch area, the cultivators use gardening as a means to secure household food security. Additionally, StatsSA (2014) indicate that the relationship between education and food security is becoming stronger. Similarly, Burchi and De Muro (2016) found a link between food insecurity and a lack of basic capabilities such as

education. Thus, UA is not a common practice only for the uneducated, but also those who have higher educational attainment as Table 5.3 below shows.

Table 5.3. Participant's Level of Education

Education	frequency	Percentage
No formal education	0	0
Completed primary	3	25
Completed ordinary level	4	33
Completed Advanced level	0	0
Completed Vocational education	3	25
Completed University/college	2	17
Total	12	100

Source: Author's compilation based on field survey

5.1.5. Monthly Income

Given the confidentiality of the participants disclosing their income, the questionnaire was designed with income ranges of 0-1000, R1000-R2000 etc. The monthly income of the participants was very low (i.e. <R1000) compared to the average household income in the Stellenbosch municipality which is R2450 per month (Census, 2011). Kayamandi has a very high unemployment rate and insufficient resources. The residents in the area have a low level of literacy and education, which limits their ability to earn more income (Toms, 2015). Although the majority of the participants were qualified to earn an income, one cannot argue that a lack of education resulted in the poor income; rather, high unemployment in the area and the economic situation in the country resulted in such a low-income. Thus, participants use other means to generate income (e.g. UA). Additionally, numerous scholars argue that UA contributes to household income (Crush et al., 2011; Thornton & Nel 2007; Van Veenhuizen, 2006).

Table 5.4. Monthly Income

Between R1000 and R2000	*0*	*0*
Between R2000 and R3000	0	0
Above R3000	0	0
Total	12	100

Source: Author's compilation based on field survey

5.1.6. Sources of Income

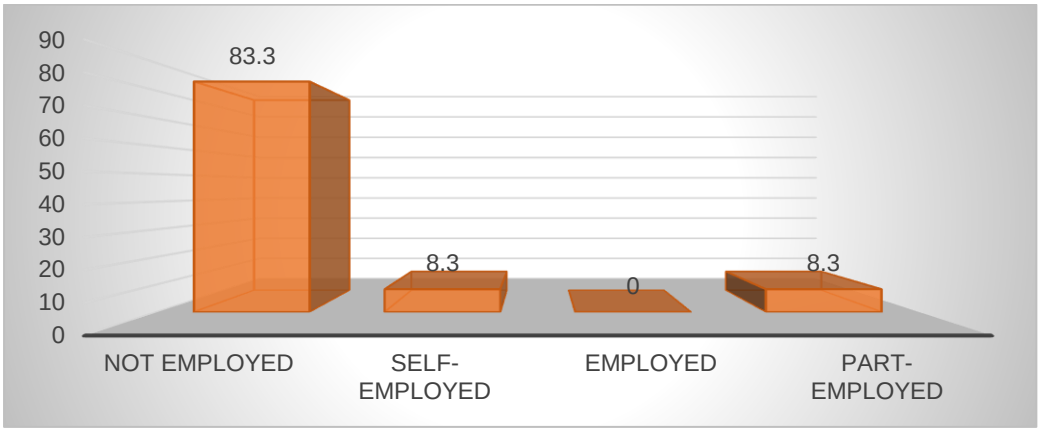
Thirty-three percent (33%) of the participants source their income through either relative, social grants or part-time jobs while the remaining 67% of participants responded that they do not source income, but rather receive food baskets from Love2Give as non-monetary support. This becomes a supplement to the little income some of the participants generate from part-time and self-employment; as well as the social grants supplied by the government. Due to the nature of the questionnaires (close-ended), the researcher allowed the participants to select within four categories (employment, relatives, government grants and NGOs). Urban gardens contribute economically to urban dwellers and provide income through product selling (De Bon et al., 2010; Battersby, 2011). The practice offers not only food but also improved nutrition, higher cash incomes as a result of selling produce, and improved employment status (Crush et al., 2012).

5.1.7. Employment

The unemployment status of the participants is around 83.3% while the rest are self-employed, about 8.3% and employed part-time, 8.3%. Participants engage in farming for food in the Love2Give urban garden in order to provide for their families. This could save income for the participants for not buying vegetables and bread since they receive from Love2Give. Kayamandi is a poverty-afflicted area with high economic marginalization, which hinders the participant's opportunity to escape unemployment, poverty and food insecurity. As a result, this community can only find occasional jobs as well as self-made opportunities such as selling meat on the street. A study conducted by Kasumba (2007) in Queenstown, South Africa found that UA could decrease unemployment through cultivation. Similarly, the municipality of Governador Valadares in the State of Minas Gerais in Brazil

used UA as a way to fight against increasing unemployment. The below figure shows the level of unemployment in the studied group.

Figure 5.1. Employment Status



Source: Author's compilation based on field survey

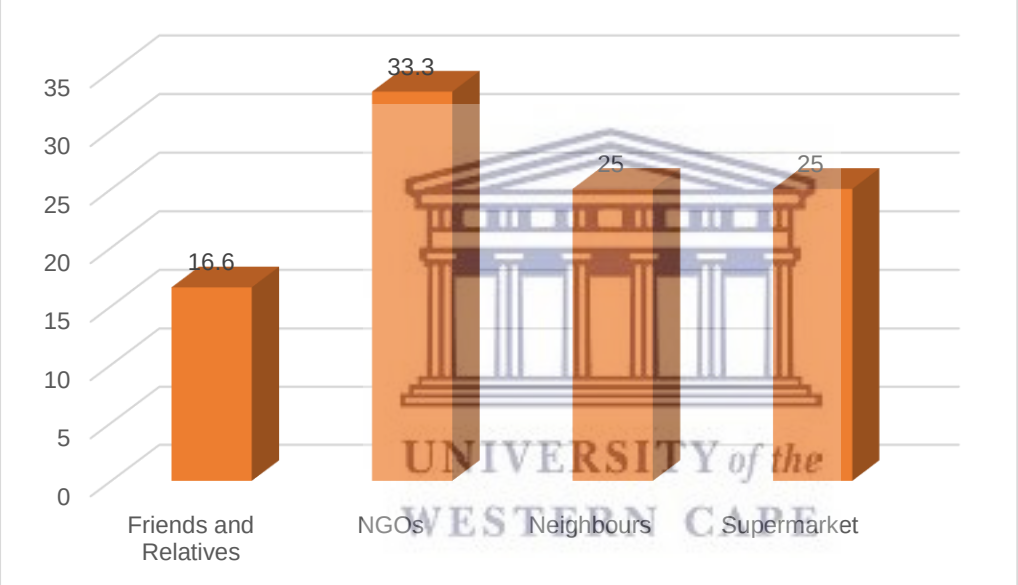
5.1.8. Migration

Fifty percent (50%) of the participants migrated from the rural areas while 42% were born in Kayamandi and 8% migrated from the other towns. Migration has become a global trend. De Zeeuw et al. (2011) state that 60% of the world's population is predicted to live in urban areas by 2050. Similarly, the City of Cape Town noted the in-migration of the population from rural areas to Cape Town which makes Kayamandi migration trends to align with the City of Cape Town. Additionally, the population of Stellenbosch has grown from 60,000 in 2001 to 90,000 in 2010 (SM, 2016). Therefore, the current migration into Kayamandi settlement is not an exception to global migration trends. Moreover, the participant's duration of stay in Kayamandi differs. Sixteen percent (16%) of the sample lived in Kayamandi for 4-6 years, 33% lived for 7-9 years and 50% of them lived in Kayamandi for more than 10 years. This indicates that although the majority of the participants migrated to Kayamandi, 50% arrived more than 10 years ago. This corresponds with Statistics South Africa's estimate, which indicates that two-thirds of South Africa's population live in urban areas (StatsSA, 2017).

5.1.9. Source of Food for the Households

The participants of the study predominantly source their food from NGOs through cultivating in the community garden. Just over Thirty-three and a third percent (33.3%) of the respondents source their food from Love2Give followed by 25% who source it from neighbours and 25% who source it from supermarkets. Only 16.6% source their food from friends and relatives. Urban dwellers mostly depend on buying their food from supermarkets (Van Vuuren, 2016; Battersby, 2011). However, in the case of this study, participants depend on their own cultivation by engaging in UA. Additionally, after harvesting vegetable participants buy their extra household food needs from the supermarket.

Figure 5.2. Source of Food for the Gardeners



Source: Author's compilation based on field survey

5.1.10. Household density of the respondents

Fifty percent (50%) of the respondents of the study had 1-2 members in their households. This was followed by 33% with 5-6 people in their households. Approximately 17% had 2 people in their households. The study indicates that presumably, the assumption is that those with big families in poor communities are more likely to be food insecure (Altman et al, 2009). The findings of this study found that families could have very small households and still suffer from chronic food insecurity that exists in most townships in South Africa. However, the sample of this study is very small and hence the findings cannot be generalised.

Table 5.5. Household Size

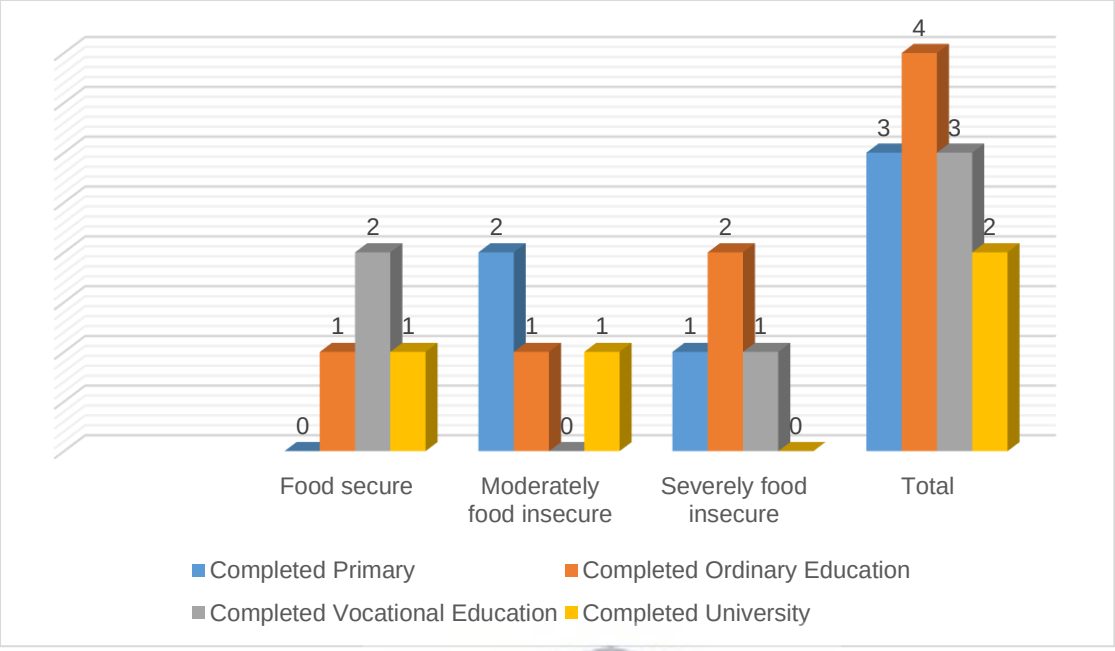
Household Size	Freq.	Percentage %
One-Two	6	50
Five-Six	4	33
Six and more	2	17

Source: Author's compilation based on field survey

5.2. Food security and education

Education plays a significant role in determining the food security status of households. The role education plays is essential for enhancing the ability of urban and rural farmers to adopt more advanced technologies and crop-management practises (Godfray et al., 2010). Similarly, De Zeeuw (2011) notes that the lack of education and information hinders urban gardeners' ability to predict and withstand shocks and stresses. This is especially true in the context of climate change. The conditions of the households differ from category to category. As Figure: 5.3 shows only 4 households (33.3%) are food secure with 1 (8.3%) completed ordinary education (high school) while 2 (16.6%) completed vocational education and 1 completed university level; the rest of the participants are either moderately food insecure or severely food insecure. This shows that none of those who finished primary and secondary school are food secure. The higher the level of education the more likely it is that the household will be food secure. Statistically, the correlation between education and food security has shown a negative relation (-0.45), which states that whenever the educational level of a household increases, the food insecurity of that household decreases.

Figure 5.3. Food Security by Education



Source: Author's compilation based on field survey

The FAO (2005:12) argues that "lack of education undermines productivity, employability and earning capacity, the standard of living and this directly leads to poverty". According to Mthethwa (2012), the research findings from Orange Farm Township in Johannesburg indicate that 80% of urban agriculture farmers only had primary education level, which negatively affected their food status. This suggests that the majority of urban farmers are those with low levels of skills who use farming as an alternative food source. Additionally, the majority of poor people perceive education as a strategy to escape poverty and food insecurity (Petzer, 2015). Education is a human capital component that can improve the lives of vulnerable individuals; as such, it is viewed as one of the most legitimate and effective ways to fight against the phenomenon of food insecurity. These findings suggest that people with higher levels of education are more likely to tackle their vulnerability and improve their household or individual food security.

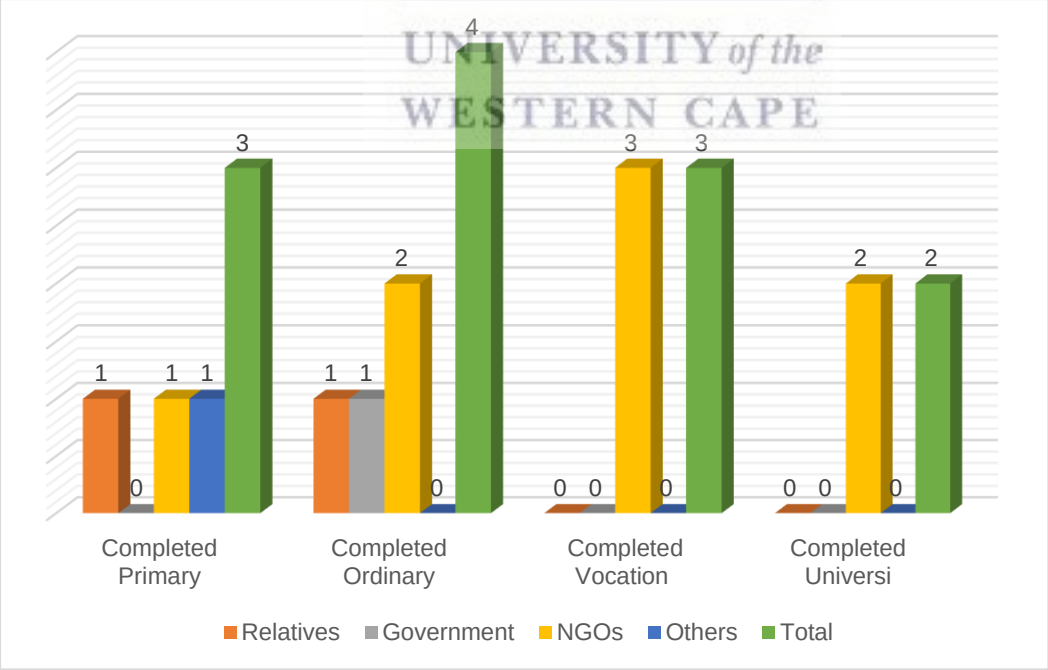
5.3. Education and source of income

Without income, access to food is a challenge for urban households in South Africa. Ndhleve et al. (2012) found that households with insufficient access to food were less educated and earned low incomes. Similarly, Frayne et al. (2010) point out that education and income are positively related to food security. The Stellenbosch municipality (2015) described education

as an important engine for alleviating hunger and poverty. Labadarios et al. (2011:20) stated that "Individuals who have acquired higher levels of education are more likely to secure jobs and increase their capacity to acquire resources efficiently". Thus, education is critical to the ability of poor people to escape poverty and hunger, as it is illustrated in Figure 5.4.

With regards to the data from Kayamandi settlement, a number of participants responded to Love2Give's skills training, micro-business, and vocational courses as well as food baskets. Figure 5.4 below indicates that the majority of the participants (67%) who finished their vocational education saved income through receiving food from NGOs (Love2Give) while one female participant sourced her income from relatives and 2 male participants aged between 52-62 years old, generated their income from government grants, respectively. Since the majority of the participants are not employed (84%), they engage in UA at Love2Give's garden in order to feed their families. In the literature, education could be a valuable asset for urban gardeners. It creates opportunities and diversifies their livelihoods through providing extra income. In addition, the findings indicate that urban gardening builds financial capital for poor households. It allows the vulnerable communities to save money in order to invest in other capitals (e.g. human capital and physical capital) that may improve their livelihoods.

Figure 5.4. Education by Income

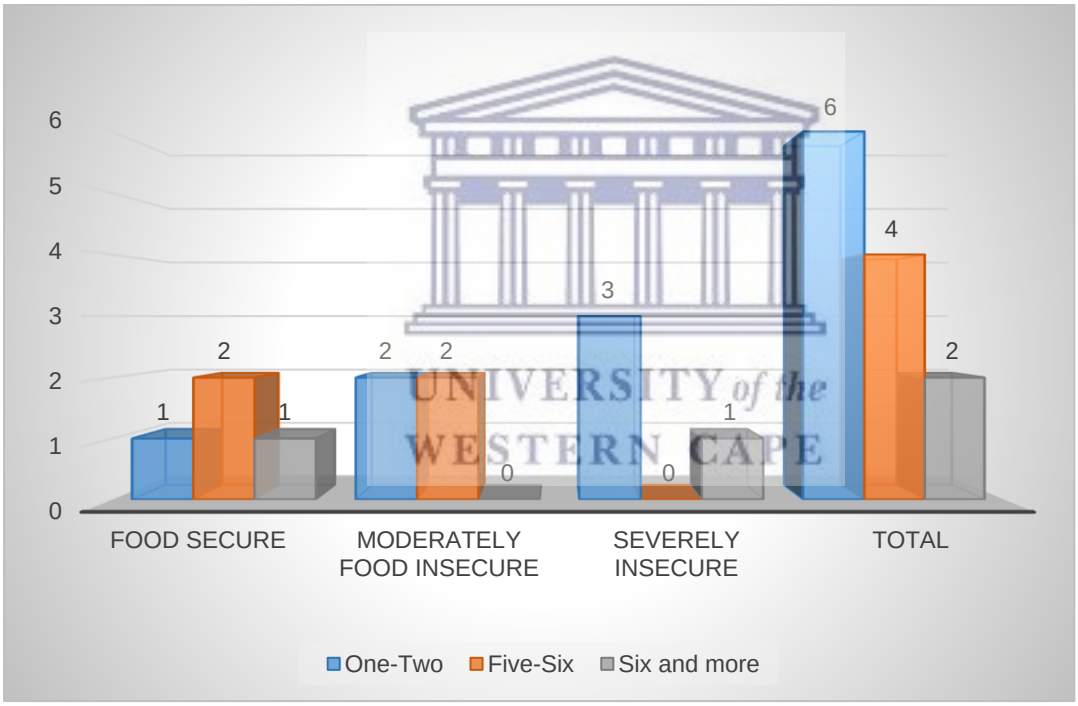


Source: Author's compilation based on field survey

5.4. Household size and food security

The participants indicated that all participants earn less than R1000 per month. Lack of sufficient income may lead households to become food insecure. However, household size could be another factor that contributes to the state of food insecurity in urban households. The state of unemployment and underemployment play an important role in food security in households (Altman et al., 2009). Traditionally, when people abandon agriculture, household sizes shrink due to the migration of household members to other areas while also shifts into agriculture are associated with increased household size. Crush and Tawodzera (2017) associated low household size to food security by indicating the lower the household size is; the more food secure that household becomes.

Figure 5.5. Household size and Food Security



Source: Author's compilation based on field survey

Typically, the larger the household, the greater the chance of that household being food insecure. However, Figure 5.5 indicates that those with 1-2 members in their households have 1 household (8.3%) that is food secure while five households (41.1%) are either moderately food insecure or severely food insecure. Additionally, those with 5-6 members in a household are better off because two households (16.6%) are food secure while two (16.6%) are moderately food insecure. Households with more than six members have one food secure (8.3%) and one household (8.3%), which is severely food insecure.

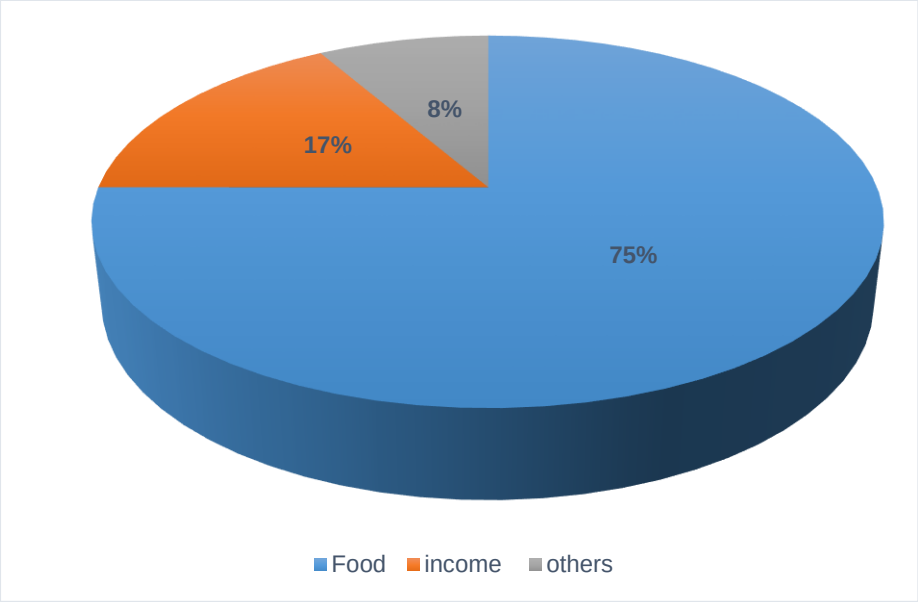
Altman et al. (2009) argue that urbanisation and neglecting agriculture create low productivity within families. Families with lower household levels are food insecure because they are likely to be migrants who may not have the necessary skills to find jobs in Cape Town. Employment and gender disparity also play a role in the food insecurity of households, because the majority of the participants are women with kids. Therefore, they prefer to do urban gardening in the school's backyard while their children are also attending that school.

5.5. Determinants of urban agriculture production

The variables that determine urban agriculture production in Kayamandi includes the duration of engaging in UA, the reasons for gardening, and the variety of agricultural activities. To start the duration participants engaged in UA, a significant number (10) have been practicing UA for 1-3 years (which makes up 83% of the sample) while 1 (8%) participated for less than one year, and another 1 (8%) participant engaged in UA for 4-6 years. Webb (2011) stated that the duration of cultivators who engage farming is determined by the benefits they get from UA. A Love2Give member explained that "the area is overcrowded with newcomers as well as the old cultivators. People farm for the benefits they receive from Love2Give" (Interviewee 4, 2017).

Furthermore, the reasons why they are practicing urban gardening varies: Seventy-five percent (75%) responded that they are farming to get food while 16% responded they are farming to earn an income, and the rest (8%) answered that they are doing it for other reasons such as exercise, social interaction and community engagement. Philiswa, a female participant stated that "I farm to forget all my problems. When I am farming with other women I feel happy because we share our problems and give guidance to each other" (Interviewee 8, 2017). This is a clear example of how the sustainable livelihood approach influences the lives of poor people. In this case, a strong social capital can be seen within the statement of the participants. The woman felt connected to the other cultivators in the garden. Therefore, gardening could create a networking environment where cultivators share their problems in order to come up with a common solution.

Figure 5.6. Reason respondents engage UA



Source: Author's compilation based on field survey

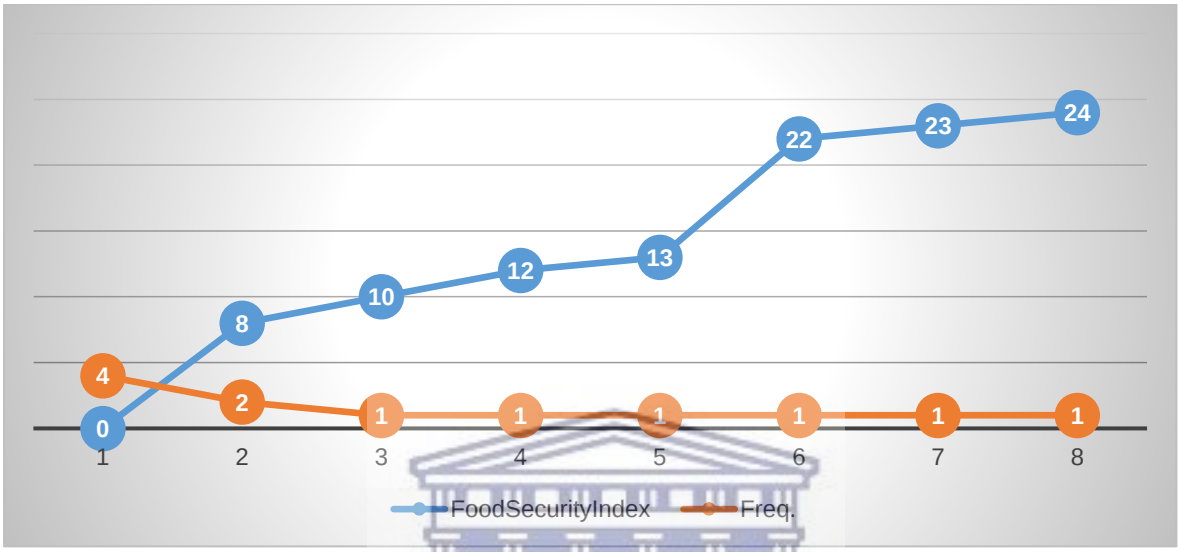
5.6. Food security categories in Kayamandi

According to the FAO (2005:15), "all people, all the times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active healthy life". It is when the household has the ability to secure sufficient food by either producing or purchasing food for all the members of the household. Household food security is a significant element of community health. Finding food to eat is one of the biggest challenges for urban dwellers in developing countries (Zezza and Tasciotti, 2010). To understand household food security in a country, it is important to investigate the food distribution system and other resources that determine food access (SM, 2016). South Africa is categorised as a food secure country. However, national food security does not guarantee food security at the household level. Food security is no longer regarded as a problem of food supply but rather as livelihood failure because of inadequate access to acquire food (Battersby, 2011). While South Africa does not have a problem with the supply or availability of food, it is the inability of the poor to purchase or access food that is the problem.

Moreover, household food insecurity in South Africa is highly correlated with widespread chronic poverty and unemployment. Household food insecurity is further pressured by other factors such as electricity supply, rising oil prices, rising food prices such as maize and

wheat. These problems pose a serious challenge to urban and rural households. Therefore, the measurement of food security becomes a challenging factor. Figure 5.7 below demonstrates one of the existing tools to measure food security by using the Household Food Insecurity Access Scale (HFIAS) measurement technique.

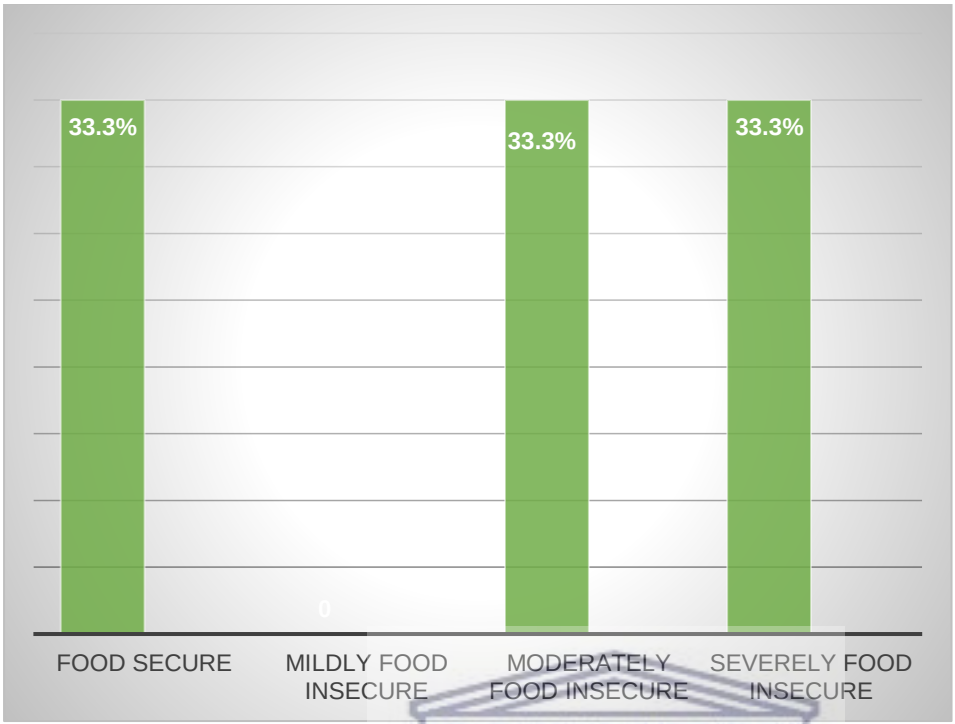
Figure 5.7. Food security index in Kayamandi



Source: Author's compilation based on field survey

The HFIAS (Household Food Insecurity Access Scale) score is a technique based on the sums of all the frequency-of-occurrence questions in the survey. It is a set of follow-up questions which determine whether the household is food secure or not. The HFIAS has an internationally accepted scale of 0-27. This means that the higher the score, the more food insecure the household is. The lower the score, the less food insecure a household is. However, statistical analysis indicated that the highest score of food insecurity among the participants of this study is 0-24, Figure 5.7 shows the score and frequency of participants. It also indicates that there are only 4 households who fall under the score of 0 meaning that they are food secure and responded NO to frequency-of-occurrence questions. The rest of the participant's score varies between 8-24, which also means that they responded YES to the frequency-of-occurrence questions. Those who fall between 8-24 score are either moderately and severely food insecure.

Figure 5.8. Food Security Categories



Source: Author's compilation based on field survey

Statistically, the average household HFIAS score for Kayamandi residents was very high (14), with a median of 12.5. On the HFIAS scale, only 33.3% of the participants were food secure while the other 33.3% were moderately food insecure. The majority of the participants were either moderately or severely food insecure (66.6%). Although the sample of the study is very small, the HFIAS score suggests greater levels of food insecurity in Kayamandi compared to other the low-income areas in Cape Town (Battersby, 2011; Haysom, 2017).

Furthermore, from a gender perspective, the households that are food secure are female-headed households while all male-headed households were either moderately (25%) or severely food insecure (16.6%). Interestingly, these findings contradict the existing literature. For instance, a study conducted by Battersby (2011) found that men are more food secure than females in Cape Town. However, Crush et al., (2013) noted that female-headed households are more likely to engage in urban agriculture than male-headed households. Therefore, gender becomes an important variable when looking at the relationship between urban gardening and food security.

Moreover, the link between food security and age differs among households. Figure 5.9 demonstrates that those who are food secure are scattered among the age groups.

Nevertheless, 16.6% of those who are food secure fall under the age group of 39-45 followed by 8.3% from the age group of 60+. Only 8.3% are from 25-31 years of age. This shows that those who are under the age of 39 are either moderately or severely food insecure. However, food insecurity is much worse in older individuals as figure 5.9 indicates. 16.6% from the age group of 46-52 are severely food insecure followed by 8.3% from the 60+ age group. The data indicate that those older than 52 years of age are more likely to be food insecure. In the Love2Give gardens, the majority of the beneficiaries are old people with limited skills and job opportunities. This illustrates the testing situation in Kayamandi, where poverty is prevalent and unemployment is high. As indicators, these social challenges lead the community to be more vulnerable to food insecurity. According to Rose and Charlton (2002), elderly headed households (60+) in the poor areas are 1.8% times more likely to be food insecure than young people. A study done by Nyirenda et al. (2018) in KwaZulu-Natal suggests that food insecurity increased with age and is highest among adults older than 37 years.

Figure 5.9. Food Security by Age

Source: Author's compilation based on field survey

Moreover, there was a cross tabulation between marital status and food security. In the food secure category, only 25% of households were food secure, with 8% being widows. However, 50% (single) and 17% (married) are either moderately or severely food insecure.

The variable ‘marriage’ can be very important for household food security. It is a livelihood diversification factor in terms of income generation. For example, a male cultivator stated that “I rely on my husband because he works and earns extra money, this money covers a lot of our needs” (Interviewee 4, 2017). As a source of income, family support plays an important role in creating financial capital within the family. Although depending on family support may not be sustainable, it is a valuable asset to poor households for their livelihood diversification. In fact, remittance from family members contributes to poverty alleviation (Morse and McNamara, 2013). Additionally, Labadarios et al. (2011) stress that single people are more vulnerable to food insecurity because they lack income diversification or other alternatives to make money whereas married respondents tend to have someone to rely on or receive government funds through child support.

5.7. Urban agriculture and food security

Theme 1. **The role of urban gardening**

The NGO, Love2Give, creates a suitable environment for urban gardeners. It has been remarkably successful in helping children and their mothers. Currently, Love2Give provides nutritious food to 3200 children and 100 mothers who engage in the sustainable livelihoods programmes such as gardening, income generating opportunities, training, and mentorship (Love2Give, 2016/17). However, this study will only emphasise the role of gardening on food security on purposefully selected members within the beneficiaries. A number of participants viewed urban gardening as a complementing factor to their income. Love2Give provides food baskets to those who engage in gardening in the Love2Give garden. This contributes to the household food security of urban cultivators. For instance, Luviyo explained that “the monthly food baskets make a massive difference in our food security because I do not need to buy vegetables [and] I can use the money for something else or even save it” (Interviewee 5, 2017). Additionally, Azola explained further, by saying,

> *UA helps us to feed ourselves; we do not go hungry, we become better people because we use UA as a source of livelihood. I also engage in urban gardening to interact with others in the community to share our challenges and inform our problems with Love2Give so we can find solutions.* (Interviewee 3, 2017).

The participants stressed not only food but mentioned the importance of self-reliance. They also associated UA with social interaction and empowerment. The majority of the participants see UA as practice that allows them the freedom to farm and associate or

network with each other. UA builds human and social capital as the participants stated. It creates a self-reliant community with the skills to farm as well as a socially connected community with strong bonds. In the literature, scholars emphasise how UA contributes to food security and affects the lives of urban gardeners (Zezza, and Tasciotti 2010; Philander, 2015; Philander and Karriem, 2016). They also stress the extent to which urban households benefit from UA, whether it is for sale on the market or for personal consumption. UA has been the center of concern as a means to address food security in Cape Town (Battersby and Marshak, 2013).

Furthermore, participants emphasized the nutritional aspects that UA contributes to their lives. Due to high food prices, healthy food becomes a challenge for many poor South African households (Battersby, 2011). The Love2Give beneficiaries stated that urban farming gives them an opportunity to eat nutritious food. Sizeka, a female participant stated that "UA makes a difference because whatever we plant here, we harvest and take it home, this increases our nutritional intake" (Interviewee 10, 2017). To avoid poor nutritional choices, the studied group consume fresh food which is a product of their own. This contributes to the health status of the community as well as creates space for the children to be connected to the environment. The manager of Love2Give garden said that:

> *[U]rban gardening contributes to food security because those who do urban farming in our gardens learn about harvesting and produce their own food such as cabbage, onions, beetroot, spinach, carrots etc. The urban garden in Kayamandi helps the community to eat healthy food and gain nutritional benefits (Manager Interview, 2017).*

Furthermore, Battersby, (2016) and Thornton and Nel (2007) argue that UA has the ability to improve food and nutrition security, alleviate poverty and generate some income for poor households. Similarly, Dutt (2016) stated that UA creates social cohesion and builds communities. Participants in Kayamandi see UA as an important factor in their day-to-day livelihoods; it feeds their family and connects the community as a whole. Additionally, UA can be an asset to the urban poor communities by creating spaces of social interaction particularly establishing a peaceful environment where people trust one another (Serrat, 2017).

Researchers and policymakers have acknowledged the role of UA on food security, poverty reduction, and poverty alleviation. However, there are scholars, like Rogerson (2003) and

Webb (2011), who argue that the impact of UA is insignificant and does make much contribution. This data from Kayamandi, however, shows that UA can play an important role in promoting household food security.

Theme 2: **Reasons for urban gardening**

Urban farmers have diverse socio-economic backgrounds. The practice of urban gardening shows that people engage in urban farming for food to consume but also there are other reasons that force them to farm *(*Galhena, et al., 2013). In relation to the interviews, the responses have strengthened the existing literature by giving diverse reasons such as economic benefit, food, physical wellbeing as well as agricultural linkage.

Food consumption: The quantitative findings found that 75% of the participants in this study engage in urban farming for food consumption purposes, a finding corroborated by the qualitative research. For instance, Zimasa said that "I farm to get food, especially to get vegetables for my kids, this is a way of feeding myself" (Interviewee 7, 2017). Both methods uncovered that people farm for food, a finding that concurs with the literature (Haysom, 2017; Grote, 2014; Onyango 2010).

Economic: is another main factor that leads people in Kayamandi to engage in urban farming. Farming allows cultivators to diversify their income and save some of their expenditure. It is a livelihood strategy that the participants use to reduce their vulnerability to economic stress and shocks. Since 75% of the participant's farm for consumption purposes, some engage in farming to supplement their income and reduce household vulnerability. This gives the participants the financial freedom that allows them to deal with economic crises. Nokulunga responded that "I am engaging in urban gardening because I am struggling and unemployed. I am practicing [urban agriculture] to gain skills and diversify my food income" (Interviewee 1, 2017). This means that poor households are vulnerable and cannot purchase all their food needs from supermarkets or tuck shops, and therefore need to diversify in order to afford their non-food items. The diversification methods the participants use include social grants, part-time jobs and, self-employment.

According to Van Veenhuizen (2006), UA reduces poverty, creates employment as well as increases the levels of incomes. Similarly, De Bon et al. (2010) and Mkwambisi et al. (2009) argue that urban agriculture can be economically significant to the urban dwellers by providing income through product selling. The findings of this study show that people engage in urban gardening for diverse reasons. The importance of urban agriculture as an income

generating method is acknowledged by both this study and other research findings (Battersby, 2011: Crush et al., 2012; Battersby and Marshak, 2013). The implications of this factor are that it allows the participants to have the ability to access food through producing and purchasing food and could ultimately lead to food sovereignty.

Physical wellbeing: throughout the interviews, participants recognised the importance of consuming healthy food. The beneficiaries in the Kayamandi gardens rely on the skills they learn from Love2Give workshops, which teaches the importance of consuming nutritional food and use gardening as an exercise method. Philiswa indicated that "I do farming because it helps me exercise while producing food, I also engage in farming to feed my kids with healthy food because it is good for their cognitive development" (Interviewee 9, 2017). This cultivator stresses the impact of UA on her physical well-being while the fresh food also provides her kids with good healthy food. Further, Azola indicated that "It helps my stress level because there are plenty of females who come here so when I interact with them I forget everything and focus on farming" (Interviewee 3, 2017). The farmer acknowledged the positive role of UA on her mental health by decreasing her stress levels. The qualitative finding suggests that farmers have a good perception of the food that has been produced from the gardens; they believe that it is healthier and fresher than the ones from supermarkets.

Agricultural linkage*:* The participants repeatedly noted the importance of agriculture in their lives. The findings show that some of the participants had an agricultural background in their childhood. Zimasa said that:

> *The reason I am engaging in urban farming is that it keeps the linkage between me and my home, [and] it reminds me of my father who used to farm and still farms. It's kind of my heritage and after coming to Cape Town I developed a lot of interest in gardening* (Interviewee 7, 2017).

Similarly, Sizwe states that "I am engaging in urban agriculture because I have experience about farming; I am doing it to gain more knowledge about farming and also to be able to eat at home" (Interviewee 6, 2017). In addition, the findings validate that having an agricultural background increases one's chance of engaging in urban farming in later years.

Furthermore, the findings highlight that urban gardening promotes social responsibility. For instance, Sizeka said "I am engaging gardening to learn how to farm and harvest, once I harvest I feel happy and also I share with my neighbours if they do not have anything to eat (Interviewee 9, 2017). Gardeners view farming as a way of tackling hunger in their

households while helping others to be food secure. In addition, the findings show that participants see UA as a livelihood strategy with which they are more familiar, are more preferable to and become more consistent over time. Some see farming as a passion as Thembelani indicated "I love farming, it was my passion ever since I was little" (Interviewee 4, 2017). The following figure gives a glimpse of what Love2Give Gardens looks like.

Figure 5.10. Love2Give Garden

Source: Author (February, 2018)

Theme 3: **Contribution of Love2Give**

Love2Give is an organisation that provides Asset-Based Community-Driven Development (ABCD). The main objective of the organization is to build communities from inside and outside. Love2Give also supports communities in Kayamandi to create their own employment opportunities through asset diversification. This section will focus on answering the following question: what is the contribution that the NGO (Love2Give) made towards the urban agriculture project?

Tangible contributions

According to the majority of the participants, Love2Give is the sole contributor of all the inputs in the UA project. The organization provides both tangible and intangible contributions to the community in Kayamandi. The tangible contribution can be defined as stores and cash savings, as well as trees, land, livestock, tools, and other resources (Murugani et al., 2018). A substantial number of participants said that Love2Give provides them with access to land for productive purposes, which are huge contributions considering the history of landlessness in Black communities in South Africa. The land is a significant asset to the

rural and urban poor households in South Africa (Jacobs et al., 2003). However, the community in Kayamandi, especially those who benefit from the Love2Give project, are landless. This means the majority of the beneficiaries who form part of the organisation are able to grow food for their households through this opportunity given by Love2Give. Most of the participants associated their limited capacity to source food to the failure of the government to provide support. To provide an example, Sizwe said, there is "no local government support, we only depend on Love2Give, they give us land to farm" (Interviewee 6, 2017). In contrast, the local government in the Stellenbosch municipality argued that the Department of Agriculture supports all the gardens around the Stellenbosch area by profiling. A member from the department of agriculture stated that:

> *We support and give starter packs to start farming which contains farming inputs such as pipes, water can, seeds including beans, spinach, beetroot, carrot, onion, and tomato. The Department of Agriculture gives us a target and we do profiling. For example, the department will tell us we need to have these numbers of gardens in Stellenbosch in 2018. Therefore, after that, we talk to community workers who do urban farming. Then they will identify the people who need help in terms of farming then we profile and check if they are really struggling and check their income. Then based on income they are either approved or rejected. If they earn more than R3000 then they do not qualify. So, once we do that we go to the community to deliver the stuff. Also, we give what the community wants because the black community and coloured community might not want the same seeds. Based on this we decide what to give to the community* (Government official, 2017).

Considering the level of income of the beneficiaries in Love2Give which is below R1000, they would have qualified for the contribution of the Department of Agriculture. However, the gardeners argue that there is no support from the local government which indicates the disconnection between the urban farmers and the Department of Agriculture. A Love2Give member suggested that the local government does not seem interested in reaching out to those who are in need.

Furthermore, the food that the organization distributes is mainly groceries, which includes bread, vegetables, and mealie meal. To qualify for the monthly food baskets provided by Love2Give, one has to farm in the garden. This encourages urban gardening practices for poor urban households and is aligned with the City of Cape Town's urban agriculture policy

which promotes, "enabling the poorest of the poor to utilize urban agriculture as an element of their survival strategy (or means to secure food)" (CCT, 2007). Additionally, Love2Give offers land and farm inputs such as farming equipment, seeds, and plants. These are tangible contributions which can attract urban farmers to come and practice farming to feed themselves. The capacity for cultivators to start farming directly relates to their ability to access natural capital (e.g. land) which limits their productivity. Therefore, the accessibility of land and farming inputs encourages the farmers to produce more and gain financial capital. For instance, the Love2Give representative stated that,

> *[W]e give the farmers a set of equipment, seeds, and plants which make their lives easier, because if you just give people training for farming, they still lack inputs, therefore, we try our best for the farmers to have all the necessary farming inputs to their disposal* (Manager, 2017).

According to Van Vuuren (2016), farming production would not be stable or sustainable without proper training, seeds and plants. Therefore, providing incentives to vulnerable communities might alleviate poverty and eradicate hunger (Zezza and Tasciotti, 2010). Love2Give practices this approach in a manner which empowers its beneficiaries.

Intangible contributions

Intangible contributions are assets that cannot be seen or touched. It can be the claims to make food, work, and assistance as well as access to materials, information, education, health services and employment opportunities (Joosse and Grubbström, 2017). In this study, the participants mentioned intangible assets such as workshops, training, advice, internet access, CV writing, development of meaningful connections and friendship, as well as farming skills. These intangible contributions play an important role in the lives of the poor households in Kayamandi, especially those who benefit from Love2Give's UA project.

These intangible assets could help the cultivators to gain skills and knowledge which eventually lead them to utilize the livelihoods assets at their disposal. Similarly, through creating farming environments, cultivators develop connections with other farmers which promotes social capital. This will benefit the farmers by sharing information and helping one another in times of stresses and shocks.

Although all the participants do their farming in a community garden, some of the respondents have their own home gardens. These participants receive extended support from

Love2Give through proactive guidance and advice. This is what the NGO representative had to say in this regard:

> *We offer them support in terms of helping for those who have gardens in their home, we give them advice and plants. When their plants are dying we go there and tell them what is wrong and how to deal with it. We help them if they need in sidling* (Manager, 2017).

Moreover, the workshops that Love2Give provide the participants with, focus on training for effective methods of planting, pest control and safe ways of growing vegetable crops. Commonly, those who have home gardens have a limited capacity to procure seeds which then limits the variety of crops they can grow. The majority of the participants expressed their gratitude for the support they receive from Love2Give although they must still deal with shortages of seeds. This shortage, curbs production. To illustrate this, Luvuyo said,"my intention is to acquire skills and learn how to sustain the food availability of my family but we have limited seeds and plants which deters our production" (Interviewee 5, 2017).

The government and NGO's encourage and support urban agriculture (SM, 2017). Specifically, as suggested in the previous section, NGO's such as Love2Give primarily support urban farmers in order to improve the livelihoods of urban cultivators. Zezza and Tasciotti (2010) note that urban agriculture can be one aspect of using resources in a sustainable way. This data has shown that UA plays a significant role in reducing poverty and food insecurity. The Sustainable Livelihood Approach adopted by Love2Give, is one major contributor, among others, to the success of the project. SLA promotes capacity building and empowering the communities. Essentially, Love2Give centres its functions on these core principles for the benefit of the community. Sizeka said, "I feel empowered because I can do things for myself without depending to anyone" (Interviewee 9, 2017). This is just but one account of many other participants who feel that Love2Give gives them the freedom to farm and feed themselves without losing their dignity.

5.8. Livelihood strategies

Livelihood diversification is the norm. Asset, income and activity diversification plays an important role in human survival. Generally, there are two motives behind livelihood diversification. The first motive is known as 'push factors' whereby people diversify assets to reduce risks, respond to diminishing factors (e.g. land) that can destroy their assets. Secondly, the other motive is termed 'pull factors' which focuses on the understanding of strategy

complementarities between activities such as crop-livestock integration or introducing specialization of techniques for comparative advantage purpose (Maniriho and Nilsson, 2018). In Kayamandi, people deploy diverse strategies for their survival and acknowledged the importance of implementing multiple livelihood strategies. To be food secure, the respondents implemented the following themes such as gardening, business, social grants, family help as well as part-time jobs.

Gardening as a strategy

Studies have confirmed that home gardening is an integral part of local food production in developing countries (Galhena et al., 2010). Home gardens are mainly practiced to produce food for household consumption. As a strategy, gardens contribute to overall socio-economic phenomenon such as improving family health, building human capacity as well as preserving indigenous knowledge and culture (Kelly and Schulschenk, 2011). Regarding Kayamandi residents, gardening is a fundamental strategy that keeps poor urban households to meet their daily food needs as Thembelani indicated: "I am doing gardening to support my family food needs" (Interviewee 4, 2017). Furthermore, Sizwe explained the role of urban gardening in their livelihood by saying, "gardening gives us fresh and healthy food, the food that we get from gardening goes along any dish; for example, cabbage" (Interviewee 6, 2017). Most of the gardeners agreed that without the Love2Give garden their life would be in a difficult position. As the a result of poverty, unemployment and food insecurity, Kayamandi residents see gardening as an important alternative they can feed themselves.

Furthermore, community gardens directly contribute to household food and nutritional security through increasing the availability, accessibility, and utilization of food. Poulsen et al. (2015) state that community gardens products add substantively to the family nutritive necessities on a continuous basis. Therefore, community gardens offer cheap food with nutritional qualities. Moreover, Love2Give encourages urban gardening by proving the community seedlings and training to increase their food security, and improve the variety of micro-nutrients available in the family.

Business as a strategy

According to the literature, people in Kayamandi settlement live in harsh and vulnerable socioeconomic situations. As a result, households in Kayamandi face poverty, high unemployment, and under-employment rates and limited work opportunities in the informal sectors. Due to this lack of formal jobs, residents create opportunities in informal

sector such as street vending and hawking. Battersby and Haysom (2018) state that street vending is a livelihood strategy which creates jobs; it provides food and generates income for the poor households in the country. Moreover, respondents in this study repeatedly accredited the importance of conducting business as a form of insurance. Nokulunga states that "I engage in business by selling meat on the streets, it does not give me much but it helps for me to get something to cover up my needs…it is helpful" (Interviewee 1, 2017). In this case, the participant used vending as a supplement to diversify her family's income. Additionally, Zolile, an elderly gentleman said: "I sell vegetables in front of my house, I sell the harvest I get from Love2Give community garden to earn extra money" (Interviewee 2, 2017). This particular respondent created his own garden in his own backyard to generate extra income since the food Love2Give provides does not exceed consumption. Generally, conducting business is an empowering act, which gives poor people a way to escape poverty and create something for themselves without waiting for state funding.

Furthermore, livelihood diversification plays a great role in reducing vulnerability to poverty by creating protection for poor households to avoid risks. Gamieldien et al. (2017) stated that street vending/hawking can be a tool to alleviate poverty. In this regard, the finding of this study does not contradict with existing literature which indicates the significance of business for poor households in Kayamandi. Additionally, the literature also shows that street vending contributes 7% to the Gross National Product (GDP) and generates 22% of total employment in South Africa (Gamieldien et al., 2017). Altogether, the finding indicated that the majority of the urban farmers in Kayamandi engage in street vending as a livelihood strategy in order to reduce poverty, avoid risks and establish ways sustainable ways to live.

Social grants strategy

Social grants have become a major source of income for the poor and vulnerable households in South Africa. Despite social grants being key social protection in South Africa, there are only two participants who responded to social grants as a livelihood strategy in Kayamandi. However, this does not mean other respondents do not receive social grants; rather, the structure of the questionnaire gave limited options to the respondents where they could only choose one option. For example, Philiswa indicated said that "when I do not have food I ask for the neighbour to lend me money, and also I receive a social grant which keeps me to sustain my food availability at home" (Interviewee 8, 2017). The respondents were asked what measures they took to ensure there is food in their respective households. The

participants recognize social assistance as an important livelihood strategy, which adds great value to their life. In this regard, Sizwe explained further that:

> *I am a poor urban farmer, when we harvest, Love2Give gives as food baskets. This does make me food secure in the sense that when I get social grants I can also buy a grocery with the little I get from SASSA. It is hard, but I plan my life...sometimes I use the grants to pay school fees* (Interviewee 6, 2017).

There is an enormous literature on the role of social grants in alleviating poverty in South Africa. The Stellenbosch Municipality (2015) stressed that the majority of those who receive social grants are likely to spend it on food. Further, scholars like Gutura (2013) recognized the prominence of social grants in poor households in South Africa as a poverty reduction strategy. Additionally, Akinboade and Adeyefa (2018) state households that receive social assistance are more likely to send their kids to school and provide nutritional food. In relation to the respondents, they demonstrate the effectiveness of social grants in the sense that it increases their income and creates diverse options to generate a livelihood. In contrast, although the literature shows the significance of social grants, the data, however, shows that it can only be a supplement to the other livelihood strategies mentioned above. It might not be significant, but social grants could add a valuable contribution to the lives of Kayamandi settlement residents.

Family support as a strategy

Using family as a livelihood strategy is a common practice among urban farmers in South Africa. In Kayamandi, a number of respondents stated that family support makes a big contribution to their household food security. For instance, Zimasa said, "it is hard to secure food, but when I do not have food I contact my family and ask food, they really help me to eat" (Interviewee 7, 2017). Additionally, Thumbelani (61) explained how he acquires his food by saying:

> *I make saving from part-time jobs. That money helps me to cover other groceries since I receive free vegetables from Love2Give. I ask the family to help when I do not have any, sometimes I go live at my friend's place and eat* (Interviewee 4, 2017).

These statements indicate that cultivators use family support as the last option to consider when securing food. Moreover, household demographics contribute to household food security through family members working elsewhere for extra income. Conversely, Luvuyo

indicated that he has not had any situation of food shortage due to his ability to predict coming food shortages. He explained that "I have not had a situation where I run out food at home because I predict the situation then make sure I have enough food and I also highly depend on the Love2Give urban garden for food security at home" (Interviewee 5, 2017). This participant used the family connection as a way to avoid shocks and stress by planning and mitigating where to get the next food before the current food ends. He also indicated that Love2Give provides the majority of his household food security since Love2Give gives to the families with children some extra groceries such as bread and butter. According to Walsh and Van Rooyen (2015), not having family support might lead to a negative consequence. For example, Nokulunga said that "I do not know how I would have eaten if my family was not helping me during the tough times" (Interviewee 1, 2017).

5.9. Challenges of Urban Agriculture

The identification of UA challenges is vital for future improvement. The key semi-structured interviews and surveys inquired about the challenges of UA in Kayamandi settlement discovered multiple challenges, including water shortages, drought, lack of access to land, water pipes as well as lack of enough seeds and plants. This section will be highlighting the constraints and challenges that urban farmers in Kayamandi encounter.

Water: Water is a fundamental resource for human survival, it is also crucial to life, food production as well as the environment. According to the Stellenbosch Municipality (2015), 95.5% of its residents have access to water. However, due to the drought that hit the Western Cape Province, the majority of the responses from Love2Give garden considered lack of water as the biggest challenge that threatens their farming. Nokulunga explained that "water is our biggest challenge because we are using tap water with restricted rules. The municipality shuts down the water and when there is no water we cannot water our plants" (Interviewee 1, 2017). As the participant stressed, the water shortage is linked with the portable municipal water, which can create water shortages in the area. Additionally, Zolile added that "water is the biggest challenge, this could be the worst time you could ask this question" (Interviewee 1, 2017). The timing of the interviews could be a major factor since the interviews were conducted in critical times. Therefore, the finding suggests that water is a major challenge in Kayamandi as Azola noted: "we do not even have water to drink let alone water to plant our garden" (Interviewee 3, 2017).

Land: Land is a big issue in South Africa. In cities, there are limited spaces for urban farming due to the urban setting which does not accommodate urban agriculture spaces. Also, the lack of access to land and/or insecure tenure prevents many urban residents from actively participating in farming in growing food in urban areas (Schulschenk, 2009). In Kayamandi the findings demonstrate that lack of enough spaces limits the farmer's ability to produce more. For instance, Thembelani said that "we farm a school backyard garden. The vegetables and food I get from Love2Give helps, but I believe if I had my own space I could also produce more vegetables and sell, what we get here does not exceed household consumption" (Interviewee 4, 2017). This indicates that farmers would have earned extra income if they had their own land. Likewise, Sizwe noted that "One challenge we all face is that we all landless are dependent on Love2Give gardens, the place is overcrowded and everyone wants to farm and get free food baskets, but space is limited" (Interviewee 6, 2017).

Farm equipment: without farm equipment and accessibility, farmers cannot be productive. In Kayamandi, farmers mentioned that lack of seeds, plants, water pipes as well as lack of skills hampered their productivity. For example, Zimasa said that "I am only here for 6 months, therefore, I do not know much about farming, I am getting there, and my skills are getting better" (Interviewee 7, 2017). The finding indicates that a lack of skills can be a big challenge for farmers. Similarly, Sizeka explained further that "we do not have enough seeds and plants to produce more, the little we plant is dying because of too much sunlight, I think the drought is affecting us and there is not enough water (Interviewee 9, 2017).

Generally, urban cultivators encounter numerous challenges including the above-mentioned problems. However, with proper skills and support for cultivators, they could produce more food and become self-sufficient. In this study, the findings suggest that the participants heavily depend on Love2Give, which creates a dependency syndrome. Through asset, building cultivators could reach their potential to access the capital pentagons and hence become food secure households.

5.10. Chapter summary

In summary, participants viewed UA as one of the important livelihood strategies that they use to pursue their livelihood outcomes and reduce their food insecurity. Lack of formal jobs, food and, economic hardships are the main motivators of that force the urban dwellers to engage UA. This chapter presented and discussed the empirical data through answering the research questions. The findings of this study suggest that UA contributes to household food

security in Kayamandi. The chapter presented the data through utilising graphs while quoting statements and linking the data with existing literature. Finally, the following chapter will conclude the findings and suggest some policy recommendations.

CHAPTER SIX: RECOMMENDATIONS AND CONCLUSIONS

6.0 Introduction

The study looks at the role that urban agriculture plays in promoting food security in Kayamandi, Stellenbosch. This chapter gives summary of the findings of the study, which will have sub-heading in reflection the research objectives. Furthermore, the chapter indicates the limitations of the study, provides some recommendations and suggests areas for further research.

6.1. Summary of the findings

6.1.1. Food security, UA, and livelihoods

The study used the Household Food Insecurity Access Scale (HFIAS) to measure the food security access of Love2Give beneficiaries. In Kayamandi, the study found that only 33.3% of the sample are food secure followed by 33.3% who are moderately food insecure and 33.3% who are severely food insecure. The reason the majority of the participants are either moderately or severely food insecure can be linked to the socio-economic situation of the Kayamandi residents. According to the Stellenbosch municipality (2014), the area encounters multiple challenges such as high levels of poverty, unemployment, and food insecurity. Similarly, Haysom (2011) stated that some parts of the Stellenbosch municipality (Black and Coloured dominated area) are facing food insecurity.

Moreover, the cross-tabulation of education and food security showed that 33.3% of households that are food secure have higher qualifications than those with lower education levels. This indicates the role that education can play to reduce food insecurity. Those with higher education were likely to diversify their income through part-time jobs. The FAO (2005) stated that education increases productivity, employability and creates job opportunities, which subsequently affect the lives of the poor people.

As migration becomes a global trend, 50% of the participants in this study migrated from rural areas to Cape Town. This is a clear indication that migration from rural areas to cities is a global phenomenon. People are escaping unemployment and poverty that exists in rural areas. However, moving from rural to urban does not guarantee a better life. As the findings of this study indicate a number of participants solely depend on Love2Give for support. These people lack skills, education and the capacity to find jobs and create a meaningful life.

In addition, these Love2Give beneficiaries source their food in different ways. 33.3% sourced their food from Love2Give while 25% and 16% source their food from neighbours and friends, respectively.

Furthermore, UA plays an important role in improving the food security situation in Kayamandi. A number of participants such Sizwe, Sizeka, and Philiswa stated that UA contributes to their household food security through receiving food baskets from Love2Give after harvesting. The organisation encourages the participants to engage in urban gardening in order to receive the benefits. The cultivators have to be interested in gardening in order to qualify to receive a food hamper. Additionally, participants attested to urban gardening as a way of increasing household nutritional intake. Battersby (2011) stressed that poor urban dwellers struggle to access nutritional food. Similarly, scholars (Battersby, 2016; Thornton and Nel, 2007) stress that UA alleviates poverty, improves food and nutrition security and generates income for poor households.

Although there are various livelihood strategies which Love2Give gardeners practice (e.g. social grants, business and seeking family support), gardening has become one major livelihood strategy which participants deploy to diversify their livelihoods. 75% of the participants engage in urban gardening for consumption purpose while 16.6% and 8.3% engage for income and physical well-being, respectively. The literature supports that gardening improves the condition of the poor and vulnerable communities (Kelly & Schulschenk, 2011; Galhena et al., 2010 and Poulsen et al., 2015).

Likewise, business is another alternative that contributes to the lives of the poor. The participants viewed conducting informal business as a way of improving their income hence increasing their household food security. The vegetables that participants receive does not exceed consumption and therefore cannot be sold. However, some participants engage in other methods of business (e.g. selling meat on the street) to increase their income. Battersby and Haysom (2018) noted street vending as an important livelihood strategy, which created employment opportunities and contributed to food security.

Social grants play an integral part in the reduction of food insecurity and alleviating poverty. As such, 8.3% of the participants viewed social grants as a livelihood strategy. However, this does not mean that the participants do not receive more social grants, rather, the structure of the questionnaires influenced the response of the participants in a sense that they had to choose which livelihood strategy is more important for them, and eventually selected

Love2Give support as a main livelihood strategy. Scholarly writing indicates that the role of social grants cannot be ignored as it provides social security for many struggling individuals (Gutura, 2013; Akinboade and Adeyefa, 2018).

In addition, the gardeners also stressed the challenges they face during their urban gardening. The fieldwork took place during the hot season when the Western Cape was facing a shortage of water, therefore a number of participants viewed lack of water as the biggest threat to their gardening. Some also indicated that because Love2Give provides one community garden, an adequate amount of land was one of their challenges. Additionally, farm equipment was another serious challenge that participants indicated. With more seeds, urban gardeners stressed they would have produced a larger quantity of vegetables.

6.1.2. Determinants of Urban Agriculture

The determinants of UA include the number of years that cultivators are involved in gardening, the reason for gardening, and how they use their harvest. The majority of the participants had been involved in UA for 1-3 years (84%) while (8%) had engaged for 5-6 years respectively. Only 8% had been involved in urban gardening for less than a year. The study focuses on those who engaged in urban farming for some time. The reason for the participants continuing to farm at Love2Give gardens can be attributed to the monthly benefits, which they received from the NGO. The organisation provides gardeners with sustainable livelihood skills such as training and workshops such as creating income-earning opportunities through training and mentorship programmes as well as providing food baskets. Webb (2011) argues that the commitment of cultivators is determined by the benefits they get from UA. Additionally, 75% of the participants are involved in farming for food purposes followed by 17% who engage in it for income. Only 8% of the participants engage in urban farming for other motivations such as exercise.

Galhena et al. (2013) noted that the majority of the farmers live in low-income areas. This means these communities feel excluded from the decision-making process such as sitting in the meetings whereby the municipality decides what project gets the priority, as a result, they seek help through urban gardening and interact with other fellow gardeners. Therefore, this is one way of diversifying their livelihoods, as they do not have other means to acquire income.

Although there are other UA activities (poultry, animal rearing, crop growing, and horticulture) with which urban gardeners could diversify their livelihoods, gardeners at the Love2Give garden stated that they only engaged in vegetable growing. The reason is that the

Love2Give garden produces only vegetable products such as cabbage, beetroot, and spinach. Additionally, vegetable production is only used for household consumption as they all indicated.

6.1.3. The role of Love2Give

Love2Give contributes both tangible and intangible assets. One of the main contributions from Love2Give is providing land for gardeners. This takes a burden off poor farmers as they lacked the opportunity to access to land. As both the literature and analysis chapters indicated, to access land, farmers have to be willing to farm. If the farmers fulfil this criteria, Love2Give will allow the cultivators access to the land and provide monthly food baskets. This is a clear indication of creating sustainable livelihoods and fighting against hunger as well as reducing food insecurity among the urban poor (Jacobs et al., 2003). Additionally, the organisation provides farm inputs such as farming equipment, seeds and plants. These are the main tangible assets that help the cultivators to produce food for their households.

Furthermore, the intangible assets include workshops, training, advice and creating connections and friendships. These assets are a direct product of the assumptions of the sustainable livelihood approach. The organization builds the human capital aspect of the participants through workshops and trainings. It also creates networking among farmers, which creates strong social capital within the community. Scholars indicate that NGOs can play an important role in building a sustainable community. Organisations such as Abalimi, Soil for Life and Love2Give have been active in promoting and building a sustainable urban agriculture environment in Cape Town, so as to reduce poverty and food insecurity (Olivier, 2015; Zezza, and Tasciotti, 2010; Battersby, 2011).

6.2. Recommendations

Throughout the study, the participants mentioned some of the pressing issues that need to be addressed. Although the study was undertaken during the crises in the Western Cape, the study suggests that the water system of the area should be improved since the cultivators were using the tap water. There have been huge water restrictions, which affected the productivity of the farmers. Love2Give in collaboration with local government need to come up with an urgent solution, such as digging wells, to assist the cultivators. This will help cultivators to plant efficiently and water their seeds to protect the sun to kill.

Additionally, the area in which cultivators were practicing UA was very small considering the number of people that were farming. The manager of the garden was worried about the size of the garden and the number of people. Therefore, the study recommends that Love2Give cooperate with stakeholders and demand land from the municipality. In this regard, the study noted that there was a disconnection between local government and cultivators which resulted in uninformed citizens. Thus, the local government should increase its public engagement and reach out to the most vulnerable communities.

Moreover, the study recommends that Love2Give should diversify its seeds and contribution to its beneficiaries. Cultivators indicated lack of enough seeds constrains their production. Providing the seeds during the right season also plays an important role in production. This would increase the level of production in the garden and therefore increase the level of food security in the area.

6.3. Limitations and further research areas

The study used a purposeful sampling method by selecting the beneficiaries of one particular organization (Love2Give). Therefore, the results cannot be generalized to the whole Kayamandi area. The researcher failed to hold focus group discussions due to language barriers. This study would have given more in-depth information from the cultivators in Kayamandi had focus group discussion been successful. The study used HFIAS as a tool to assess the current level of food security; however, the method gives the overall status of households food security but does not clearly indicate how the poor households utilize the little food they acquire. Since the study focuses on the role of UA on food security from the perspective of the organization's contribution, the research area the study would like to suggest is investigating the relationship between local government and urban dwellers as well as the role of NGOs in promoting UA in Kayamandi. This would have given a clear picture of the current food security in Kayamandi and the role organisations play promoting UA.

6.4. Conclusion

Food insecurity poses a great challenge to the urban dwellers in sub-Saharan Africa. In South Africa, it has been declared that the country is food secure. However, a number of studies have shown that food insecurity is prevalence in both rural and urban areas in South Africa. This study critically evaluated the impact of UA on food security using a case study of urban food gardens in Kayamandi settlement in Stellenbosch, Western Cape. The study found that UA plays a substantial role in reducing food insecurity in Kayamandi. Like other townships

in South Africa, Kayamandi residents face huge unemployment, poverty, and food insecurity. The cultivators in the study area solely depend on Love2Give and their life is uncertain due to insufficient food from the organisation. Therefore, it is imperative that both the government and NGOs work together in order to improve the lives of the vulnerable community in Kayamandi.

In conclusion, although the organisation positively contributes to household food security through asset building, there is a disconnection between the organisation, cultivators and the local government. This will also constrain community knows how to diversify their livelihood strategies in tough times.

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APPENDICES

Appendix A Research Instruments

Appendix A1: Household Questionnaire

INSTITUTE FOR SOCIAL DEVELOPMENT

UNIVERSITY OF THE WESTERN CAPE

PRIVATE BAG X 17

BELLVILLE, 7535

TEL: 021 959 3858

Dear Sir/Madam

Questionnaire for a study on the contribution of home based agriculture to food security

My name is Abdikarim Ahmed Salah and I am currently studying for a Master's Degree in Development Studies at the University of the Western Cape, Cape Town, South Africa. I am conducting a research project which seeks to critically evaluate the impact of urban agriculture on food security in reference to Kayamandi Settlement, Cape Town. I would greatly appreciate it if you would participate in this study by answering the questions in the attached research questionnaire. Please be assured that the findings of this study will be used for academic purposes only. The information you give will be treated with confidentiality and you are not required to write your name for the sake of maintaining anonymity. Participation in this study is voluntary and you can withdraw if you feel uncomfortable at any stage of the study.

Your time and patience in answering the questionnaire is much appreciated.

Mr. Abdikarim Ahmed Salah — Researcher

Dr A. Karriem — Supervisor

Household Questionnaire

Please tick the appropriate box.

SECTION ONE: BACKGROUND INFORMATION

S/N	Question	Reponses Categories	√	Codes
1	Migration History	Born in Kayamandi settlement		1
		Migrated from a town within the Western Cape		2
		Migrated from Eastern Cape		3
		Others, Specify		4
2	How long have you lived in Kayamandi?	Less than one year		1
		1-3 years		2
		4-6 years		3
		7-9 years		4
		10+Years		5
3	What is your gender?	Male		1
		Female		2

4	What is your age?	Less than 18 years	1
		18-24 years	2
		25-31 years	3
		32-38 years	4
		39-45 years	5
		46-52 years	6
		53-59 years	7
		60+years	8
5	What is your Marital status?	Single	1
		Married	2
		Widowed	3
		Separated or Divorced	4
6	What is your highest level of education?	No formal education	1
		Completed Primary	2
		Completed Ordinary Level	3
		Completed Advanced Level	5
		Completed Vocational Education	6
		Completed University	7
7	What is your current employment status?	Not employed	1
		Self-employed	2
		Employed	3
		Part- time employed	4
8	What is your main source of income?	Employment	1
		Relatives	2

		Government Grant	3
		NGO support	4
		Other specify:	5
9	What is your monthly come?	Below R1000	1
		Between R1000-R2000	2
		Between R2000- R3000	3
		Above R3000	4
10	What is your household's main source of food?	Buy from supermarkets/tuck shops	1
		Friends and relatives	2
		Neighbors	3
		NGOs	4
		Other specify:	5
11	Including yourself, how many people are in your household?	1-2	1
		3-4	2
		5-6	3
		More than 6	4

SECTION TWO: PRACTICE AND DETERMINANTS OF HOME -BASED AGRICULTURAL PRODUCTION

12	How long have you been practicing urban gardening?	Less than one year	1
		1-3 years	2
		4-6 years	3
		7-9 years	4
		10+Years	5

13	Why do you grow farm produce or engage home gardening?	As a main source of food for the household	1
		As main source of income/earning a living	2
		As extra source of income	3
		As an extra source of food for the household	4
		As a leisure activity or hobby e.g. gardening	5
14	What kind of agricultural activity are you involved in?	Poultry rearing e.g. chicken, quail	1
		Animal rearing e.g. cattle, goats	2
		Crop growing e.g. maize	3
		Vegetable growing	4
		Horticulture	5
15	How much of your produce do you sell?	All	1
		Half	2
		A quarter	3
15 a	How much did you earn for your home gardening production in the past year?	Below R500	1
		R500-R1000	2
		R1000-R2000	3
		R2000-R3000	4
		Above R3000	
16	If you sell, what do you use the money for?	Buy food	1
		Pay household utility bills	2
		Pay school fees	3

		Buy household assets	4
		Others specify…….....	5

SECTION THREE: HOUSEHOLD FOOD SECURITY (HFIAS adopted with few modifications)

17	In the past four weeks, did you worry that your household would not have enough food?	No **(Move to Question 23)**	0
		Yes	1
18	How often did this happen?	Rarely (once or twice in the past 4weeks	1
		Sometimes (three to ten times in the past 4weeks	2
		Often (more than ten times in the past 4 weeks)	3
19	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of food or resources?	No **(Move to Question 24)**	0
		Yes	1
19 a	How often did this happen?	Rarely (once or twice in the past 4weeks	1
		Sometimes (three to ten times in the past 4weeks	2
		Often (more than ten times in the past 4 weeks)	3
20	In the past four weeks, did you or any household member have to	No**(Move to Question 25)**	0
		Yes	1

	eat limited variety of foods due to a lack of resources?		
21	How often did this happen?	Rarely (once or twice in the past 4weeks	1
		Sometimes (three to ten times in the past 4weeks	2
		Often (more than ten times in the past 4 weeks)	3
22	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	No **(Move to Question 26)**	0
		Yes	1
23	How often did this happen?	Rarely (once or twice in the past 4weeks	1
		Sometimes (three to ten times in the past 4weeks	2
		Often (more than ten times in the past 4 weeks)	3
24	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	No **(Move to Question 27)**	0
		Yes	1
24 a	How often did this happen?	Rarely (once or twice in the past 4weeks	1
		Sometimes (three to ten times in the past 4weeks	2

		Often (more than ten times in the past 4 weeks)	3
25	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	No **(Move to Question 28)**	0
		Yes	1
25a	How often did this happen?	Rarely (once or twice in the past 4weeks	1
		Sometimes (three to ten times in the past 4weeks	2
		Often (more than ten times in the past 4 weeks)	3
25	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of food or resources to get food?	No **(Move to Question 29)**	0
		Yes	1
25a	How often did this happen?	Rarely (once or twice in the past 4weeks	1
		Sometimes (three to ten times in the past 4weeks	2
		Often (more than ten times in the past 4 weeks)	3
26	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	No **(Move to Question 30)**	0
		Yes	1
		Rarely (once or twice in the past 4weeks	1

26 a	How often did this happen?	Sometimes (three to ten times in the past 4weeks	2
		Often (more than ten times in the past 4 weeks)	3
27	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	No	0
		Yes	1
27 a	How often did this happen?	Rarely (once or twice in the past 4weeks	1
		Sometimes (three to ten times in the past 4weeks	2
		Often (more than ten times in the past 4 weeks)	3
28	What strategies do you adopt when your household experiences food insecurity (Food security coping strategies)?	Skip meals	1
		Grow own food	2
		Reduce food portions	3
		Sell property	4
		Borrow food	5
		Eat less preferred food	6
		Migration	7
		Other specify…….	8

SECTION FOUR: CHALLENGES

29		Water challenges	1
		Conflicts with neighbors	2

What are the challenges are you facing while conducting community gardening?	Limited skills	3
	Fear of arrest	4
	Financial challenges	5
	Other specify…….	6

30 What are you doing to address these challenges?

1……
……

2……
……

3……
……..

4……
……

5……
……..

Appendix A1: Community Garden Cultivators Interview guide

1. Why are you engaging in urban gardening?
    - How long have you been an urban gardening?
2. What are your other sources of livelihood?
3. What are you producing and how much?
    - How do you source your inputs?
4. How is urban agriculture making differences to your household food security?
    - What measures do you take to make sure that your household always has food?
5. Do you sell your produce, if yes to whom?
    - If you sell your produce, what do you use the money for?
6. What kind of support are you receiving from the local government and NGOs?
7. What would you like to see improved in your urban gardening activities?
8. What are challenges are you experiencing as an urban farmer?

Appendix A2:Key Informant Interview Guide

1. Why do people engage in urban gardening in Kayamandi?

2. How is urban agriculture production contributing to household food security in Kayamandi?

3. What are the guidelines in place to prevent health related hazards?

 How are the guidelines being implemented? Do urban gardeners comply with the city's guidelines? what are the measures taken to ensure that urban gardeners follow these guidelines?

4. What kind of support are you offering to the Home-based cultivators?

5. What are the challenges of urban farming in Bulawayo?

6. What can be done to ensure that poor people derive more benefits from practicing urban agriculture?

7. What are the policy measures taken to promote urban agriculture in Bulawayo?

Appendix B: STATA DO-FILE

Log using Kayamandisurvey.log

doed

//log using salah.log

rename Q1 migration

rename Q2 duration

rename Q3 Gender

rename Q4 Age

rename Q5 Marriage

rename Q6 Education

rename Q7 Employment

rename Q8 Income

rename Q9 Income2

rename Q10 FoodSource

rename Q11 household

rename Q12 UrbanAgriculture

rename Q13 ReasonToGarden

rename Q14 AgriculturalActivity

rename Q15 Garden

rename Q16 ForSale

rename Q17 substitution

rename Q27 coping

rename Q28 challenges

rename Q18 Q1

rename Q18a Q2a

rename Q19A Q2a

rename Q20 Q3

rename X Q3a

rename Q21 Q4

rename Q21A Q4A

rename Q22 Q5

rename Q22A Q5A

rename Q23 Q6

rename Q23A Q6A

rename Q24 Q7

rename Q24A Q7A

rename Q25 Q8

rename Q25A Q8A

rename Q26 Q9

rename Q26A Q9A

label variable migration "migration history"

label define Migration 1 "Born in Kayamandi" 2 "Migrated from other town" 3 "Migrated from a rural area" 4 "Others Specify"

label variable duration "how long have you lived in Kayamandi"

label define duration 1 "Less than one year" 2 "1-3 years" 3 "4-6 years" 4 "7-9 years" 5 "10+ years"

label variable Gender "Sex"

label define Gender 1 "Male" 2 "Female"

label variable Age "What is your Age"

label define Age 1 "less than 18 years" 2 "18-24 years" 3 "25-31 years" 4 "32-38 years" 5 "39-45 years" 6 "46-52 years" 7 "53-49 years" 8 "60+ years"

label variable Marriage "Marital status"

label define Marriage 1 "Single" 2 "Married " 3 "Widowed" 4 "Separated or Divorced"

label variable Education "Level of Education"

label define Education 1 "No formal education" 2 "Completed Primary" 3 "Completed Ordinary Level" 4 "Completed Advanced Level" 5 "Completed Vocational Education" 6 "Completed University"

label variable Employment "Employment Status"

label define Employment 1 "Not employed" 2 "Self-employed" 3 "Employed" 4 "Part-time Employed"

label variable Income "source of Income"

label define Income 1 "Employment" 2 "Relatives" 3 "Government Grants" 4 "NGO Support" 5 "Others Specify"

label variable Income2 "Monthly Income"

label define Income2 1 "Below R1000" 2 "Between R1000 and R2000" 3 "Between R2000 and R3000" 4 "Above R3000"

label variable FoodSource "H.H Main source of food"

label define FoodSource 1 "Friends and Relatives " 2 "Neighbors" 3 "NGOs " 4 "Others Specify"

label variable household "H.H. Size"

label define Household 1 "1-2" 2 "3-4" 3 "5-6" 4 "More than 6"

label variable UrbanAgriculture "How long have you been practicing AU"

label define UrbanAgriculture 1 "Less than one year" 2 "1-3 years" 3 "4-6 years" 4 "7-9 years" 5 "10+ years"

label variable ReasonToGarden"why are you engaging UA"

label define ReasoToGarden 1 "food" 2 "Income" 3 "Others Specify"

label variable AgriculturalActivity "what kind of other agr-activity are involved?"

label define AgriculturalActivity 1 "Poultry rearing e.g. Chicken, quail" 2 "Animal rearing e.g. cattle, goats" 3 "Crop growing e.g. naize" 4 "Vegetables" 5 "Horticulture"

label variable Garden "what do you do with produce?"

label define Garden 1 "Sell" 2 "Use for Household Consumption" 3 "Both" 4 "Others Specify"

label variable ForSale "how of your produce do you sell?"

label define ForSale 1 "All" 2 "Half" 3 "A Quarter" 4 "None"

label variable substitution "if you sell, what do do with money?"

label values migration Migration

label values duration duration

label values Gender Gender

label values Age Age

label values Age Age

label values Marriage Marriage

label values Education Education

label values Employment Employment

label values Income Income

label values substitution substitution

label values FamilyIncomeFamilyIncome

label values FoodSourceFoodSource

label values household household

label values UrbanAgricultureUrbanAgriculture

label values ReasonToGardenReasonToGarden

label values AgriculturalActivityAgriculturalActivity

label values Garden Garden

label values ForSaleForSale

label values substitution substitution

label values Q1 FoodSecurity

//Generating the score

generateHFIASscore=(Q1a+Q2a+Q3a+Q4a+Q5a+Q6a+Q7a+Q8a+Q9a)

//Generating HFIAS categories

generateHFIASscoreR=.

generateHFIASscoreX=

replaceHFIASscoreX=1 if Q1a==0 | Q1a==1 & Q2==0 & Q3==0 & Q4==0 & Q5==0 & Q6==0 & Q7==0 & Q8==0 & Q9==0

replaceHFIASscoreX=2 if Q1a==2 | Q1a==3 | Q2a==1 | Q2a==2 | Q2a==3 | Q3a==1 | Q4a==1 & Q5==0 & Q6==0 & Q7==0 & Q8==0 & Q9==0

replaceHFIASscoreX=3 if Q3a==2 | Q3a==3 | Q4a==2| Q4a==3| Q5a==1 | Q5a==2 | Q6a==1 | Q6a==2 & Q7==0 & Q8==0 & Q9==0

replaceHFIASscoreX=4 if Q5a==3 | Q6a==3 | Q7a==1 | Q7a==2 | Q7a==3 | Q8a==1 | Q8a==2 | Q8a==3 | Q9a==1 | Q9a==2 | Q9a==3

****Generating with brackets

replaceHFIASscoreX=1 if (Q1a==0 | Q1a==1) & Q2==0 & Q3==0 & Q4==0 & Q5==0 & Q6==0 & Q7==0 & Q8==0 & Q9==0

replaceHFIASscoreX=2 if (Q1a==2 | Q1a==3 | Q2a==1 | Q2a==2 | Q2a==3 | Q3a==1 | Q4a==1) & Q5==0 & Q6==0 & Q7==0 & Q8==0 & Q9==0

replaceHFIASscoreX=3 if (Q3a==2 | Q3a==3 | Q4a==2| Q4a==3| Q5a==1 | Q5a==2 | Q6a==1 | Q6a==2) & Q7==0 & Q8==0 & Q9==0

replaceHFIASscoreX=4 if Q5a==3 | Q6a==3 | Q7a==1 | Q7a==2 | Q7a==3 | Q8a==1 | Q8a==2 | Q8a==3 | Q9a==1 | Q9a==2 | Q9a==3

use "C:\Users\Ak\Desktop\sTATA AK\re-editeddta.dta", clear

egenavgscore= mean (HFIASscore)

HFIASscore=.

gHFIASscore=.

generateHFIASscore=(Q1a+Q2a+Q3a+Q4a+Q5a+Q6a+Q7a+Q8a+Q9a)

sumHFIASscore

desHFIASscore

tabHFIASscore

des

dropHFIASscore

gHFIASscore=.

sum coping

tab coping

label define coping 1 "skip meals" 2 "Grow own food" 3 "Reduce food portions" 4 "Sell property" 5 "Borrow food" 6 "Eat less preferred food" 7 "Migration" 8 "Other Specify"

label define challenges 1 "Water challenges" 2 "Conflict with neighbors" 3 "Limited skils" 4 "Financial challenges" 5 "Other Specify"

gHFIASsoreR= (Q1a+ Q2a+ Q3a+ Q4a+ Q5a+ Q6a+ Q7a+ Q8a+ Q9a)

gHFIACat=.

replaceHFIACat=1 if Q1a==0 | Q1a==1 & Q2==0 & Q3==0 & Q4==0 & Q5==0 & Q6==0 & Q7==0 & Q8==0 & Q9==0

replaceHFIACat=2 if Q1a==2 | Q1a==3 | Q2a==1 | Q2a==2 | Q2a==3 | Q3a==1 | Q4a==1 & Q5==0 & Q6==0 & Q7==0 & Q8==0 & Q9==0

replaceHFIACat=3 if Q3a==2 | Q3a==3 | Q4a==2| Q4a==3| Q5a==1 | Q5a==2 | Q6a==1 | Q6a==2 & Q7==0 & Q8==0 & Q9==0

replaceHFIACat=4 if Q5a==3 | Q6a==3 | Q7a==1 | Q7a==2 | Q7a==3 | Q8a==1 | Q8a==2 | Q8a==3 | Q9a==1 | Q9a==2 | Q9a==3

tab migration

tab Gender

tab Marriage

tab Education

tab Employment

tab Income

tabFamilyIncome

tabfood_source

tab household

tabReasonToGarden

tab Garden

tab challenges