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Home-based agricultural production as a food security coping strategy for urban households: A case of Bulawayo, Zimbabwe.

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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Abstract

Urban food insecurity in Zimbabwe is a serious stumbling block to the attainment of sustainable urban livelihoods. The casual factors of the urban food crisis in the country include widespread poverty, an unstable economic environment, a reduction of viable employment opportunities and climate-related shocks. The cash-based nature of urban livelihoods, coupled with the economic crisis in Zimbabwe has generated a serious challenge for urban households as basic food prices have increased to such an extent that most urban dwellers experience difficulties in purchasing food. In a context of high poverty and unemployment, urban agriculture has emerged as a food security and livelihood diversification strategy for many poor urban households. Whilst there is a growing body of literature focusing on urban agriculture in Zimbabwe, it has largely focused on community and allotment gardens. There has, however, been little empirical investigation of home-based (or backyard) agricultural production. While backyard gardens have always existed, they have grown in response to poor economic conditions and adverse livelihood conditions. The Bulawayo Municipal Council Agriculture Policy has facilitated this expansion, especially the growth of poultry production. This study addresses this gap in the literature by investigating the contribution of home-based agricultural production in promoting household food security and livelihoods in Bulawayo. A mixed methods approach was utilised for the purposes of the study. In the quantitative part of the study, 99 households were randomly sampled whilst 10 purposively sampled interviews with urban farmers, 3 key informant interviews and 1 focus group discussion were employed for the qualitative part of the study. The Sustainable Livelihoods Framework, which was used as a theoretical framework of the study, helped to unpack the various livelihood diversification strategies and asset portfolios that poor people depend on for their well-being. Contrary to our initial assumption, the results of the study revealed that 71 percent of the households in the study area were food secure. The findings of the study reveal that home-based urban agriculture is an important food security coping strategy in Bulawayo. The high levels of food security in Bulawayo should however, not be solely attributed to the practice of urban agriculture as 75 percent of the respondents bought their food from supermarkets and other shops. Urban agriculture thus plays a complimentary role to household food security in Bulawayo. In the face of high unemployment and underemployment in Bulawayo, home gardening contributes to livelihood diversification through increasing the availability of household disposable income. In this study, the average income gained from UA ranged from US$200 to US$300 per month for poultry farmers and about US$20 to US$50 per month for vegetable producers. While the income gained from the sale of surplus vegetables may

seem little, it, however, makes a significant contribution to urban livelihoods, especially if it is coupled with other livelihood strategies. The potential of home-based urban agriculture to fully contribute to urban household food security and livelihoods is, however, limited by water and financial challenges, policy irregularities, weak or non-existent extension services, and limited skills. There is a need for collective responsibility by various stakeholders such as the government, city authorities and NGOs to strengthen the practice of urban agriculture as this can help to reduce the food security and livelihood challenges experienced by the growing urban populations in Bulawayo in particular and Zimbabwe in general.

Keywords
Urban agriculture

Home based agricultural production

Livelihoods

Food security

Coping strategies

Sustainable Livelihoods Approach

Home food gardens

Poverty

Bulawayo

Zimbabwe

Declaration

I declare that *Home-based agricultural production as a food security coping strategy for urban households: A case of Bulawayo, Zimbabwe* is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Metron Ziga

Signed……

May 2018

Dedication

This work is dedicated to all people who are striving to improve the livelihoods of urban dwellers.

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Abbreviations and Acronyms

AGRITEX	Agricultural Technical and Extension Services (AGRITEX)
BCC	Bulawayo City Council
CFS	Committee on World Food Security
DFID	Department for International Development
ESAP	Economic Structural Adjustment Programme
FAO	Food and Agriculture Organization
HBA	Home-based Agriculture
HFIAS	Household Food Insecurity Access Scale
IMF	International Monetary Fund
IRD	Integrated Rural Development
NGOs	Non-Governmental Organizations
PRA	Participatory Rural Appraisal
RRA	Rapid Rural Appraisal
SLA	Sustainable Livelihoods Approach
SLF	Sustainable Livelihoods Framework
UA	Urban agriculture
UN	United Nations
UNDP	United Nations Development Programme
UPA	Urban and Peri-urban agriculture
USD	United States Dollar
WFP	World Food Programme
WFS	World Food Summit
ZIMSTAT	Zimbabwe National Statistics Agency
ZIMVAC	Zimbabwe Vulnerability Assessment Committee

Table of Contents

List of Tables

Table of Figures

CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1 Overview and rationale of the study

Food insecurity continues to be a stumbling block to the well-being of households and communities across the world. It is estimated that about 795 million people (i.e. one in nine people) worldwide do not have enough food to lead healthy and active lives (World Food Programme, 2017). Cities in Africa, particularly in sub-Saharan Africa, are growing at an exceptional rate and it is expected that by the year 2030 more than half of the African population will be urban dwellers (Crush et al, 2011; United Nations, 2016). Urban food insecurity has traditionally been overlooked due to the emphasis on food insecurity being a rural phenomenon. However, food insecurity in African cities has increased as a result of soaring food prices, global economic recessions and poor macroeconomic policies (Crush et al, 2010; Kutiwa et al, 2010). In Zimbabwe, at the peak of the 2017 lean season, 4.1 million people were estimated to be food insecure (WFP, 2017). Food insecurity in Zimbabwe is attributed to widespread poverty, limited employment opportunities, economic instability, and recurrent climate-induced shocks (Tawodzera et al, 2016; WFP, 2017). Zimbabwe's urban dwellers are experiencing an increase in food insecurity due to high costs of living in Africa's urban areas, which are 30 per cent higher as compared to rural areas (Frayne et al, 2009). Urban food accessibility is determined by the availability of income. The poor in urban areas do not only purchase food; they also have to pay for water and electricity bills, pay school fees and transport, which can be a challenge for low income earners who are vulnerable to food insecurity as a result of the cash based nature of urban economies.

Urban agricultural production has emerged as a possible livelihood diversification strategy which has the potential for alleviating urban problems, especially unemployment and food insecurity. Urban agriculture is acting as a food security adaptation strategy in the face of rapid urbanization and its accompanying problems. Urban agriculture can exercise an important role in realising sustainable urban livelihoods as it proffers benefits of increasing household incomes, urban food and nutrition security as well as recycling urban waste water to ensure environmental sustainability (Halweil and Nierenberg, 2007; Korthwright and Wakefield, 2011; Moyo, 2013; Jongwe, 2014). This study investigated the role that urban agriculture plays addressing urban

food insecurity and diversifying livelihoods in the Zimbabwean context, particularly in Bulawayo.

Urban households engage in three types of urban cultivation, namely, community, allotment, and home gardening as they seek to improve their well-being. Community gardening refers to a piece of land farmed by a group of people on shared or individual plots primarily for self-consumption whereas allotment gardens are described as separate parcels of land allocated to individuals or households for their personal use (Sithole, 2008). By contrast, home gardens are pieces of land cultivated by individuals or households who have access to land in their home or near their home (Drescher, 2006). These are also referred to in literature as backyard gardens, house lot gardens or kitchen gardens (Korthwright and Wakefield, 2011). Despite the growing literature on the role of urban agriculture and how it can be integrated into urban planning, little focus has been placed on home-based urban agricultural production as it relates to crop cultivation and small livestock husbandry.

The literature on urban agriculture in Zimbabwean cities has largely focused on community and allotment gardens. However, the convenience and safety of home-based agricultural production makes it an important livelihood strategy that people can practice simultaneously with other livelihood strategies. Livelihood diversification through engaging in home-based agricultural production is pivotal in contributing to improved livelihood outcomes such as increased household well-being. The motivations of people who practice home-based agriculture in Bulawayo, their characteristics and their livelihood strategies, are not well-known. The realisation of the role played by urban agriculture in urban livelihoods thus provided a compelling reason to investigate the state of home-based agricultural production in Bulawayo. More specifically, this study investigated the extent to which urban agriculture, particularly home-based agricultural production, acts as a food security and livelihood strategy. The study also examined the determinants of household participation in home-based agricultural production. The findings of this study enable an understanding of possible urban livelihood diversification interventions that can improve the well-being of urban households.

1.2 Background and contextualization of the study

Zimbabwe is a country that is bedeviled by numerous socio-economic challenges which negatively impact on the well-being of the population. The country has 72% of its population

living in chronic poverty (UNOCHA, 2016). Poverty in Zimbabwe is no longer a rural phenomenon as there has been an increase in the number of urban dwellers who live below the Poverty Datum Line of $US430, $574 for an average household of 5, and $96 for a self-sustaining individual (ZimStats, 2016). The increase in urban poverty dates as far back as the early 1990s when the government introduced the IMF and World Bank-led Economic Structural Adjustment Programme which was accompanied by massive retrenchments and loss of livelihoods. The already dire economic situation was further exacerbated by poor macroeconomic policies, which have been accompanied by a massive de-industrialization of the economy, hyperinflation (which led to the abandonment of the Zimbabwean dollar in 2009) and political upheavals (Kutiwa et al, 2010; Tawodzera et al, 2016). The growth of urban poverty in Zimbabwe has been accompanied by an increase in urban food insecurity. Studies conducted by the Zimbabwe Vulnerability Action Committee (ZIMVAC, 2009) reveal that urban food insecurity increased from 24% to 33% between 2006 and 2009, respectively. The situation in Zimbabwe remains dire due to the continued economic crisis and high unemployment rates.

Zimbabwe, which used to be the breadbasket of Southern Africa, has been turned into a nation that is now dependent on the import of maize and other food products. This has generated a serious challenge for urban households as basic food prices have increased to such an extent that most urban dwellers experience difficulties in purchasing food. Zimbabwe's economic crisis and resultant food price inflation has forced many urban dwellers to turn to urban agriculture as a food security coping strategy (Kutiwa et al, 2010; Moyo, 2013; Pedzisai et al, 2014). Urban agriculture has been intensifying as households seek to adapt to the unstable economic environment, which is threatening the sustainability of urban livelihoods. Smart et al (2015) contend that in cases of extreme economic hardship and crisis, urban agriculture plays an important role in promoting household adaptation and coping. This is linked to the arguments of resilience theory, which stipulates that the lack of an economic and employment mainstay is a catalyst for alternate livelihood strategies (Dawley et al in Smart et al, 2015).

The rapid growth of home-based urban agricultural production in Zimbabwe has been witnessed through anecdotal evidence and personal observations. For example, Halweil and Nierenberg (2007) reported that in Harare more than a third of households keep chickens, ducks, pigeons, rabbits and turkeys while Dhewa (2015) reports that urban households in Zimbabwe's major cities rear broiler chickens, turkey, rabbits and quail birds for both subsistence and commercial

production. Dhewa (2015) further points out that the commercial side of agro-processing is supporting the growth of informal agricultural markets as caterers and vendors are procuring processed meat, dried vegetables, and fruit juices from urban farmers. This growth in urban agriculture has been promoted by both national and local government's recognition of the instrumental role played by urban agriculture in the livelihoods of urban people. This recognition by different levels of government and NGOs has been pivotal in the promulgation of Municipal policies regulating urban agriculture (Moyo, 2014). Urban agricultural supportive Municipal policies have contributed to the unprecedented growth of the livelihood strategy in urban areas of Zimbabwe. The Bulawayo Urban Agriculture Policy, for example, allows people in high-density suburbs to rear a maximum of 25 chickens/ducks/pigeons and 15 rabbits whereas low-density dwellers are allowed a maximum of 200 birds and 30 rabbits (Bulawayo City Council, 2008). These favorable policies have been instrumental in facilitating the growth of home-based agricultural production in Bulawayo.

1.3 Bulawayo: The Case Study area

Bulawayo is the second largest city in Zimbabwe with a population of 653,337 (ZimStats, 2012). The city is a manufacturing and industrial center which is characterized by the existence of a number of heavy industries which have been deteriorating and underperforming as a result of poor economic policies and an unconducive investment climate (Parliament of Zimbabwe, 2011). The city has been facing massive de-industrialization which has contributed to high unemployment rates and massive migration to neighboring countries, especially South Africa, Botswana and Zambia. The livelihood strategies used by people from Bulawayo include cross-border trading which is promoted by the close proximity of the city to the borders of South Africa, Botswana and Zambia. Research on home-based urban agriculture in Bulawayo is limited as compared to other Zimbabwean cities. This provided a compelling reason for the researcher to choose the city as the case study area.

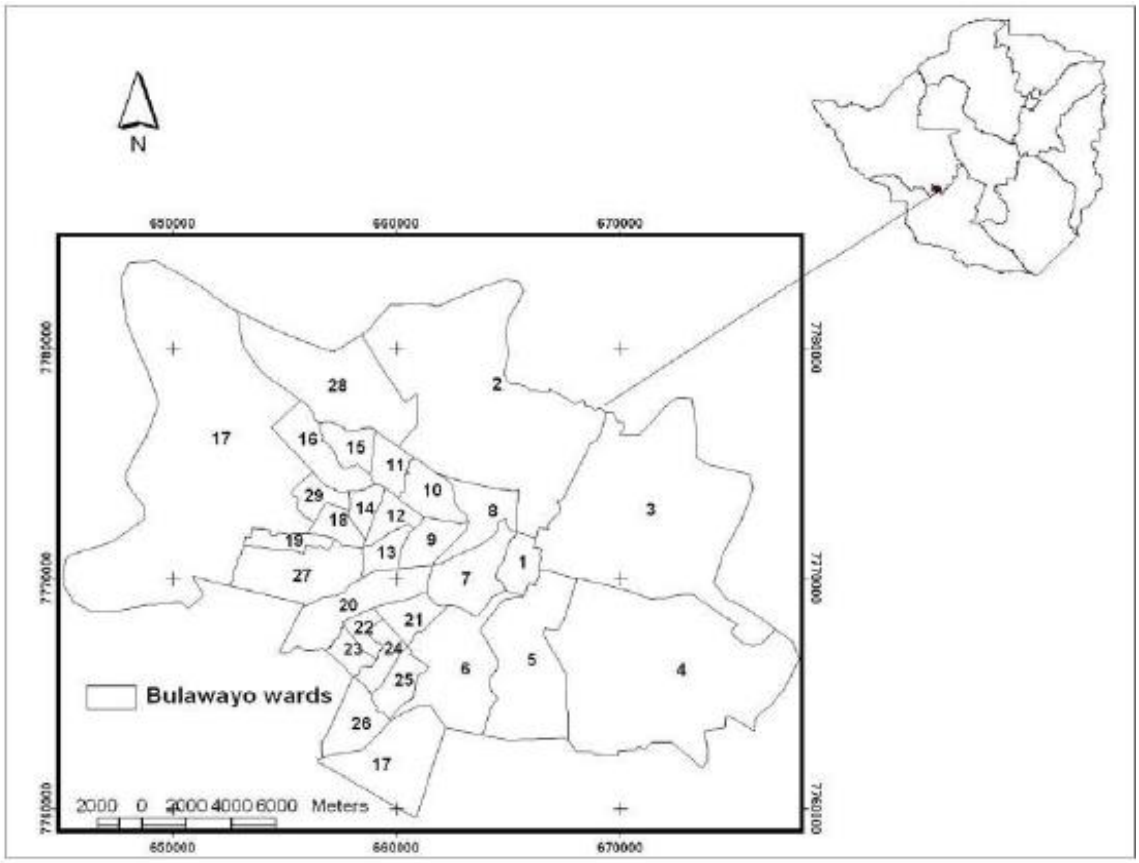
The poverty prevalence rate in Bulawayo is 37.2%, which is lower than most rural areas (ZimStats, 2015). The study focused on one high-density suburb in Bulawayo: Ward 28, also known as Cowdray Park (see fig 1.2). Mpofu (in Sebata et al 2014:129) argues that high-density suburbs are characterised by an average number of 6 people surviving on about US$200 per month, while the country's poverty line is US$430 and an estimated of 80% of high-density

households are reported to be food insecure. Cowdray Park ward has the second highest poverty prevalence rate of over 40 percent in Bulawayo despite the fact that it is a relatively new high-density suburb (ZimStats (2015). The residents in this high-density suburb are mostly low-income earners who depend on livelihood strategies such as informal trading and employment in the civil service sector.

Fig 1.1: Map of Zimbabwe

Source: Gateway Africa (2018)

Fig 1.2: Map of Bulawayo Metropolitan and its wards



Source: Sebata et al (2014)

1.4 Problem statement, Research questions, Aim and Objectives of the study

1.4.1 Problem Statement

Research on urban agriculture has been increasing due to its promises of promoting sustainable urban livelihoods. Urban agriculture studies have focused on its contribution to household food security, poverty alleviation and income generation (Crush et al, 2011; Arku et al, 2012; Pedzisai et al, 2014; Jongwe et al, 2014 ; Kutiwa et al, 2010; Mthethwa, 2012; Moyo, 2013). Possibilities of integrating urban agriculture into urban planning for sustainable and resilient cities have also been areas of study (Tornyie, 2011; Zeeuw *et al*, 2011). However, studies on home-based (on-plot) agricultural production, particularly in relation to small-animal husbandry, are limited. Kortright and Wakefield (2011) and Mrema and Chitiyo (2011) conducted home-gardening studies, however, they did not consider small livestock rearing despite studies by Madalenol (2000) which reveal that urbanites have traditionally raised poultry as well as other animals. It is

against this backdrop that this study sought to assess the contribution of home-based agricultural production (animal husbandry and crop production) to the food security and livelihoods of urban households in Bulawayo.

Urban households adopt various food security coping strategies to ensure that they do not run out of food in times of crisis. This is particularly true in Zimbabwe which is characterised by a volatile economic environment. Little is known about the food security coping strategies that urban households in Bulawayo adopt to minimise the negative impact of macroeconomic instability. Studies have placed more focus on rural food security coping strategies despite the fact that a growing number of urban households are equally vulnerable to food insecurity (Bird et al, 2000; Senefeld and Polsky, 2005). It is, however, noteworthy that few studies have attempted to investigate urban household food security coping strategies and their synergies with urban agriculture, particularly in Bulawayo, Zimbabwe. This study, therefore, unraveled the food security coping strategies that households in Bulawayo adopt and their link to urban agriculture.

1.4.2 Objectives of the study

This research sought:

1. To explore the contribution of home-based agricultural production in promoting household food security and livelihoods in Bulawayo.
2. To analyse the determinants of household participation in home-based agricultural production.
3. To examine the factors which hinder the growth and full contribution of urban agriculture to urban household food security.

1.4.3 Research questions

1. What is the contribution of home-based agricultural production to urban household food security and livelihoods in Bulawayo?
2. What are the determinants of household participation in Home-based agricultural production?

3. What are the factors which hinder the growth and contribution of urban agriculture to urban household food security?

1.4 Structure of the thesis

This research study is organized into six chapters. **Chapter one** is the introductory chapter of the study. The chapter highlights the background and contextualization of the research problem, objectives and questions.

Chapter two focuses on the review of relevant literature on urban agriculture. The literature reviewed is divided into subheadings derived from the major themes and trends in urban agriculture. The gaps and contradictions in urban agriculture literature were also analysed in this chapter.

Chapter three focussed on the Sustainable Livelihoods Framework which is the theory underpinning this study. The theory was analysed and linked to the study in order to come up with answers to the research problem.

Chapter four clearly outlines the research methodology which was employed in this study. The chapter explains and justifies the research design, population and sampling techniques which were implemented in order to answer the research questions.

Chapter five covers the data analysis, the presentation and discussion of the findings of the research. The quantitative and qualitative data were analysed and presented sequentially.

Chapter six is a conclusion to the study. Recommendations and areas for further research are proffered. The recommendations and areas for future research are informed by the findings of the study.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

The literature on urban agriculture has been increasing as a result of growing interests on its potential to solve or ameliorate urban problems such as food insecurity and poverty. This chapter appraises the literature on urban agriculture. The historical development of the concept of food security is traced followed by an analysis of the nature of urban food insecurity. The chapter establishes the nexus between urban agriculture, food security and sustainable urban development. The literature on the characteristics of urban farmers, the typologies of urban gardens, and the motivations behind the practice of urban agriculture are also appraised. The policy and legal frameworks regulating urban agriculture in Zimbabwe are reviewed. Finally, the challenges associated with the practice of urban agriculture are highlighted before the summary of the chapter.

2:1 Food Security: The evolution of the concept

Interest in food security can be traced as far back as 1943 to the Hot Springs Conference of Food and Agriculture (Committee on World Food Security (CFS), 2012). The 1943 Conference reached a consensus on food security as "secure and adequate food supply for everyone" (Napoli, 2011:7). Bilateral agencies established by donor countries (e.g. The USA and Canada) in the 1950s were to ensure food security in poor countries. However, this was abandoned in the 1960s after a realisation that food aid hampered the self-sufficiency capabilities of the recipient countries and led to a dependency syndrome (Weingärtner, 2004). In 1966 the United Nations adopted the International Covenant on Economic, Social and Cultural Rights, which stipulated that states had to take measures "to improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition…" and "…to ensure an equitable distribution of world food supplies in relation to need" (CFS, 2012:7). This gave birth to the concept of Food for Development which was institutionally expressed through the World Food Programme.

The era of Food for Development was followed by 'food assurance' which came as a result of the 1972-4 food crisis. Food assurance was characterised by insurance schemes set up to ensure access to food supplies leading to enhanced donor coordination and improved monitoring in food

aid recipient countries (Napoli, 2011). The food security concerns of the 1970s were based on the premises that guaranteeing food availability and food prices would result in food security. Resultantly, at the World Food Conference of 1974, food security was defined as the "…availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices" (FAO, 2006). The failure of the Green Revolution to eradicate food insecurity made it clear that food insecurity does not only hinge on the unavailability of food but also the inability of the poor to access or purchase food (Weingärtner, 2004). Amartya Sen's (1981) work on entitlements led to the realisation that food supply was not enough to ensure the food security of the poor if they did not have physical and economic access to the food (CFS, 2012; Maletta, 2014). In response, in 1983, the Food and Agricultural Organization (FAO) re-defined food security as "ensuring that all people at all times have both physical and economic access to the basic food that they need" (FAO, 2006:1). The analysis of food security shifted focus from the national level to individual household level (Maletta, 2014).

The 1986 World Bank publication on "Poverty and Hunger" introduced a time element to food security and categorised food insecurity as being either chronic (a permanent feature) or transitory (a temporary shortage) (CFS, 2012). The definition of food security was further refined to include concerns such as the nutritional balance needed for a healthy and active life, preferences and socially acceptable food types (Napoli, 2011). A further component in the definition of food security concerned the actual quality and type of food supplied and a requirement that it should not merely satisfy protein-energy needs but also provide the nutritional balance necessary for a healthy and active life. In addition to this was the recognition of preferences, traditional habits and socially acceptable food types when considering the definition of food security. The 1996 World Food Summit (WFS) in came up with a definition that is now widely accepted. In this definition, "Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (FAO, 1996). The 1996 definition identified four pillars of food security, namely, accessibility, availability, utilization, and stability. This thesis will draw on the 1996 WFS definition because it is holistic and the four pillars of food security are measurable at a household level.

2.2 The nature of urban food insecurity

Rapid urbanisation in developing countries has been accompanied by an "invisible crisis" of urban food insecurity (Crush and Frayne, 2010:7). The invisible crisis of urban food insecurity is described as the silencing and marginalisation of the urban poor. Maxwell (1999) identifies three major reasons attributed to the political invisibility of urban food insecurity despite it being a real urban problem, particularly in African cities. Firstly, urban planners and managers focus on more urgent and visible urban problems such as unemployment, pollution, overcrowding and the growth of the informal sector even though these apparently evident problems are linked to food insecurity. Secondly, urban food insecurity is manifested at a household level unless there are major food supply problems or price hikes which can affect people at a community level. The third reason (see Crush and Frayne, 2010) is the focus of development practitioners and theories on food insecurity as a rural problem.

The manifestation and nature of urban food insecurity is different from rural food insecurity. Urban food insecurity has been promoted by the growth of an urban poor population mainly comprised of migrants from rural areas who flock to the cities in search of greener pastures. However, these migrants are often unskilled and uneducated which reduces their chances of employment in the formal sector which means that rapid urbanisation has been accompanied by the growth of informality as a survival strategy. Crush and Frayne (2011a) argue that urbanisation is significantly contributing to urban sprawl which, in turn, leads to increased costs of living and competition for energy, water and food. Battersby and Hayson (2016) postulate that the urban food crisis is manifested in diverse forms which include hunger and malnutrition, a lack of dietary diversity, child wasting and stunting, and increased vulnerability to diet-related diseases such as obesity and diabetes.

Food insecurity in urban areas hinges on issues pertaining to accessibility, affordability and availability since urban households have to spend nearly half of their income on food purchases (Frayne et al, 2009; Crush et al, 2011a; Oxfam, 2014). Food security in urban areas is, therefore, dependent on the ability to earn wages and food prices as opposed to rural food security concerns which are traditionally dominated by climatic factors (Maxwell, 1999). The accessibility of food is also determined by the proximity of food outlets. Crush and Frayne (2011b) argue that urban

dwellers can have economic accessibility to food but at the same time, the food can be spatially inaccessible when the food outlets are far or difficult to get to. On the other hand, supermarket shelves can be full of food yet it can be unaffordable to the poor, hence contributing to urban food insecurity. The vulnerability of urban populations is aggravated by the fact that they do not only have to buy food but they also need to pay for housing, transportation, healthcare and education due to the cash-based nature of urban communities (Cohen and Garret, 2010). The urban poor often have unreliable sources of income and they often cannot afford nutritious food. Mougeot (cited in Crush and Frayne (2011b: 782)) argues that:

> The capacity of the urban poor and middle class to purchase the good-quality food they need is undermined by a number of factors: currency devaluations; reduced purchasing power; salary reductions; formal-job retrenchment and the formalisation of employment; elimination of subsidies for needs such as food, housing, transportation, and health care; and the very uneven access of different income groups to retail food within cities.

The lack of stable and sustainable sources of income is, therefore, a key stumbling block to the realisation of urban food security.

Urban food insecurity is also characterised by nutritional transitions which are a result of rapid urbanization and economic development. The FAO (2017) describes nutritional transitions as a series of changes in diet, physical activity, health and nutrition. Drewnowski and Popkin (1997) posit that shifts in diet structure are associated with epidemiological transitions. The epidemiological transitions are accompanied by a shift away from infectious diseases and nutrient deficiency towards higher rates of coronary heart diseases and some types of cancer. Nutritional transitions in urban areas also mean that poor people have good access to bad food but bad access to good food in the form of diets high in complex carbohydrates, fats and saturated fats (Crush and Frayne 2011a; Oxfam, 2014; Mulugeta et al, 2017). Nutrition transitions in urban areas are attributed to the increase in employment outside the home, especially for women. Cohen and Garret (2010) argue that employment outside the home increases the opportunity costs of time which result in urban dwellers shifting from eating sorghum and root crops to easy to prepare grains like rice and wheat which are unfortunately susceptible to global food price fluctuations. Nutrition transitions, therefore, are interrelated to urban food security and nutrition.

2.3 The nexus between urban agriculture and food security

Urban agriculture presents valuable opportunities which can promote urban food security. Urban food production has been proven to be a response by poor households to insufficient, unpredictable and inconsistency of food access and the lack of purchasing power (FAO, 2008). The practice of urban agriculture can promote food availability and accessibility. Jongwe (2014) conducted a study in Gweru, Zimbabwe which reveals that there is a positive relationship between participation in urban agriculture and household food security significant at 5%. His study further reveals that food insecurity, or the perceived risk of it, compelled an overwhelming 96.2% of the respondents into urban food production in order to increase household food accessibility and availability. Furthermore, the food shortages prevalent in Zimbabwe in 2008 motivated 74% of Jongwe's study respondents to engage in or increase their participation in urban agriculture to solve their food challenges. Sebata et al (2014) similarly found that household participation in urban agriculture in Bulawayo contributed to increasing the number of meals consumed by households per day after harvesting. Urban agriculture promotes the availability and accessibility of staple food for up to four months in Harare and between one to eight months in Accra (Amar-Klemesu, 2000). In Malawi, urban households could support themselves entirely on the food they grew on their plots as they produced an average of 228 kg/capita of cereal which exceeds the 181 kg/capita recommended by the Government of Malawi for food budgets (Mkwambisi et al, 2011). Urban agriculture is, therefore, instrumental in catering for the two pillars of food security which are availability and accessibility. This is promoted by the ability of urban agriculture to foster an increase in a household's food base.

Urban agriculture can promote access to nutritionally rich foods for participating households. Urban food production in diversified food commodities like fresh fruits, vegetables, eggs and meat promotes healthier diets (FAO, 2008; Zezza and Tasciotti, 2010). Urban agriculture can promote nutrition and dietary diversity without compromising the culture or food preferences of participating households as they determine the types of crops they cultivate. The caloric and energy calculations of households in Gweru, Zimbabwe revealed that 52.9 % of urban farmers were food secure (Jongwe, 2014). A study in Nairobi compared farming and non-farming urban households and found that farming households were able to meet their energy and protein requirements (Mwangi cited in Amer-Klemesu (2000)). These farming households were also less

dependent on food transfers and gifts from relatives. In addition, the nutritional status of children from urban farmers in Nairobi was significantly better as compared to non-farming households who had moderately malnourished children. Urban agriculture presents opportunities for preventing nutrition deficiency diseases such as kwashiorkor and rickets amongst children. Zezza and Tasciotti (2010), in their study of urban agriculture in 15 developing countries, found greater dietary diversity in 10 out of 15 countries as a result of practicing urban agriculture. Greater dietary and nutrition diversity is instrumental in promoting healthy urban populations which boosts human capital.

The supply of food in the cities can be promoted through the practice of urban agricultural activities. Urban agriculture presents an advantage of producing food locally which is not affected by global market speculation and price volatility (FAO, 2008). Urban populations are largely dependent on urban markets where they purchase more than 90% of their food (IFPRI, 2003). The rapid population growth experienced in the world's cities means that there will be an increased demand for fresh foodstuffs which can partly be provided by urban agriculture at affordable prices. Pedzisai et al (2014) reiterate that urban food production improves price stability and helps to lower the cost of similar agricultural produce imports. Urban food supply initiated by urban agriculture is accompanied by food self-reliance and self-sufficiency in the cities. Amar-Klemesu (2000) argues that the concept of self-sufficiency in cities should not mean that urban agriculture will satisfy the demand for staple crops like cereals which can be transported from rural areas. Instead, urban agriculture promotes self-sufficiency through the provision of the more easily perishable vegetables and poultry products. Moustier and Daso (cited in Arku et al, 2012) argue that food supply and prices in the cities can be stabilised through the complementary role that urban agriculture can play to rural production. Urban agriculture, therefore, presents opportunities for promoting the stability of market prices.

Urban agriculture is an alternative source of livelihood which increases household incomes. Zezza and Tasciotti (2010) estimated that 40% of urban dwellers in Africa are involved in agricultural and related sectors. Pedzisai et al (2014) suggest that urban agriculture improves the family budgets of farmers. Urban agriculture reduces the reliance of households on wage income for the procurement of food by making it available on their own plots. Household participation in urban agriculture is also pivotal in reducing household food expenditures. Households are able to save the amount of money that they could have used for purchasing food for other economic

activities or buying more nutritious food (Amar-Klemesu, 2000; Kutiwa et al, 2010; Pedzisai et al, 2014). Income is achieved through the sale of surplus or the commercialization of urban food production (FAO, 2008). Findings from a study in Orange Farm, located on the outskirts of Johannesburg, South Africa confirm that households practicing urban agriculture spent an average of R350 on food whilst non-practicing households spent R640 (Mthethwa, 2012). The populations in Pedzisai et al (2014) and Jongwe (2014) studies also consumed the food they produced, and the food was relatively cheaper as compared to non-farming households. The increase of incomes places urban households at better positions of achieving food security as they grossly rely on income for the procurement of food. This present study, therefore, sought to investigate if there really is a nexus between participation in urban agriculture, particularly home-based agriculture production, and household food security.

The potential of urban agriculture to solve urban food problems has been critiqued by a number of authors. For example, Zezza and Tascotti (2010: 266) argue that some of the literature on urban agriculture is driven by advocacy purposes and is, therefore, sometimes guilty of 'promoting' the sector based on scant data. The most widely cited estimates of the UNDP (1996) claim that 800 million people are actively engaged in urban agriculture of which 200 million produce goods for sale with a full-time job equivalent estimate in production and processing of 150 million jobs. However, these statistics are actually based on estimates by the Urban Agriculture Network (Zezza and Tascotti, 2010). The caution by the Urban Agriculture Network that their intent is to simply present a thumbnail sketch is often overlooked by the many authors who cite the statistics (Webb, 2011). Focusing on urban agriculture studies in South Africa, Webb (2011) concurs with Zezza and Tasciotti (2010) that there are methodological flaws and a lack of evidence to support claims (few attempts to quantify yields, lack of clear links with nutrition, taking the views and perceptions of cultivators at face value without deep analysis) in urban agriculture literature. He further argues that the successful studies have been repeated over and over again in literature but few attempts have been made to quantify yields. While it is true that earlier studies on urban agriculture might be characterised by methodological flaws or of overstating the benefits of urban agriculture, this study sought to contribute to the urban agriculture literature by engaging in empirical research utilising a mixed methods approach.

The contribution of urban agriculture to livelihoods and poverty alleviation has also been under scrutiny. Urban agriculture is not largely practiced by the poorest that lack access to land, and

necessary resources (Tevera (1999) in Crush et al, 2011; Zezza and Tasciotti, 2010). Zezza and Tasciotti further concluded that the total income derived from urban agriculture is much lower than participation rates. They argue that the potential for urban agriculture to contribute to urban food and nutrition security, livelihoods and poverty alleviation is limited. Studies elsewhere similarly show that the benefits of urban agriculture are economically insignificant and it generates the smallest share to household incomes (Sombalo cited in Mthethwa, 2012). Critics argue that the proponents of urban agriculture claim "…too much by equating all food production in towns with improved food security for poor people and offers too little by failing to consider the role of rural-urban interactions in explaining the survival capabilities of the urban poor" (Ellis and Sumberg, 1998: 221; Webb, 2011; Crush et al, 2011). While some of the critique of urban agriculture may be true, it is important to look at case by case issues as urban agriculture practices vary across cities. Households can engage in urban agriculture for other reasons besides contributing to livelihoods and food security. This study sought to unravel the determinants and motivations of household participation in home-based agricultural production so that its link with household food security can be easily identified. The ability of urban agriculture to contribute to food security also differs depending on context and the case in Bulawayo is different from other cities.

2.4 Sustainable Urban Development through Urban Agriculture

2.4.1 Economic sustainability

Urbanisation in many countries is accompanied by problems such as unemployment and urban agriculture can potentially provide employment to people. Moreover, households can not only reduce their expenditures on food by engaging in urban agriculture but they can also sell surplus produce. In cities such as Dar es Salaam, urban agriculture is the second largest employer (20% of those employed) and it forms at least 60% of the informal sector (Jacobi, 2000; Cofie, 2013; RUAF Foundation, 2017). In Malawi, 17 percent of the respondents reported that they had worked in some sort of urban agriculture enterprise during the 2004/2005 agriculture year, making urban agriculture the second most important source of income of all households surveyed for employment (Mkwambisi et al, 2011). A study in South-eastern Nigeria reported that tree crops and livestock produced in home gardens accounted for more than 60% of household income (Gelhena et al, 2011).

Urban agriculture does not only present job opportunities in developing countries but also in developed countries. Kobayashi et al (2010:14) reveal that in the USA a community urban agriculture project funded by the USDA provided an estimated 2,300 jobs and incubated over 3,600 micro-businesses over a period of 5 years. Conner et al (cited in Golden, 2013) projected that locally produced vegetables and fruits in the state of Michigan generated nearly 1,800 jobs and US$211, 5 million in income. Similar projections in a planning scenario for a region in British Columbia, Canada estimated that with strong management and government support, urban farmers had the potential of creating 26 full-time jobs and $2, 39 million dollars in revenue (Golden, 2013:12). Urban agriculture presents opportunities of employment from production, marketing and processing (e.g. jams, dried fruits and pickles) which can be instrumental in reducing the unemployment burden in some of the world's urban areas.

2.4.2 Social Sustainability

Urban agriculture can act as an important strategy for poverty alleviation and social integration (RUAF Foundation, 2017). Allotment and community gardens established by municipalities and NGOs are instrumental in involving disadvantaged sectors such as orphans, the disabled, women, recent immigrants without jobs, or elderly people, with the aim to integrate them more strongly into the urban network and to provide them with a decent livelihood (Zeeuw et al, 2011; RUAF Foundation, 2017). Personal transformation and resistance to social and economic marginalisation can be catalysed by interacting with plants (Pudup, 2008). Stereotypical gender roles may be challenged in the space of a garden, for example, when women recruit men for labour-intensive tasks without relinquishing power over their gardens to them (Taylor and Lovell, 2011). In Bulawayo, a study revealed that 75% of female respondents had their level of decision-making in their households improved as a result of engaging in urban agriculture (Sebeta et al, 2014). Success in garden activities helps women gardeners to generate a sense of agency and self-efficacy which can prompt them to seek new opportunities and responsibilities which extend beyond their gardens (Parry et al cited in Taylor and Lovell, 2012). Urban agriculture hence presents opportunities for empowering disadvantaged members of society through poverty alleviation and social integration.

2.4.3 Environmental sustainability

Urban agriculture presents opportunities for conserving the environment; it can contribute to greening cities and utilising open land by making use of land that is not fit for construction (e.g. under power lines) (Kaufman and Bailkey, 2000). Unutilised and degraded open and vacant spaces are a source of potential crime and health problems when communities turn them into informal dumping sites (RUAF Foundation, 2017). Turning such places into productive spaces improves the health and well-being of communities. The greening of non-greenspace areas such as balconies or roofs promotes disaster reduction and adaptation. The effects of flash flooding can be mitigated by replacing impervious surfaces with soil for growing crops (Lake et al, 2011). These open green spaces can also help to improve water table levels in cities through promoting infiltration (Dubbeling et al. 2009). Furthermore, the green spaces created through urban agriculture provide an ideal environment and refuge for wildlife species such as birds, small mammals, reptiles, and insects (Gelhena et al, 2011). Urban agriculture presents opportunities for creating urban green areas which are not only important for the environment but also for health and well-being.

Growing cities produce more and more wastewater and organic wastes which can pose serious developmental problems. Urban agriculture can solve the problems of increasing waste in cities through turning it to compost. The use of compost by urban farmers helps to reduce the use of chemical fertilisers, thus preventing problems related to the contamination of groundwater (RUAF Foundation, 2017). Wastewater can also be recycled for irrigation leading to a reduction in the demand for fresh water supplies and discharge of wastewater into water sources leading to the decrease of water pollution (Buechler et al, 2006; Zeeuw et al, 2011). The productive reuse of urban organic wastes and wastewater can be instrumental in reducing methane emissions from landfills and energy use required for the production of chemical fertilizers (RUAF Foundation, 2017). However, the use of untreated waste water by some urban gardeners poses health risks. Livestock and poultry manure can replenish urban soils and contribute to nutrient recycling in the ecosystem through adding nitrogen, potassium, and phosphorus into the soil (Gaynor, 2006; Gelhena et al, 2011).

The production of food near the city is important in reducing energy use and green gas emissions. Long distance transporting of food related costs and carbon emissions are reduced if food producers and consumers are in the same locality (Church, 2005; Arku et al, 2012). The UN Comprehensive Framework for Action of the High-Level Task Force on the Global Food Crisis

states that: “A paradigm shift in design and urban planning is needed that aims at … [r]educing the distance for transporting food by encouraging local food production, where feasible, within city boundaries and especially in immediate surroundings’’(Zeeuw et al, 2011: 156). The current system of transporting food from farms to the cities in industrialised nations requires four times more energy and many cities in developing countries are treading towards the same direction (Heinberg and Bomford, 2009). The reduction of the ecological footprint in food production is fundamental in promoting sustainable urban development and ameliorating the effects of climate change in cities. As this discussion suggests, urban agriculture can generate multi-dimensional benefits which extend beyond addressing food insecurity, increasing incomes, and diversifying livelihoods.

2.5 Characteristics of urban farmers

The urban agriculture literature attributes different characteristics to urban farmers. Urban agriculture is characterised by actors who are diverse in terms of their socio-economic circumstances and livelihood strategies (De Bon et al, 2010: 23). People who engage in urban agriculture are not homogenous as there are different motivations behind its practice. Urban farmers are mainly comprised of low-income earners, especially in developing countries (Smit et al, 1996; Mougeot et al, 1998). A study conducted by May and Rogerson (1995) in South Africa, revealed that the largest group of urban cultivators were from remittance-dependent or welfare dependent households. Conversely, other studies suggest that urban agriculture is not practiced by the poorest as they have limited access to land; they also tend to shift residences too often for them to engage in urban agriculture (Tevera (1999) cited in Crush et al, 2011; Reuther and Dewar, 2005). In Tanzania, Dar es Salaam 18.5% of the targeted population in an urban agriculture study was small business people or trade owners and 15.8% were professionals (Sawio cited in RUAF Foundation, 2017). Mkwambisi et al’s (2011) study in Malawi also reveals that there are elite urban farmers, who engage in urban agriculture mainly for sale rather than for household consumption. Urban agriculture is thus not confined to solely poor farmers as there are different reasons behind the practice of urban agriculture other than poverty alleviation.

Urban agriculture is usually regarded as women’s economic activity yet men are also key actors in urban farming. Maxwell (1995) suggests that urban agriculture might be regarded as a source of empowerment as financial resources formerly used for food purchases can be channeled to

other productive activities. Maxwell found that urban farming in Kampala, Uganda was a strategy by women to protect and enhance their income. Fouken (2006) posits that women tend to concentrate their agricultural activities near their urban homes so that they can also engage in other household chores. Winklerpins and Souza (2005) argue that home gardens are a feminised part of agriculture as they are predominantly maintained by women due to their close proximity to the home. In the Global South, home gardens are often under the domain of women, who are responsible for maintaining and transmitting knowledge on gardening practices (Taylor and Lovell 2011). In a survey conducted in Santarem, Brazil by Winklerpins and Souza (2005), 72% of home gardens were managed by women, 16% by men, and the remainder by both men and women together. However, a sample of home gardeners in a study in Mutare, Zimbabwe was dominated by males (66.3%) while females made up only 33.8% of the sample (Mrema and Chitiyo, 2011). Women and men engage in urban agriculture but the reasons behind their practice of the activity may differ from one context to another.

There is an assertion in urban agriculture literature that most urban farmers are former rural dwellers. This is based on the premise that new migrants transfer rural subsistence agriculture to urban areas (Obasu-Mensah cited in Mthethwa, 2012). Winklerpins and Souza (2005), for example, found that the corpus of home garden knowledge came from antecedent rural experiences where most of their participants came from. However, other studies reveal that urban farmers are not recent migrants. Urban cultivators are individuals who have dwelt in the city long enough to have acquired access to some land and other resources (Maxwell, 1995; Nugent, 2000). For example, a study in Addis Ababa demonstrated that urban agriculture was an occupation taken by those who had established links through time and had accessed resources which might not be possible for recent migrants (Egziabher, 1994). Foeken, et al (2000) similarly found that about 85% of the sampled urban farmers had been residing in the city for more than 14 years. Studies in urban agriculture have also distinguished urban farmer characteristics such as home ownership, the number of people in a household, the level of education, and sources of income (Maxwell, 1995; Taylor and Lovell, 2012; Mthethwa, 2012). This study investigated the characteristics of urban home gardeners in the Bulawayo context.

2.6 Typologies of urban gardens

2.6.1 Community Gardens

A community garden is a piece of land farmed by a group of people on shared or individual plots primarily for self-consumption (Sithole, 2008). Community gardens are also defined as places where people from more than one household cultivate on land they do not own (Vitiello et al, 2009). Urban community gardens are grassroot initiatives which combine individual and collective gardening on sites which grant partial or complete access to the public (Bendt, 2010:16). There is a general consensus that community gardening is practiced on land that a group of people does not own, be it public or private. Community gardens may produce fruits and vegetables but some are for recreation or biodiversity (Crossan et al, 2015). Smith and Krutz cited in Bendt (2016:5) argue that in the 1970s in countries such as the USA "citizens in socially deprived areas began gardens on derelict and vacant lots in order to beautify their neighborhood". Community gardens are now a feature of many cities in the world due to the benefits they hold for the well-being of urbanites.

2.6.2 Allotment Gardens

Allotment gardens are another common feature of gardens found in cities all over the world. These are described as separate parcels of land allocated to individuals or households for their personal use (Sithole, 2008). Allotment gardens have small land parcels of about 200 to 400 square meters concentrated into one place (Macnair, 2002). The small parcels of land are cultivated by individuals or families, usually organized in an association, unlike community gardens whereby one entire area is collectively cultivated by a group of people (Holmer, et al 2003; Optiz et al, 2016). The land for allotment gardens is made legally available by city authorities. Drescher et al (2006) posit that allotment gardeners may lease land from an owner who may be a private or public entity for the sole purposes of agricultural production. In some countries, allotment gardeners might be required to pay a small membership fee to their association and they have to abide by the corresponding constitution and by-laws (Holmer and Drescher, 2005; Holmer et al, 2003). In developed countries like Germany, allotment gardens are not used only for the purposes of agricultural production; they are also areas of recreation and meeting with friends (Cabral, 2014).

The origins of allotment gardens can be traced back to Germany in the 1860s. Holmer et al (2003), argue that the idea of allotment gardening reached its first peak in 1864 when the first allotment Gardeners' Association was established in Germany. Allotment gardens were

developed during the industrialisation period of Europe to cope with the increasing number of poor people who were migrating from rural areas to cities (Kasch cited in Holmer et al, 2003). The allotment gardens were founded in order to deal with the situation of the poor migrants and they were initially referred to as "gardens for the poor". The plots of land for allotment gardens were provided by factories and monasteries where the poor were allowed to produce vegetables, fruits and small domestic animals for their household consumption (Kasch cited in Holmer et al 2003). The main function of allotment gardens in their early development stages was to enhance household food security but presently they also serve as recreational areas and locations for social gatherings (Holmer et al, 2003; Drescher et al, 2006).

2.6.3 Home gardens

The central focus of this study is on home-based gardening. In the literature, home gardens are also described as mixed, kitchen, backyard, farmyard, compound or homestead gardens (Galhena, 2013). For the purposes of this thesis, the term home-based agricultural production and home gardening will be interchangeably used. Home gardens are defined as pieces of land cultivated by individuals or households who have access to land in their home or near their home (Drescher et al, 2006). Households or individuals can have access to land for home gardening either through customary or legal law. Kortright and Wakefield (2011) define a home food garden as a fruit and/or vegetable garden on leased, owned, or borrowed land directly adjacent to the gardener's residence; it may include planting in containers or on rooftops. Galhena et al (2013) posit that in most cases, home gardening refers to the cultivation of a small portion of land which may be around a household or within walking distance from the family home. There is a consensus that a home garden is located within a household or near a household's or individual's home. Home gardens can be in backyards, front yards, balconies, roof tops, parkways, rights-of-way and other interstitial spaces (Taylor and Lovell, 2012). Home gardens are located in close proximity to the home to increase security, convenience and accessibility.

Home gardening is an ancient and widely practiced activity. Ninez in Galhena et al (2013: 2) argues that "food production on small plots adjacent to human settlements is the oldest and most enduring form of cultivation". Galhena et al (2013) further reiterate that home gardens have been an important component for family and local food systems in the world for centuries. Home food gardens are instrumental in supplementing a household's income and contributing to household

food and livelihood security. Taylor and Lovell (2012) posit that home food gardens can be set apart for the cultivation of entirely annual vegetables and herbs or they may also include perennial ornamental, medicinal, or fruit trees, beehives and chicken coops. The motivations and determinants for home garden production differ from household to household. The motivations can include ensuring household food security, cultural reasons, hobby, environmental conversation or a combination of purposes (Drescher et al, 2006; Kortright and Wakefield, 2011; Galhena et al, 2013).

2.7 Motivations behind the practice of Urban Agriculture

2.7.1 Northern Paradigm

Urban dwellers have various motivations which influence their practice of urban agriculture (UA) in different garden typologies. In a study of Urban Allotment Gardens in Portugal, da Silva et al (2016) identified two types of motivations for engaging in UA which are initial and secondary or unexpected motivations. They describe initial motivations as the reasons that lead people to engage in UA for the first time whilst secondary motivations arise from the experience of gardening itself. There is agreement amongst a number of scholars that food production is one of the key motivations for household participation in urban agriculture (Mrema and Chitiyo, 2011; Ruggeri et al, 2015; Poulsen et al, 2015; Da Silva et al, 2016). However, in more developed countries particularly, motivations for engaging in UA have expanded far beyond food security concerns to include ensuring food safety, environmental and health concerns, recreation, education, and social cohesion (Golden cited in da Silva et al, 2016). In some economically underdeveloped regions of countries such as Romania and Bulgaria, poor people engage in urban agriculture as a food security coping strategy whilst for richer regions motivations of the desire for healthier food and personal wellness are at the forefront (Ruggeri et al, 2016).

Scheromm (2015) conducted a study in Montpellier, France which confirms that the key motivations for gardeners in developed countries exceed food concerns. He conducted in-depth interviews with 40 farmers cultivating in community and allotment gardens and found that the key motivations for engaging in urban agriculture were for pleasure, social interaction and passing on skills to younger generations. Kortright and Wakefield (2011) similarly came up with a typology of home gardens in Toronto, Canada which is also a clear indicator of the motivations

of practicing urban agriculture in the North. They identified food gardens which are more focused on ensuring household food security, teaching gardens for those who wanted to transfer gardening skills to their children, environmental gardens which are as a result of the desire to conserve the natural environment, hobby gardens and aesthetic gardens. Battersby and Marshak (2013) equally articulate that the Northern Paradigm of urban agriculture is not centered only on augmenting household nutrition and food security but rather it includes creating safe havens for women and providing children with a safe place to play, enhancing feelings of self -worth as well as improving the physiological well-being of the participants.

2.7.2 Southern Paradigm

Urban agriculture in countries of the Global South is largely a livelihood strategy. For example, in Zimbabwe, where there are high incidences of poverty and unemployment, urban agriculture is practiced to cope with food scarcity and hunger. Halweil and Nierenberg (2013) argue that the cultivation of food in urban areas of developing countries for most people is not a hobby but a necessity. UA is not often a matter of choice but a means of employment and food provision (Smit and Nasr 1992; Hamilton et al. 2014). In the same vein, Battersby and Marshark (2013) argue that in the Southern Paradigm urban agriculture is viewed as a developmental tool which is promoted due to its ability to enhance food security and increasing household incomes through the sale of produce, thus contributing to urban poverty alleviation. Crush et al (2011) propound that there are three categories of urban cultivators which help in discerning the motivations behind the practice of urban agriculture in developing countries. The first group is made up of low-income earners which engage in urban agriculture due to absolute need and they cite an example of Zimbabwe urban household practices to cope with the effects of Economic Structural Adjustment programme in the early 1990s. The second group is comprised of households who choose to grow food in order to reduce their vulnerability to inflation and the breakdown of formal food channels whilst the last group is comprised of entrepreneurs who practice urban agriculture for the purposes of sale rather than household consumption.

Poulsen et al (2015) reviewed literature on the motivations of engaging in urban agriculture in developing countries which concur with Crush et al (2011). The literature review highlights that the leading motivation for engaging in all forms of urban agriculture was to produce food for household consumption which was a repeated finding in nine of the studies reviewed. Poulsen et

al (2015) report that the need for improving household income was reported to be the second most important driver of participation in urban agriculture. A multi-country review study conducted by Zezza and Tasciotti (2010) further supports that the predominant motivation behind the practice of UA in the South is production for household consumption. These reviews contradict Crush et al's (2011:296) findings that urban agriculture does not significantly contribute to household food security particularly in Southern Africa. It is clear that the contribution of urban agriculture to household food security is context specific and it cannot be generalized. This study, therefore, sought to unravel the motivations behind the practice of home based agricultural production in the city of Bulawayo, Zimbabwe.

2.8 Policy and Legal Framework of Urban Agriculture in Zimbabwe

There is no clear national policy regulating urban agriculture in Zimbabwe. Agriculture has always been regarded as a rural economic activity leading to the failure of city planning to cater for urban agriculture (Kutiwa et al, 2014). The governance structure of the country accords the local government authority the power to regulate all activities within its jurisdiction which include agricultural production, marketing and processing (Toriro cited in Moyo, 2014). The local governments are guided by a number of statutory instruments such as the Regional Town and Country Planning Act (1976) and the Urban Councils Act (1995) (Moyo, 2014:130).

The Urban Councils Association of Zimbabwe, which represents all urban local authorities resolved to support urban agriculture in a communique termed as Nyanga Declaration on Urban Agriculture in 2002 (Moyo, 2014). In 2003, following the Nyanga Declaration, a similar concerted regional effort to support urban agriculture was made in Harare. Ministers of Local Government from Kenya, Malawi, Swaziland, Tanzania and Zimbabwe convened in Harare on 28 and 29 August 2003 to discuss the theme of urban and peri-urban agriculture and agreed that urban agriculture is an important livelihood strategy which should be promoted by creating an enabling environment in Africa's cities (Chaminuka and Makaye, 2015). The Harare Declaration urged local governments to develop appropriate incentives to encourage the growth of urban agriculture whilst NGOs were urged to support urban agriculture in order to promote urban poverty alleviation. Mushayavanhu in Kutiwa et al (2014) argues that the Harare Declaration was instrumental in the creation of policy and legal frameworks for urban agriculture such as the National Environmental Draft Policy, which provides strategic directions which include

"…developing and publishing guidelines on urban agriculture, assisting local authorities to plan ways to integrate and co-ordinate support for urban agriculture, and establishing extension programs to promote sustainable urban agriculture" (Kutiwa et al, 2011: 86).

The Bulawayo City Council (BCC) operationalized the Nyanga and Harare declarations by producing the Bulawayo Urban Agriculture Policy, which lays a policy and institutional foundation for how agriculture must be integrated into urban development and to promote food security, income generation and employment (Bulawayo City Council, 2008). The policy was prepared by a Steering Committee of the Bulawayo Urban Agriculture Multi-Stakeholder Forum which comprised of academicians, Agriculture and Extension Services personnel, NGOs and technical officers from the Bulawayo City Council. The Bulawayo Urban Agriculture Forum was established in October 2005 under the support of the Cities Farming for the Future (CFF) Programme (BCC, 2008).

The Bulawayo Agricultural policy seeks to mobilise Bulawayo residents to fully participate in urban agriculture to encourage self-reliance, poverty alleviation, food security and income generation. The city's Agricultural Policy tackles the challenges of urban agriculture in the country which include water, land, finance, legal issues and the lack of an institutional framework. The City Council commits itself to provide land for urban agriculture through reserving the land it owns for the economic activity, negotiating with private landowners and allowing people to farm along streams banks if they cultivate their crops at least 30 meters away from the stream. Residents are allowed to cultivate creeping crops such as groundnuts and beans along roads. The city council, working together with its partners such as the Agricultural Extension and Services Department and NGOs are to provide training to urban farmers to promote sustainable farming practices (Bulawayo City Council, 2008).

2.9 Challenges of Urban Agriculture

The practice of urban agriculture is associated with problems which have made it to be subject of criticism. A universal challenge to urban agriculture is the availability and access to land. Badami and Ramankuty (2015) present a critique of urban agriculture based on the physical capacity of urban agriculture and the availability of land for food production. While they do not deny the benefits of UA, they investigate the extent to which it is capable of producing sufficient food to address the food security challenges of urban dwellers. They conclude that UA in the

long run has low potential or would be infeasible in terms of land availability to achieve even the low threshold of growing the daily vegetable intake. This is particularly true in low-income countries which are characterized by high population growth and exceptional poverty and malnutrition. However, their study focuses on built up areas; they do not consider rooftop gardens, the reality of the use of balconies, old dishes, sacks, pots and Government policies which are making land more accessible to urban farmers.

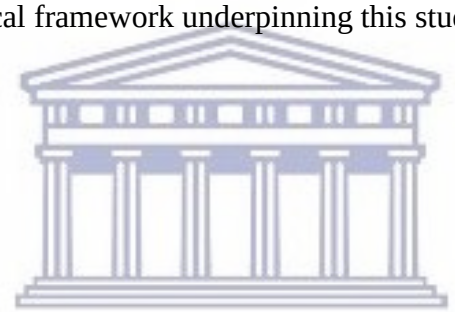
Water scarcity in urban areas is a major challenge experienced by urban farmers. In a study conducted in Zimbabwe by Kutiwa et al (2011), most respondents indicated that water **(**36%) and a shortage of inputs (20%) are major challenges they encountered. This is particularly true for home-based gardeners who rely on the Municipal water supply which can be cut for more than two weeks if there is a drought. The use of recycled water is feared to contaminate food and intensive irrigation might lead to the spread of malaria and waterborne diseases (Stewart et al, 2013). However, in cities like Lima, Peru, the use of recycled water cannot be associated with health hazards as urban farmers use treated recycled water for irrigation purposes (Buechler et al, 2006). Health risks related to urban pollution are a barrier to some urban farmers. In Toronto, Canada some gardeners feared potential air pollution caused by diesel trains running through Weston-Mt. Dennis or the contamination of soil by previous owners and dust deposited on their plants (Kortright and Wakefield, 2011). Nevertheless, some gardeners interviewed did not feel that such health-related risks were significant enough to outweigh the benefits they derived from the practice of urban agriculture.

Urban cultivators also face challenges of marketing their products in the cities. In Kutiwa et al's (2011) study, all of the respondents reported that they did not have access to formal markets to sell their produce. Their situation was worsened by the tight competition they face with produce from rural areas and commercial farms. Urban farmers who do get access to markets are often short changed by middlemen (Mkwambisi et al, 2011). Urban farmers also encounter conflicts with neighbors who might view home gardens to be a source of pests (Bhatti and Church, 2001). In the USA, a Chinese-origin gardener reported that her non-Chinese-origin neighbor objected to her front yard garden, characterising it as messy (Taylor and Lovell, 2012). The other challenges encountered by urban farmers include access to capital or credit, access to seeds and planting materials, weak extension and advisory services, access to labor, and access to markets (Mkwambisi et al, 2011; Moyo, 2014; Kutiwa et al, 2014). This study also sought to investigate

on the challenges experienced by home gardeners in Bulawayo and the measures that are being taken to address the challenges.

2.10 Summary

This chapter has appraised literature on urban agriculture. The historical development of the concept of food security and the nature of urban food insecurity were examined. The chapter established the nexus between urban agriculture, food security and sustainable urban development. The characteristics of urban farmers, typologies of urban gardens, and the motivations behind the practice of urban agriculture were reviewed. The policy and legal framework regulating urban agriculture in Zimbabwe were appraised and the challenges associated with the practice of urban agriculture have also been highlighted. The following chapter focuses on the theoretical framework underpinning this study.



CHAPTER 3: THEORETICAL FRAMEWORK

3.0 Introduction

Urban agriculture can play an important role in promoting sustainable urban livelihoods. Indicators of sustainable livelihoods such as improved food security and well-being can be attained through participation in urban agriculture. This study employed the Sustainable Livelihoods Framework (SLF) as its theoretical framework. This chapter describes the components of the SLF and pinpoints its applicability to the present study. The first section analyses the emergence and evolution of the framework and its definition. This is followed by an analysis of the components of the framework which include the five capitals and the institutional framework in which livelihoods operate. The strengths and weaknesses of the framework are discussed before the chapter summary.

3.1 The emergence and evolution of the SLF

The term livelihood simply defined refers to the way people make a living whilst the concept of sustainability denotes the ability of the present generation to fully utilise its resources, particularly the environment, without compromising the needs of future generations (Sauvé et al, 2016). The term sustainable livelihood is highly contested and some definitions are incoherent, simplistic and are relatively narrow, resulting in conceptual entanglements (Carswell et al in Scoones, 1998). However, the most comprehensive and widely-used definition of a sustainable livelihood has been proffered by Chambers and Conway (1992: 6) who state that:

> A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. A livelihood is sustainable when it 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 contributing net benefits to other livelihoods at the local and global levels both in the short and long term.

By contrast, Scoones (1998:5), in a widely cited paper, defines sustainable livelihoods in a simpler and modified way:

> A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when

it can cope with and recover from stresses and shock, maintain or enhance its capabilities and assets, while not undermining the natural resource base.

The term capability in the sustainable livelihood definition was derived from Amartya Sen's Capability Approach and refers to the freedom to achieve valuable functionings (DFID, 2000). Sen (1992) describes a capability as a set of vectors of functionings, reflecting the person's freedom to lead one type of life or another while functionings refer to what a person is capable of doing and being. Examples of functionings include being adequately nourished, comfortably clothed, to lead a life without shame etc. (Chambers and Conway, 1992). The concept of capabilities, therefore, encompasses far more than the material concerns of food intake or income that can be accessed by poor people (Scoones, 1998:6).

Bennet (2010) argues that the term asset in the sustainable livelihoods framework was developed from the work of Swift (1989) on human vulnerability and famine. Swift came up with three classes of assets, namely, investments, stores and claims. Chambers and Conway (1992) adopted and broadened Swift's definition of assets by dividing them into tangible (stores and resources) and intangible assets (claims and access). Stores include food stocks, cash in banks, stores of value such as jewelry whilst resources include water, land, trees and farm equipment. Chambers and Conway (1992:8) further explain that claims are:

> [D]emands and appeals which can be made for material, moral or other practical support or access… Access is the opportunity in practice to use a resource, store or service to obtain information, material, technology, employment, food or income.

These assets are built up or invested when production surpasses consumption requirements with the ultimate goal of lessening the susceptibility of households and communities to shocks and stresses (Bennet, 2010). People construct a living out of the tangible and intangible assets that they possess.

The term sustainability was first put forth in the concept of sustainable development by the Brundtland Report in 1987, which defined sustainable development as the development which "…meets the needs of the present generation without compromising the ability of the future generations to meet their own needs" (United Nations General Assembly, 1987:43). The Sustainable Livelihoods Framework (SLF) can, therefore, be best defined as a people-centered framework, which seeks to enable its users to apprehend, evaluate and explicate the main factors

that affect the livelihoods of poor people (Carney, 2002). The SLF is a conceptual tool which is constructed to understand the livelihoods of poor people (Pain and Lautze, 2002). The SLF was, therefore, relevant for this study as it was instrumental in highlighting and contextualizing the possible factors promoting or militating against urban agriculture and household food security which is an outcome of a sustainable livelihood.

The sustainable livelihoods framework is part of the people-centered development discourse. Brocklesby and Fisher (2003) attribute the evolution of the SLF to changing understandings on the concepts of poverty, participatory methodologies and sustainable development. Pettersen and Pedersen (2010) argue that the term livelihood can be traced back to the 1940s when it was used mostly in economic terms. Morse and McNamara (2013) concur with Pettersen and Pedersen by acknowledging that the concept of sustainable livelihoods progressively developed from ideas which predate the 1992 Earth Summit. Krantz (2001), however, notes that the SLF evolved in a period of focus on the international development agenda being spearheaded by the need for maximising the effectiveness of interventions for the benefit of the poor.

The SLF has resonance with World Bank Integrated Rural Development (IRD) strategies. Integration in IRD of the 1960s encompassed focusing attention on a number of sectors and their being exhibited in big projects such as agricultural and infrastructural development (Morse and McNamara, 2013). These projects, however, tended to be top-down and failed to meet the priority needs of the poor. The SLF borrowed participatory methodologies from Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) which sought to include households in the knowledge generation process. RRA and PRA focus on working with households at a village scale whilst the SLF seeks to work with individuals from a household level (Korf and Oughton, 2006).

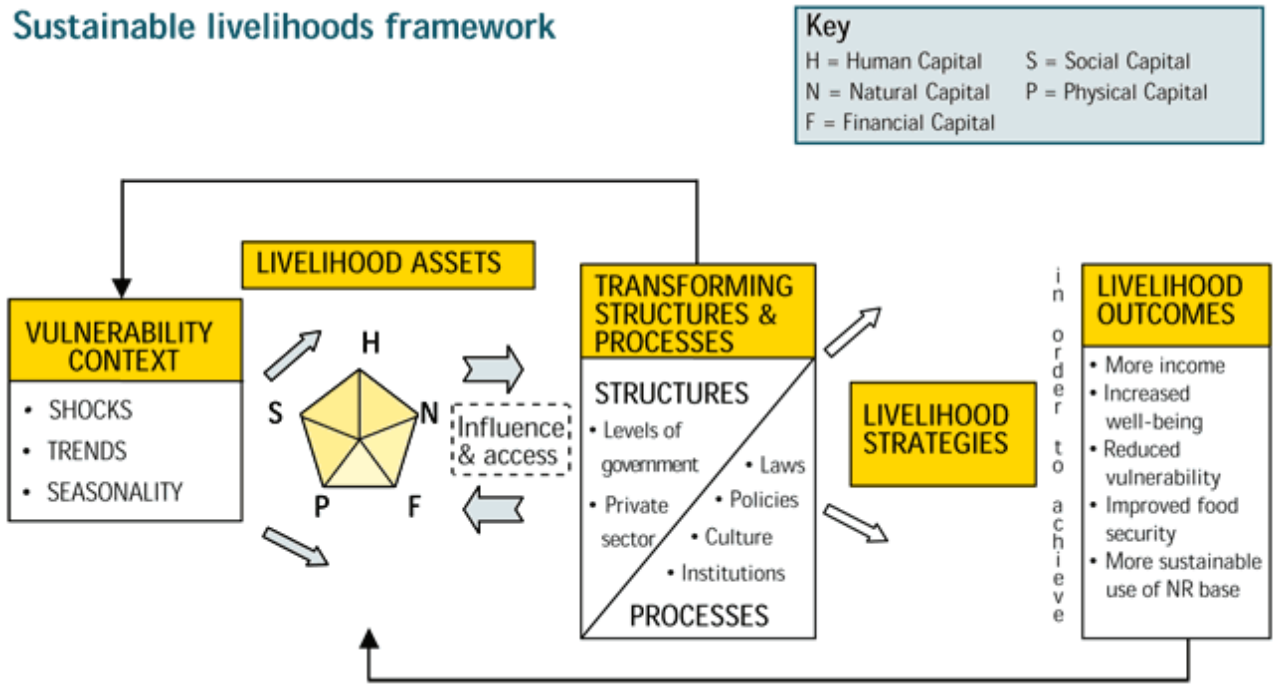
The work of Robert Chambers and M.S. Swaminathan, together with Amartya Sen's work on capabilities, played a pivotal role in shaping the Sustainable Livelihoods Framework (Devereux, 2001). Chambers and Conway in 1992 published a seminal article on sustainable livelihoods which has constituted the basis of the SLF as developed by the DFID (Patnaik and Prasad, 2014). The direct mention of the term sustainable development is evident in Agenda 21 of the Rio 1992 Earth Summit whereby it was deliberated that every human being should be accorded with the opportunity of attaining a sustainable livelihood (Haider, 2009). The SLF has, therefore, gained fame as a result of its promises of capturing the livelihood assets, vulnerability and transforming

structures of the poor through their local holistic understandings of poverty. Brocklesby and Fisher (2003) stipulate that the SLF provides a dynamic shift from needs-based, resource centered solutions to poverty alleviation by offering a people-centered focus which builds on their strengths hence offering sustainable livelihood outcomes.

3.2 Components of the Sustainable Livelihoods Framework

The Sustainable Livelihoods Framework shown in Figure 3.1 below assumes that people live within a vulnerability context made up of shocks, trends and seasonality. The vulnerability context is directly affected or determined by transforming structures and processes which include levels of government, laws, policies and culture that determine the livelihood strategies people pursue to meet their desired livelihood outcomes such as food security. People are assumed to have various assets, namely, financial, social, human, physical and natural capitals which are strengthened by the different livelihood outcomes that are a result of the livelihood strategies engaged in by people (DFID, 2000). The framework hence depicts conditions which determine people's access to assets and livelihood opportunities which can be converted into sustainable livelihood outcomes thus propelling people out of the deprivation trap of poverty.

Figure 3.1: The Sustainable Livelihoods Framework



Source: DFID (2000)

3.2.1 The Vulnerability Context

The vulnerability context describes the external environment people exist in which directly impacts on their asset bases. It comprises of trends, shocks and seasonality which are important as they impact directly on the lives of people. Its location on the furthest part of the framework is a clear indicator of how it is outside the control of the stakeholders (Devereux, 2001). The DFID (2000) defines shocks in the vulnerability context as sudden pressures which are applied on livelihoods such as, for example, a severe drought which could constrain human, physical and natural capitals. Stresses, however, refer to long-term pressures such as economic crises which may hamper livelihood opportunities such as employment in the near future, thus taking into consideration the future is crucial in assessing the livelihoods of the poor. Seasonality denotes shifts in prices, employment opportunities and food availability (DFID, 1999). Trends and seasonality can be positive for example when changes in consumer prices are lowered leading to the achievement of better livelihood outcomes.

The vulnerability context attracts focus on the complexities of influences which either directly or indirectly affect the livelihoods of the poor. It is difficult to make alterations on this part of the framework as it is determined by factors beyond the control of the poor such as policies (Haider, 2009). This is especially true in the short term where minimal changes could be done through, for example, legalizing the practice of urban agriculture. Livelihood diversification through the practice of urban agriculture can also reduce the vulnerability of urban households (Galhena et al, 2013). This ensures that households do not only depend on one source of income hence reducing their vulnerability and increasing their resilience to unfavorable livelihood conditions. Lynch et al's (2013) study in post-conflict Freetown, Sierra Leone found urban agriculture to be an important livelihood strategy in the rebuilding of communities and civil society, particularly in the areas around the main production sites. Jongwe's (2014) study in Gweru, Zimbabwe also revealed that households engaged in urban agriculture to reduce their vulnerability to food insecurity during the country's hyperinflation period in 2008. Urban agriculture can, therefore, play an important role in reducing the vulnerability of urban households.

3.2.2 Livelihood Assets in the SLF

Livelihood assets are presented in a pentagon (see Figure 3.1) which schematically shows the variation in people's capitals. The term capital is not used in the strictest economic sense; rather, it denotes the important endowments of the poor. Ashley (2000) describes livelihood assets as the construction blocks of a livelihood which is considered as sustainable. Livelihood assets enable the poor to survive difficulties and sustain their needs. The capitals include natural, physical, human, social and financial capital. There have been debates on whether political, spiritual and political capitals should be included in the pentagon; however, a closer and deep analysis of social capital covers these aspects. Nonetheless, some international organizations implementing the SLF have come up with their own versions with additions, for example, Oxfam and CARE (Brockelsby and Fisher, 2003). The livelihood pentagon can be useful as an entry point of development interventions and policy debates as it offers a tool to visualise the settings in which the livelihoods of the poor take place and the dynamic changes which occur over time through regular rearrangements of the pentagon shape. The shape of the pentagon is used to illustrate vividly and graphically how access by different people to assets differs (DFID, 2000). The centre of the shape where the lines converge show nil access to assets while the outer part signifies maximum assets access (see fig 3.1).

Human Capital

Human capital refers to the "skills, knowledge, the ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives" (DFID, 2000:2). Human capital varies from household to household as it is determined by factors which include the number of people in the household and their levels of skills. Kollmair and Gamper (2002) argue that human capital is integral in enabling people to utilise other livelihood assets at their disposal. The accumulation of human capital can be supported directly for example by attending capacity building sessions and indirectly through policy change in the structures and processes framework. Sector programmes are the most appropriate mechanisms for building human capital as they are able to adopt interspersed approaches to human capital advancement through livelihood analysis (Rakodi and Jones, 2002). The ability to accumulate human capital is

also determined by the willingness of the concerned individual hence people should be willing to build their own human capital through utilising available opportunities.

Urban agriculture can improve human capital through its ability to promote health and well-being. Physical exercise is promoted through the cultivation of urban gardens which in turn is beneficial to muscle strength, lung capacity and the relief of stress (Lake et al, 2011; Taylor and Lovell, 2014). In a study conducted by Dunnet and Qasim (2000), sixty-four percent of the respondents considered gardening to be a good exercise. In poor households, visiting hospitals for medical treatment is often the last resort. Home gardens act as an important source of medicine for livestock and humans. Gelhana et al (2013) argue that herbs and medicinal plants grown in developing countries are used by nearly 80% of the people to treat various illnesses, diseases, and also to improve their health conditions. Human capital in the practice of urban agriculture is also improved through the work of NGOs and extension services, which is vital to the success of urban agriculture as a livelihood strategy (Jacobs, 2009).

Social Capital

Social capital in the SLF refers to the social resources which are at the disposal of people when seeking to fulfil their livelihood objectives. The World Bank (1998:1) defined social capital as:

> [T]he institutions, relationships, and norms that shape the quality and quantity of a society's social interactions...Social capital is not just the sum of the institutions which underpin a society; it is the glue that holds them together.

Social capital is closely related to the Transforming Structures and Processes box. DFID (2000) argues that structures and processes can be products of social capital; the relationship is two ways and can be self-reinforcing. This can happen when people who have linked through common norms and sanction influence the formation of new organizations to promote their interests (e.g. farmers associations). Social capital is an important insurance mechanism or coping strategy as it can help to mitigate the impacts of shocks or shortages of other capitals through depending on one's network.

Home gardening contributes to the accumulation of social capital through the creation of networks to trade, barter or donate garden products (Winklerprins, 2002). In Toronto, Canada home gardeners build relationships through sharing produce and discussing garden related topics

(Korthwright and Wakefield, 2011). Similar findings were revealed in the USA where African American, Mexican-origin and Chinese-origin gardeners said they shared food with neighbors, friends, family or even strangers (Taylor and Lovell, 2015). A study in Kenya found that cultivating households had a higher frequency of positive interactions with their neighbors, such as exchanging goods, food, cash and even services such as child-minding as compared to non-practicing households (Gallaher et al, 2013:396). However, social capital is not always positive as it can lead to the exclusion of non-group members due to a person's hierarchical position within the system (DFID, 2000). In the case of urban agriculture, vulnerable groups such as women in Africa can be excluded from access to markets, loans and prime land as a result of the patriarchal nature of some communities. Moreover, social capital can be eroded when urban farmers begin to compete for few markets, leading to the straining of relationships (Olivier, 2015). Social capital can be strengthened through reinforcing local institutions through the promotion of capacity building and the creation of environments which foster the growth of social capital in communities.

Natural Capital

Natural capital is a term used to describe the natural resources which people depend on for their livelihoods which can either be tangible or intangible. Natural capital can be divided into renewable and non-renewable. Guerry et al (2015:7349) define natural capital as "the living and nonliving components of ecosystems—other than people and what they manufacture—that contribute to the generation of goods and services of value for people". Natural capital is important especially in the lives of the poor who derive all or a major part of their livelihoods from the natural resource base. The availability and accessibility of land as a natural capital is crucial for viable urban agriculture. Natural capital can be improved either through the direct or indirect support of Transforming Structures and Processes, especially through legislation which enables people to use the natural capital sustainably, such as the Bulawayo Urban Agriculture Policy (BCC, 2008). In Havana, Cuba, government support made land available for urban cultivators through negotiating with private landowners (Altieri et al, 1999). Urban agriculture is not only dependent on the availability and accessibility of natural capital but it can also improve the state of the natural capital such as air through greening the urban space (Lake et al, 2011).

Natural capital is important for survival as food and air are derived from this important livelihood asset.

Physical Capital

Physical capital encompasses the producer goods and basic infrastructure needed to support livelihoods. Examples of physical capital include affordable access to water and sanitation and shelter. Infrastructure describes public goods that are enjoyed without forthright payment with only a few exceptions (e.g. toll gate road revenues) (Haider, 2009). Physical capital, like other livelihood assets, is important as it is directly interrelated to the other four assets. Lacking physical assets such as safe water and sanitation can affect the health and well-being of the poor, leading to the deterioration of human capital. Pettersen and Pedersen (2010) argue that the opportunity costs which arise as a result of poor infrastructure can prevent investment and income generating activities thus constraining the productive capacities of the poor. The scarcity of water can be crippling to the practice of home agricultural production (Moyo, 2014; Kutiwa et al, 2011). In the Eastern Cape, South Africa, a study of small-scale cultivators found that farmers were forced to sell their produce below the unit price to traders because the roads were poor, telecommunications were unavailable and the cultivators had no transport (Nel et al cited in Olivier, 2015). The inadequacy of infrastructure, therefore, is a stumbling block to the full growth and development of urban agriculture.

Financial Capital

The financial resources which people use in the pursuit of their desirable livelihood outcomes are known as financial capital within the livelihood asset pentagon. The definition of financial capital in the SLF is not in the economic sense but it reflects the relationship between financial capital and livelihoods as it tends to include flows as well as stocks and it can contribute to production and consumption at the same time (Tao and Wall, 2009). The two main sources of financial capital are available stocks and regular inflows of money. The available stocks comprise savings which can be held in several forms such as cash, bank deposits or liquid assets such as livestock and jewelry. Common types of regular inflows of money include pensions or

other transfers from the state, and remittances which must be reliable in order to have a significant impact on the livelihood outcomes of the poor (Scoones, 1998).

Financial capital is the most versatile of the five livelihood assets as it can be used directly for the achievement of livelihood outcomes (e.g. when food is purchased to reduce food insecurity) (DFID, 2000). Urban agriculture can act as a source of financial capital through its ability to provide employment. In cities such as Dar es Salaam, urban agriculture was the second largest employer (20% of those employed) and it forms at least 60% of the informal sector (Jacobi, 2000; Cofie, 2013; RUAF Foundation, 2017). Lack of financial capital can limit the growth of urban agriculture as farmers need money to purchase seeds, fertilizers and other farming equipment (Mkwambisi et al, 2011; Moyo, 2014; Kutiwa et al, 2014). The accessibility of financial capital can be improved through microfinance which should be accompanied by the removal of collateral barriers experienced by poor people and the creation of safety nets by governments for the benefit of the poor.

3.2.3 Transforming Structures and Processes

Transforming Structures and Processes (TSPs) refer to the institutions, organizations, policies and legislation that shape livelihoods (McLennan and Garvin, 2012). They operate from the household to the international level determining the terms of exchange between capitals and different livelihood strategies. They are located in the centre of the livelihoods framework and they directly give feedback to the vulnerability context. Structures are best described as the hardware which is responsible for setting and implementing policy and legislation, delivering services which affect people's livelihoods (DFID, 2000). They are legitimized by governance frameworks and can exist at a governmental and private level. Poor working structures are a stumbling block to sustainable development as they tend to impede asset creation and implementation of various livelihood strategies. Processes complement structures and they are best described as the "software" determining the way in which the hardware and people operate and interact (DFID, 1999). Important processes for sustainable livelihoods include power relations, policies, legislation and institutions. Processes can motivate or influence the choices of people and their access to different types of assets.

Transforming structures and processes usually discriminate the poor as a result of elite capture and there is a need for them to be transformed. Brockelsby and Fisher (2003) argue that external

support can be solicited to assist in the building of structures for the poor through advocacy and lobbying. The TSPs are important in the urban agriculture context as they play a role in the provision of land, inputs and the marketing of produce. Urban agriculture policies can ensure the expansion of agricultural activities and improved food security. The Urban Agriculture Policy of the City of Cape Town, for example, legitimizes all public support for UA in Cape Town, such as the provision of free public land, fencing and infrastructure, and inputs (Olivier, 2015). Similarly, the Bulawayo Urban Agriculture Policy makes provisions for land access, training and technical advice for urban farmers (BCC, 2008). Restrictive institutions which treat urban agriculture as an illegal activity reduce the benefits which can be potentially realised by urban dwellers.

3.2.4 Livelihood strategies

Livelihood strategies are the various activities which people engage in to realise their livelihood objectives (DFID, 2000). Livelihood strategies may differ from household to household and they are the dynamic processes which people use in pursuit of their livelihood outcomes. Ashely (2000) posits that people are many times compelled to compete for resources which are in short supply hence the fundamental of livelihood approaches should be propelled by the need to enhance the livelihood strategies of the people in a sustainable manner. The livelihood strategies of the people can be developed through facilitating the expansion of choice and values that can provide people with freedom of self-sufficiency and adjustability over time. This can be done by improving the asset base of the poor which are the building blocks for a sustainable livelihood for example through land reforms and access to microfinance in order to boost the financial capitals of people. Urban agriculture is one of the many livelihood strategies that urban people engage in to improve their household well-being and reduce their vulnerability to shocks.

3.2.5 Livelihood Outcomes

Livelihood outcomes refer to the desirable accomplishments or outputs which result from pursuing different livelihood strategies (DFID, 2000). Livelihoods outcomes are important because they assist in facilitating understanding of why people engage in particular activities and what they hope to achieve from such livelihood options and how they can adapt to new entry points (FAO, 2016). Examples of livelihoods outcomes can include increased income, reduced

vulnerability, increased well-being, and improved food security, more sustainable use of natural resources which can be promoted through participation in urban agriculture. The livelihood outcomes are not the end of sustainable livelihoods as they feed into the future livelihood asset base hence continuing the cycle. They are important in building and strengthening the capitals in the asset pentagon.

3.3 Applicability of the framework

The SLF's applicability in this study on urban agriculture is rooted in its core principles. The SLF is a people-centered framework which focuses on people and the resources that are at their disposal. Scoones (1998) argues that the SLF seeks to work with people to identify their livelihood strategies and the changes they have experienced over time. People-centeredness in the SLF is further ingrained in the positive aspect that sustainable poverty alleviation can be successfully achieved when development agents work with people and their abilities to cope and adapt livelihood strategies over time (DFID, 2000). This people-centered approach is complemented by its participatory nature which results in proper prioritization of projects and programmes to meet the felt needs of the poor. The SLF shifts focus from mere results or outcomes to people and it, therefore, demands an investigation into the priorities of the stakeholders.

The SLF is an attractive holistic poverty assessment tool. This is important in an era of an increase in the urbanisation of poverty. The SLF inclusively looks at the livelihoods of the poor in totality, not just on some individualistic aspects on diverse people. Serrat (2008) argues that the holistic nature of the framework assists users to understand the complexities of poor people's lives, the challenges that they encounter, and the vulnerabilities they are exposed to on a daily basis. The holistic nature of the SLF is crucial in its ability to recognize that multiple actors play a pivotal role in impacting on the lives of the poor be it the private or public sector. The SLF's holistic nature is able to facilitate understanding on different groups of people and offers a broad understanding of their livelihood which makes it an appealing approach in the development arena. The understanding on people's livelihoods is further enhanced by the dynamic nature of the SLF. Bennet (2010) argues that the dynamic core principle of the SLF acknowledges that people's livelihoods and the institutions that shape them are highly dynamic, diverse and they have different background circumstances which makes it context specific.

The sustainable livelihoods approach, unlike other conventional poverty alleviation approaches, focuses on the strengths of people. Building strengths of people is an important principle which treats stakeholders with dignity as they have something positive to contribute rather than being mere objects depending on external packages. Eddins and Cotrell (2014) argue that that the focal point of the framework is the recognition of the poor's ability to overcome their constraints and achieve their livelihood objectives. The framework's vivid illustration of the asset pentagon is significant in pinpointing the various strengths that people already have and how external interventions can further aid people to build on such strengths. However, it should be understood that the approach is not necessarily dependent on external intervention as it can be possible for individuals and groups to analyse their own livelihoods.

The SLF places focus on the relationship between the macro and micro processes. The SLF works as a bridge between the micro and macro levels of development by stressing the important relationship that these two have for effective poverty alleviation. This is also compelled by the enormous challenge of poverty which cannot be tackled by blindly focusing on only one level of development. Carney (2002) propounds that livelihood approaches promote the explicit need for consideration of local development issues such as resource allocation to the macro level which implements policies and laws which can affect the asset bases of the people or their livelihood strategies as well as increasing or reducing their vulnerabilities to shocks, trends and seasonality. The macro-micro links relationship can be used to show how urban agriculture policies implemented at a macro level affect the livelihoods of households at the micro level. The SLF consequently encourages the macro-level to debate on policies which can enable people to build on their strengths for sustainable development.

The SLF is a holistic analytical framework which draws attention to the principal influences and processes that affect the livelihoods of the poor. This makes the approach appealing to this research project as it was useful in ascertaining and understanding the livelihood strategies that home gardeners undertook and the capitals which they drew upon for their survival. The SLF provides a checklist of important issues which affect livelihoods. It was useful in highlighting the barriers and obstacles which impede the full realisation of desirable livelihood outcomes of home gardeners. The sustainable livelihoods approach is properly placed to fulfil the objectives of the research topic through its capabilities of allowing the researcher to think out of the box on development issues leading to the gathering of rich and holistic data (Serrat, 2008). The checklist

of important issues affecting the livelihoods of the people is highly significant in supporting the access of people to assets and developing enabling environments for the flourishing of urban agriculture which will be encouraged by policy recommendations.

3.4 Complexities associated with the SLF: A critique of the framework

The Sustainable Livelihoods Framework despite its strengths has some pitfalls. The framework has been accused of being complicated as a result of its components. Clarke and Carney (2008) argue that the components of the SLF make it difficult to conduct an in-depth analysis thus resulting in the approach being viewed as too broad and superficial. They further argue that the SLF often mismatches with the organization of practical development work. Morse and McNamara (2013) concur with Clarke and Carney and state that the SLF can be a bit beyond some concrete realities of many local development managements. However, whilst this criticism may hold water it is noteworthy that the many components of the SLF make it more attractive in project design as it enables users to gather rich data. This loophole can also be overcome by ensuring that all stakeholders are involved right from the project design to its completion. Simplifying the approach to suit local contexts is also helpful in reducing complexities associated with the broad nature of the framework.

The SLF seeks to promote poverty alleviation but it fails to define who the poor are or how they can be identified. Krantz (2001) argues that the DFID sustainable livelihoods framework explicitly states that what constitutes poverty and defining poverty should not be pre-determined; rather, it should come out in the work of evaluating livelihoods according to the framework. The DFID (2000) posits that identifying poverty should be accompanied by participatory poverty assessment methodologies, gender analysis as well as stakeholder analysis. Poor people could be identified through selecting a physical location where poverty is rampant and assume that most people in that area are poor but this creates challenges as poverty cannot be uniformly distributed (Krantz, 2001). This weakness can be curbed by acknowledging that the SLF cannot be a standalone framework when it comes to the conceptualization of poverty.

The SLF has been criticized for ignoring gender and power relations. Snidder (2012), for example, argues that inequality in power relations is often manifested in the relationships that women and men have at household levels. Whilst the three internationally accepted SLFs from the UNDP, CARE and DFID are gender sensitive, as they seek to collect gender disaggregated

data and give particular attention to the vulnerable, they fail to meet the needs of women in particular (Tao and Wall, 2009). However, ensuring that gender is addressed in principle is different from it being implemented practically to meet specific livelihood issues. This is the problem encountered by all participatory methodologies mainly as a result of the productive roles of women which make them have little time to attend consultative meetings and activities. The transforming structures and processes box (see Figure 3.1) mentions the role played by culture in influencing the livelihood strategies and outcomes of poor people. This is useful in the analysis of gender relations which are determined by culture, especially in the Zimbabwean context.

The SLF ignores the role of the markets and the economic contexts of livelihoods. Scoones (2009) reveals that there has been a decline in the use of livelihood perspectives as a result of their failure to take into cognisance processes of markets and economic globalisation. Carney (2002) attributes this neglect of market forces to the lack of background in economics by the implementers of the framework. Markets are important in the daily activities of the poor as they make economic decisions for example when they decide to choose the types of goods they sell or when they choose to cultivate cash crops over food crops. Economic decisions are therefore affected by the functionalities and structures of markets. Inefficient markets which are characterised by high transaction costs impact negatively on the livelihoods of the poor. However, for the purposes of this study, the roles played by market forces on the livelihoods of the people were not ignored. The role of the markets was strategically included in the livelihood analysis using the transforming structures and processes box of the framework.

3.5 Summary

This chapter has highlighted how the SLF provides the theoretical framework of this study. The framework is useful in highlighting the various capitals that are possessed by home gardeners and the challenges that they experience. This chapter described in detail the components of the SLF and their applicability to the present study on home-based agricultural production in Bulawayo. The chapter also gave detail on the strengths and weaknesses of the framework. The measures to be taken to address the weaknesses of the framework were also highlighted. The following chapter focuses on the study's research methodology.

CHAPTER 4: RESEARCH METHODOLOGY

4.0 Introduction

This chapter presents the research methodology followed in the study. It provides details on the research population, the sampling criteria used, and the rationale on why these were chosen. The research instruments used for data collection and the reasons behind their choice are discussed. The data analysis and presentation procedures employed in this study are also highlighted. Finally before the chapter summary, the ethical considerations followed by the researcher during the data collection process are presented.

4.1 Research design

Research design can be best described as the blueprint or logic which sheds light on how the study will be conducted. Thomas (2010) argues that the research design reveals all the major parts of a research study which include the sample size, data collection methods and analysis as well as how these were used in order to answer the research question. Van Wyk (2012:1) postulates that the "… research design is an overall plan of connecting the conceptual research problems to the pertinent and achievable empirical research." The research design can, therefore, be thought of as a framework which is constructed to ensure that the research questions are answered and the aim of the research is achieved. Singh (2006:77) states that the research design essentially includes objectives, sampling, research strategy, tools and techniques for collecting the evidence, analysing the data and reporting the findings.

4.2 Research Methodology

Research methodology is defined as a systematic way of solving a research problem (Rajaseker, 2006). It focuses on how the research is carried out from the initial identification of the problem until the final conclusions (Singh, 2006). The field of social sciences has been dominated by quantitative and qualitative research approaches. In the last 20 years, mixed methods have become a more widely utilised approach to inquiry (Creswell and Garret, 2008). Mixed methods emerged as an attempt of combining the strengths of qualitative and quantitative research in order to facilitate a better understanding of the research problem.

4.2.1 Quantitative research methodology

Quantitative research involves the collection of numerical data so that the data can be quantified and tested for statistical significance to support or refute "alternate knowledge claims" (Creswell, 2008:9). Mathematically based models are used as the methodology of data analysis (Williams, 2007). Quantitative research seeks to answer questions such as how many, how much, and to what extent through quantification (Rahman, 2017). Quantitative data can be generalised and its analysis is less time consuming as statistical software such as SPSS and STATA can be used for data analysis. This research is largely quantitative in nature and the main focus was on descriptive statistics. Quantitative research in this study was particularly useful in the assessment of the influence of variables such as employment status, household income and education to household food security. However, quantitative research can leave out important characteristics of a research population such as their perceptions, beliefs and motivations which cannot be meaningfully reduced to numbers (Choy, 2014; Rahman, 2017). Quantitative research also requires the use of large sample sizes for the testing of statistical significance which presents challenges for researchers with limited financial resources.

4.1.2 Qualitative research methodology

Qualitative research is a holistic approach that involves the discovery or exploring of a phenomenon (Williams, 2007). Qualitative research focuses on the understanding of an aspect of social life through generating words rather than numbers for data analysis (Clarke and Braun, 2013; Choy, 2014). The qualitative researcher collects open-ended emerging data for the purpose of developing themes from the data (Creswell, 2008). Qualitative research derives its primary strength from the ability to assess cultures through probing underlying values, beliefs and assumptions (Choy, 2014). It provides in-depth and detailed descriptions of participant's feelings, opinions and experiences (Johnson and Onwuegbuzie, 2004; Williams, 2007). Qualitative research studies behavior in natural settings, usually using people as sources of data (Hancock et al, 2007). In this study, qualitative research was particularly useful in investigating the motivations behind the practice of urban agriculture, the perceptions of urban residents on the Bulawayo Municipal Urban Agriculture Policy, and the challenges experienced by urban farmers in Bulawayo. However, the major criticism leveled against qualitative research is that the results of a qualitative study may not be generalizable to a larger population due to small sample sizes

(Hancock et al, 2007). Qualitative research can also be labour intensive and expensive to administer. It is against this background that mixed methods were used in this study so as to enable the strengths of quantitative and qualitative research to complement each other.

4.2.3 Mixed Methods research methodology

Mixed methods are an "…emergent methodology of research that advances the systematic integration, or "mixing" of quantitative and qualitative data within a single investigation or sustained program of inquiry" (Wisdom and Creswell, 2013:1). Creswell (2008:9) defined mixed methods as "…both a method and methodology for conducting research that involves collecting, analysing, and integrating quantitative and qualitative research in a single study or a longitudinal program of inquiry". The data collection in this approach is both quantitative and qualitative which can be implemented either simultaneously or sequentially to best answer the research questions.

The mixed methodology approach is important in providing a better understanding of a research problem by employing both qualitative and quantitative data as they can complement each other to come up with a more holistic picture. The approach is instrumental in offsetting the weaknesses of both the qualitative and quantitative research methods which enhance the validity of the research study (De Lisle, 2011; Malina et al 2011; Bamberger, 2012). However, the mixed methods approach has setbacks in that it can be time-consuming, labour intensive and expensive which can be a problem to researchers working under constrained budgets and time (Driscoll et al, 2007; Wisdom and Creswell, 2013). There are also potential risks of loss of depth and flexibility that occurs when qualitative data is converted into quantitative but these weaknesses were overcome through giving careful and thorough consideration of the type of data collected in order to properly address the study's research questions (Bazeley, 2004).

4.2 Data Collection Instruments

4.2.1 Quantitative data collection methods

Structured questionnaires

Structured or close-ended self-administered questionnaires were used to collect the quantitative data required for this study. The quantitative part of the research sought to measure household

vulnerability to food insecurity and the livelihood strategies that households practice in order to ensure food security. The quantitative variables were mainly socio-economic as well as the HFIAS score. The researcher administered 99 questionnaires in the sampled ward. The questionnaires were used to collect data such as the socio-economic and demographic details of participants, their reasons for engaging in home-based urban agriculture, household food security assessment and their livelihood diversification strategies. The sample size was derived statistically using Yamane's sample size determination formula and a table of random numbers generated on the internet was then used to select the households using house numbers. Self-administered questionnaires allowed the respondents to have adequate time in order to give well-thought out answers (Bloch, 2004; Singh, 2006). Close-ended questionnaires were also chosen as data collection instruments for this research study as they are cheap and have standardized answers which facilitate easy data compilation (Bird, 2009). However, close-ended questionnaires have demerits which include that they require a literate population which is able to read and understand the questions and write down the replies. There was a low probability of meeting someone who cannot read and write in Bulawayo as it is one of the most literate cities in Zimbabwe. The respondents who had challenges in answering the questions were free to ask the researcher for assistance in administering the questionnaires.

4.2.2 Qualitative Data Collection Methods

Semi-Structured Interviews

Semi-structured interviews were used in order to gather in-depth data from the urban cultivators and key informants. The qualitative part of the study focused on the perceptions of study respondents being guided by questions on their sources of motivation for participation in urban agriculture, food security coping strategies and their livelihood diversification strategies. Initially twenty urban gardeners were supposed to be interviewed but the researcher stopped at ten as it was difficult to get hold of most of the respondents. This was done after administering questionnaires and the more experienced farmers were then purposively selected for the interviews. This particular type of interview was chosen for this study as it is flexible and allows the interviewee to provide more information. Zohrabi (2013) argues that semi-structured interviews are neither too rigid nor too open which makes it be the most preferred type of interview. Semi-structured personal interviews were also beneficial in that the researcher was able to judge the quality of responses to notice if the questions were being properly answered and

explained further if the respondents were encountering difficulties in answering questions (Cohen and Crabtree, 2006; Walliman, 2011; Blandford, 2013). Interviews can, however, introduce bias which tends to affect the reliability of the data with respondents giving information which is socially acceptable. This was minimised by giving adequate time to the drafting of the interview guide and thoroughly explaining to the research participants the purpose of the study.

Key informant interviews were to be conducted with experts from the Local Council Department of Residential Planning and Development, the Cowdray Park Councilor and the Residents Chairperson; however, the researcher failed to meet the Local council representative and councilor due to bureaucracy and time constraints. Resultantly, two NGO officials from the Zimbabwe Democracy Trust, which supports urban agriculture in Bulawayo, were interviewed. A Resident Association Representative was also selected as a key informant. The key informants were chosen because they had experience in working with the local community on urban agriculture related issues and are familiar with the area of study as they are residents in Cowdray Park. The key informants were asked questions relating to the support they are offering to the urban farmers and their understanding of the reasons behind the growth of urban agriculture in Bulawayo.

Focus Group Discussion

Focus group research is defined as an organized discussion conducted with a selected group of individuals in order to gain insights on their views and experiences on a specific topic (Gibbs, 1997). A Focus Group Discussion (FGD) can be understood as a type of in-depth interview conducted in a group setting "whose meetings present characteristics defined with respect to the proposal, size, composition, and interview procedures" (Freitas et al, 1998:2). For the purposes of this study, one FGD was conducted with purposively sampled home-based farmers. The FGD comprised of 8 farmers who were practicing some form of home-based agricultural production in Cowdray Park. The FGD posed questions relating to the contribution of urban agriculture to their household food security and livelihoods, the motivations behind their practice of urban agriculture, and the challenges that they face in the Bulawayo context. Gibbs (1997) argues that FGDs are particularly suitable for obtaining several perspectives about a specific topic. They permit a rich and flexible way of collecting data at the same time permitting spontaneity of interaction among the participants (Freitas et al, 1998). The FGD enabled the researcher to

interview the study population in their natural setting. In combination with participation observation, the FGD was important in enabling the researcher to get a shared understanding of the farmers on issues pertaining to urban agriculture. The questions were translated to the local isiNdebele language to enable easy understanding.

The advantages of an FGD also include that it produces data and insights that would be less accessible without interaction found in a group setting. Listening to others' verbalised experiences stimulates memories, ideas, and experiences in participants (Lindlof and Taylor, 2002). Focus group discussions are also low in cost and data collection is relatively quicker as many people can be addressed in one group discussion. Merriam and Tisdell (2016) however noted that FDGs can have a drawback when one individual is dominating and more vocal as compared to other participants. This weakness was addressed by emphasizing before and during the discussion that all people were free to participate. The moderator was always conscious and followed the FGD guide which was prepared beforehand so that the research questions were properly addressed.

4.3 Population and Sampling

The term population in research is used to describe the total quantity of cases which are the subject of study (Walliman, 2011). The targeted population for this study was urban households in Bulawayo. Ward 28 was purposively sampled for the research study due to time and resource constraints. This ward was also purposefully sampled because it has the second highest poverty prevalence rate of over 40 percent in Bulawayo and urban agriculture research in this particular ward is limited (ZimStats, 2015). Purposive sampling was also used for the qualitative part of the research. Purposive sampling is defined as the process of selecting subjects on the basis of similar characteristics and the researchers own judgment (Etikan et al, 2016). Ten home-based farmers were interviewed in areas concerning the motivations behind their practice of urban agriculture, their challenges and understanding of the Bulawayo Municipal Council Urban Agriculture Policy. The qualitative data was then used to complement and bring depth to the quantitative data; hence the chosen sample number was adequate for reaching a point of saturation. The researcher deliberately selected participants who were well-informed on the research problem and were willing to participate in the study (Etikan et al, 2016). The purposive sampling technique, however, has a limitation in introducing researcher bias which can affect the credibility of the research. The researcher made efforts to reduce or eliminate bias through the

use of probes to uncover deliberate fabrications and staying focused on the research objectives of the study (Shenton, 2004).

Simple random sampling was employed for the quantitative part of the study. Simple random sampling is defined as a sampling technique in which every case in the population has equal chances of being selected (Singh, 2011). This sampling method is advantageous in that it is free from subjectivity and the observations from the sample can be used for inferential purposes (Kothari, 2004). Households, instead of the total population of individuals, were used as this study is centered on household food security. The number of households in Ward 28 are 11 342 (ZimStats, 2012). The sample size was derived statistically using Yamane's sample size determination formula ($S = \frac{N}{1+N(e)^2}$) Where S= Sample size, N=population and e=margin of error (Israel, 2009). A table of random numbers generated on the internet was then used to select the households sampled for the study. Considering a confidence level of 90% and margin of error of ±10% the sample size of the study was determined as follows:

$$\frac{11{,}432}{1 + 11{,}432\ (0.1)^2} \quad \therefore \frac{11{,}432}{115.32} = 99\ households\ \ were\ sampled.$$

4.4 Data Analysis

Creswell and Clark cited in Onwuegbuzie and Combs (2011:4) argue that "Data analysis in mixed methods research consists of analysing the quantitative data using quantitative methods and the qualitative data using qualitative methods". This study employed the explanatory sequential design mixed methods approach. The researcher first collected and analysed quantitative data. This was followed by the collection and analysis of qualitative data to elaborate and give breadth to the quantitative data (Wisdom and Creswell, 2013). The rationale for this approach is that the quantitative data and its analysis provide a general understanding of the research problem whilst the qualitative data explains the statistical results through exploring the views of the research participants (Creswell, 2003). The advantages of using this approach include its simplicity, straightforwardness and opportunities for exploring the quantitative data in detail which outweighs the time constraints limitations (Ivankova et al, 2006). The data was then visually presented using tables, graphs and pie charts.

4.4.1 Quantitative Data Analysis

Quantitative data analysis for this study sought to numerically present the data collected through questionnaires. The data was first coded and transferred from the questionnaires to an excel spread sheet. The data was read and re-read in comparison with the questionnaires in order to detect data entry errors. The excel spread sheet was then imported to STATA 12.1 for analysis. Descriptive statistics were done by analysing one variable at a time (univariate analysis) in order to describe the data (Patel, 2009). This was done by using the tab command to come up with tables showing the frequency and percentages of the variables. Measures of central tendency were utilised to describe the socio-demographic and economic data such as age, education and household income. To describe two variables the data was cross tabulated. Inferential statistics were used to test relationships between two or more variables.

4.4.2 Qualitative Data Analysis

Quantitative data analysis is a process which seeks to reduce and make sense of vast amounts of information, often from different sources (The Open University, 2017). Qualitative data analysis pays attention to the spoken word, the context, frequency, intensity of comments, emerging themes and trends. The researcher used thematic analysis to analyse the qualitative data. The six steps of qualitative data thematic analysis, as suggested by Braun and Clarke (2006), were employed for the purposes of this study.

1. **Familiarising with data**

   The interview recordings were listened to and translated from the local Ndebele language which was followed by verbatim transcribing. The researcher then read and re-read the transcriptions whilst making notes and writing down short summaries of each transcription. This step laid a foundation for the subsequent analysis of qualitative data.

2. **Generating initial codes**

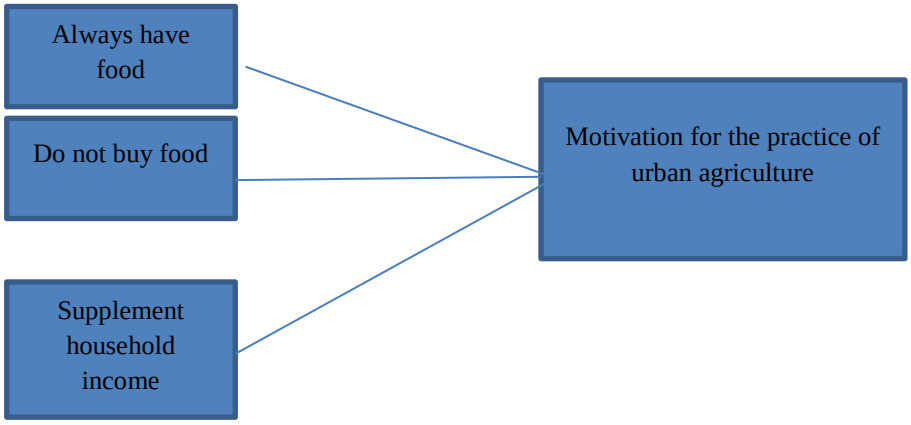
   After the researcher had familiarized herself with the data she started identifying preliminary codes guided by the research questions. The transcriptions were then divided and organised according to the codes identified. The codes were written down on small pieces of paper and arranged on top of a table.

3. **Searching for themes**

   The identified codes were then grouped into a cluster of themes. Codes were combined or split depending on the themes identified. This led to a reduction of codes to form

manageable themes. A basic theme on the **reasons behind the practice of urban agriculture** emerged for example after combining codes *always have food*, *do not buy food* and *supplement household income* as illustrated (see fig 4.1).

Figure 4.1: Codes to a basic theme



Source: Adapted from The Open University (2017)

4. **Reviewing themes**

The basic themes identified were then arranged and reviewed. The researcher questioned herself on how to combine, discard and separate the themes which were initially identified. New emerging themes were identified and organised into a broader theme leading to further data reduction.

5. **Defining and naming themes**

This step involved verifying, refining and defining the broad themes and potential sub-themes within the data. The researcher at this stage came with names for the broad themes and created working definitions for them in line with the research objectives.

6. **Producing the report**

The final step done in the qualitative data analysis process was transforming the themes into interpretable information relating to the research questions and literature. The interpreted information was then used to give depth and explain the quantitative part of the study.

4.5 Ethics statement

This research targeted human beings as participants hence ethical considerations were of paramount importance. The study only commenced after approval ethical clearance from the University of the Western Cape's, Economic and Management Sciences Higher Degrees Committee, and the Senate Higher Degrees and Ethics Committees. Babbie (2007) argues that the ethics of social science research are hinged on informed consent, ensuring that there is no harm or risk of the participant's privacy, confidentiality and anonymity.

1) Informed consent

The researcher designed a consent letter which was signed by both the researcher and the participant. Biber and Leavy (2011) posit that a detailed informed consent letter should include the purposes of the research, its duration, a statement describing the extent of confidentiality as well as the disclosure of known or foreseen risks together with measures of ameliorating such risks if possible. The researcher ensured that the consent letter was detailed and well explained to the participants before the process of data collection begun. The consent letter was also accompanied by an information sheet with details on the objectives of the study, the researcher's and supervisor's contact details which could be used by the research participants if they needed further clarifications.

2) Harm and risk

The researcher ensured that all the participants were not harmed physically, emotionally, psychologically and materially by the research. The research participants were not exposed to harm and risk by participating in the research. The researcher was always alert and took extra precautions to ensure that harm and risks were not inflicted subtly.

3) Privacy, confidentiality, and anonymity

The researcher did not ask the participants to write their names on questionnaires or take their pictures so as to ensure anonymity. Pseudonyms were used instead of the participants' real

names. The participants were also assured that the research findings will only be used for academic purposes.

4) Voluntary participation

The targeted population was not coerced to become part of the study. The researcher informed the participants that they could choose not to participate in the study before and continuously throughout the duration of the study.

4.6 Summary

This chapter was mainly a discussion of how data was collected, and why the researcher chose the data collection tools used. The information on the sample population and the sampling criteria were also discussed. The chapter further highlighted the ethical considerations and the data analysis procedures. The following chapter focuses on data analysis and presentation. The following chapter discusses how the empirical data gathered through the methods discussed in this chapter helps to address the research questions.

CHAPTER FIVE: DATA PRESENTATION, INTERPRETATION AND ANALYSIS

5.0 Introduction

This chapter is centered on the presentation, interpretation and analysis of the findings of the study. The chapter seeks to answer the research questions on the contribution of home-based agricultural production to household food security and livelihoods. The questions on the determinants of household participation in home-based agriculture and the challenges that home gardeners encounter are also addressed through the research findings presented in this chapter. The findings are condensed through the use of graphical illustrations, pie charts, tables and direct quotations. The results of the study are further analysed and discussed with reference to previous studies on urban agriculture.

5.1 Characteristics of Urban farmers in Bulawayo

This mixed methods research study was comprised of a total of 118 respondents. The quantitative part of the study had 99 respondents who completed structured close-ended questionnaires. The qualitative part of the study included 10 in-depth interviews with purposively sampled farmers (8 women and 2 men) who had participated in the quantitative part of the study. One FGD was conducted with 8 women urban gardeners engaging in different types of home-based agricultural production. The FGD participants were purposively sampled from the questionnaire list. Key informant interviews were conducted with 2 NGO officials from the Zimbabwe Democracy and Development Trust (1 male and 1 female) and a female representative of the Residents Association. Urban gardeners in Bulawayo are largely women, youthful, unemployed, and have low incomes. The socio-economic characteristics of urban farmers are elaborated on below.

5.1.1 Gender

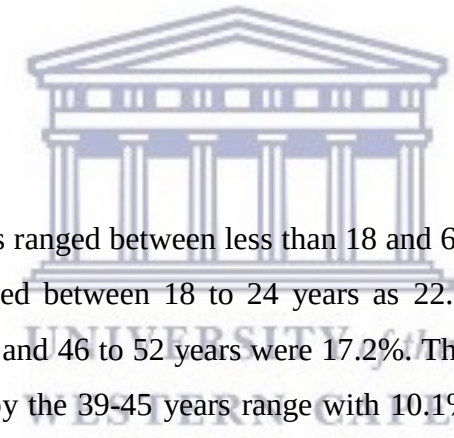
The study respondents were dominantly female making up 63.6 percent of the total research population. The male respondents comprised 36.4 percent of the study. It is clear that urban agriculture in the Bulawayo context is female dominated which also seems to be the case in other developing and developed countries (Uganda, Tanzania, Zambia, New Zealand and the USA) (Maxwell, 1995; Fouken, 2006; Lake et al, 2011; Taylor and Lovell, 2011). Women are

considered as the custodians of food security as they are mainly responsible for purchasing and preparing food, hence it is not surprising that home-gardening is a female domain in Bulawayo. Socio-cultural expectations and the division of gender roles ascribe the responsibility of household sustenance to women (Sebata et al, 2014). Home-gardening is also often an extension of the roles and responsibilities of women to ensure household well-being due to its close proximity to the home (Winklerprins and Souza, 2005).

Table 5.1: Distribution of respondents by gender

Gender	Frequency	Percentage
Male	36	36.4
Female	63	63.6
Total	99	100

Source: Author's compilation based on field survey



5.1.2 Age

The age of the home-gardeners ranged between less than 18 and 60 or above years. The majority of the urban farmers were aged between 18 to 24 years as 22.2% were in this range. Those between 25 to 31 years of age and 46 to 52 years were 17.2%. The 32 to 38 years age range had 16.2% respondents followed by the 39-45 years range with 10.1% and those less than 18 years with 9%. The 53 to 59 years age range had 6% of the respondents followed by the 60 and above age range with only 2%. The age ranges of urban gardeners in other Zimbabwean cities are slightly different from the Bulawayo context as they tend to be more elderly (36-45 years in Chinoyi; 40-60 years in Mutare; and Harare) (Pedzisai et al, 2014; Mrema and Chitiyo, 2011; Chadyiwanembwa, 2012). The age ranges of home-gardeners in other countries also tend to be elderly (South Africa, 60 and above, according to Breitenberg and Schuurman (2013)), and 50-60 years in Montreal and Paris (Pourias et al, 2016). The population of home-gardeners in the study was very youthful. Youth is associated with the physical ability to work in a garden which might not be possible for older people. The population of Zimbabwe especially in urban areas is largely comprised of youths. The percentage of youth population in Zimbabwe is 77% (ZimStats, 2012). Youth make up a large proportion of unemployed population in Zimbabwe which has led

some to turn to home gardening as a source of employment. Furthermore, the division of household chores by age could also be another possible explanation for the youthfulness of home gardeners. Finally, Zimbabwe's long economic crisis accompanied by high unemployment could be another factor in explaining the large percentage of youth engaged in home gardening.

Table 5.2: Age distribution of urban farmers

Age group	Frequency	Percentage
Less than 18 years	9	9.1
18-24 years	22	22.2
25-31 years	17	17.2
32-38 years	16	16.2
39-45 years	10	10.1
46-52 years	17	17.2
53-59 years	6	6
60+ years	2	2
Total	99	100

Source: Author's compilation based on field survey

5.1.3 Marital status

The majority of respondents, 48.5% were married. This was followed by 37.5% respondents who were single whilst 12.2% of respondents were widowed. Only 2% of the urban farmers were divorced or separated. Married people are more likely to have children to provide for so their participation in urban agriculture could be instrumental in supplementing incomes and boosting household food security.

5.1.4 Education

Table 5.3 indicates that a majority of the urban gardeners (41.4%) had completed ordinary level. This however, does not mean that they had passed (5 ordinary level passes) to get a job or proceed further with tertiary education. This range was followed by 22.2% who had university degrees. Those who did not have any formal education were 10.1% and those who had only completed primary school education were also 10.1%. The respondents who had completed advanced level were 12.1% whilst those who had completed vocational training were only 4.4%.

Most of these graduates were unemployed which is not surprising as Bulawayo has the highest unemployment rate of 33.8% in Zimbabwe (ZimStats, 2015). The findings from other African cities are mixed; some home-gardeners are not highly educated while some are educated: for example, in Cape Town, South Africa (below grade 6) (Breitenberg and Schuurman, 2013), Mutare, Zimbabwe and Malawi (college and University certificate holders) (Mrema and Chitiyo, 2011; Mkwambisi et al, 2011), and in Bulawayo and Chinoyi (ordinary level or secondary education), (Sebata et al, 2014; Pedzisai et al, 2014). The practice of home-based urban agriculture in Bulawayo is not limited to illiterate people as most of the respondents have some form of education. The high percentage of farmers with university or college education is caused by both the accessibility of education in Zimbabwe and the high unemployment rates in Bulawayo.

Table 5.3: Distribution of respondents by level of education

Level of education	Frequency	Percentage
No formal education	10	10.1
Completed Primary	10	10.1
Completed Ordinary level	41	41.4
Completed Advanced level	12	12.1
Completed Vocational education	4	4.0
Completed University/college	22	22.2
Total	99	100

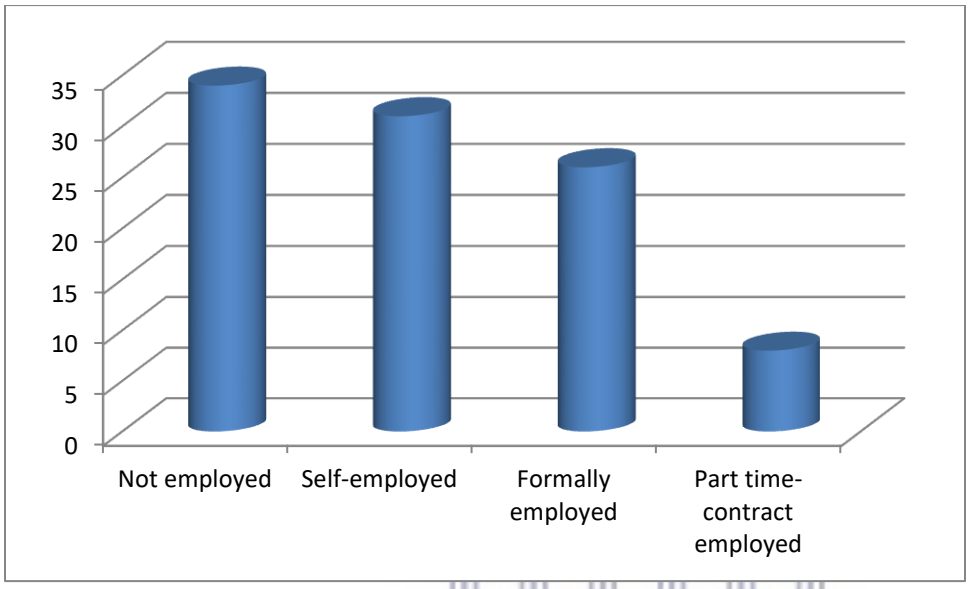
Source: Author's compilation based on field survey

5.1.5 Employment Status

The majority of study participants (34.3%) were unemployed. Those who were self-employed were 31.3%. The self-employed ran small to medium enterprises, or are street vendors, cross border traders and farmers. Formally employed urban gardeners were 26.3%, and were mainly civil servants, NGO officials, and those who were employed in the private sector. There were 8.1% urban farmers who were employed on a contract-part time basis. The findings of this study are similar to other African studies where UA is dominated by the unemployed (e.g. Cape Town

and Chinoyi) (Breitenberg and Schuurman, 2013; Pedzisai et al, 2014). However, other studies also observed the participation of the middle class such as lower end and mid-level government officials in Dar es Salaam (Jacobi et al. 2000; Mrema and Chitiyo, 2011).

Figure 5.1: Employment status of urban gardeners in Bulawayo



Source: Author's compilation based on field survey

5.1.6 Income

The highest response for the monthly income of the urban gardeners was 38.4% for the lowest income range (below US$100). Approximately 25.3% of the respondents earned more than US$300 a month while 24.2% earned between US$100 to US$200. The US$201 to US$300 income range had the least number of respondents (12.1%). The average wage in Zimbabwe is US$253 (Hobbes, 2014). The total consumption poverty lines per person in Zimbabwe are US$96.65 and $484.20 for an average family of five (ZimStats, 2015). Urban agriculture is dominated by low income earners, especially in developing countries (Smit et al, 1996; Mougeot et al, 1998; May and Rogerson, 1995; Salau and Attah, 2012). Lack of employment is associated with low incomes, so it is not surprising that a majority of urban gardeners in Bulawayo have low incomes as most of them were not employed considering that Bulawayo has the highest

unemployment rate in Zimbabwe of 33.8 % (ZimStats, 2015). Low incomes reduce the ability of urban farmers to expand their activities or to procure capital intensive technologies.

Table 5.4: Income distribution of respondents

Income range	Frequency	Percentage
Below US $100	38	38.4
Between US$100 and US$200	24	24.2
Between US$201 and US$300	12	12.1
Above US$300	25	25.3
Total	99	100

Source: Author's compilation based on field survey

5.1.7 Household density

The majority of the study participants 35.4% had 3 to 4 people in their households. This was followed by 33.3% respondents with 5 to 6 people in their households. Approximately 16.2% had 1 to 2 people in their households whilst 15.2% of the households had more than 6 people. One would expect that the need to provide food for a big family would be a key determinant of household participation in urban agriculture, but in this study most of the respondents had relatively small families.

Table 5.5: Household density of the respondents

Household density	Frequency	Percentage
1-2 people	16	16.2
3-4 people	35	35.4
5-6 people	33	33.3
More than 6 people	15	15.1
Total	99	100

Source: Author's compilation based on field survey

5.1.8 Migration History

Most of the home gardeners (44.4%) were born in Bulawayo. Those who had migrated from a rural area were 41.4% while 14.14% had migrated from another town. The findings of this study indicate that home gardeners are not recent rural migrants similar to the findings of Maxwell (1995) in Kampala, Uganda, and Egziabher (1994) in Addis Ababa, Ethiopia. These home gardeners had dwelt long enough in Bulawayo to accumulate social capital, natural capital (e.g. land) and physical capital (e.g. equipment) required in order for them to engage in farming activities (Egziabher, 1994; Fouken, 2000).

5.1.9 Accommodation Status

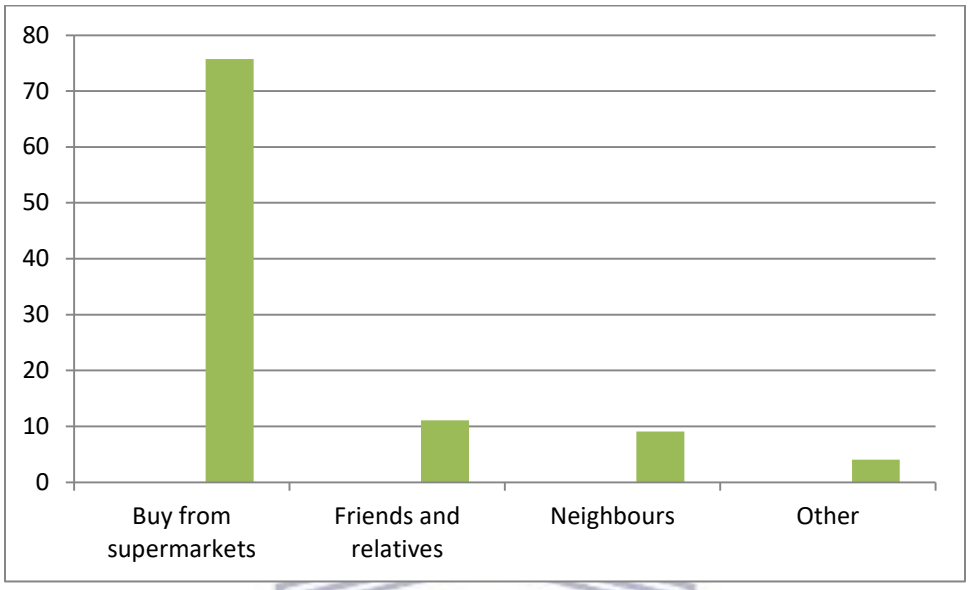
Almost 65% of respondents owned their houses, 15% rented their accommodation, and 20% lived in accommodation owned by a relative where they are staying for free or assisting in the payment of monthly rentals. The ownership of property influences the ability to develop and expand agricultural activities. The ownership of physical capital (a house) is accompanied by the ability for using natural capital (land) which explains why most home gardening takes place in privately owned houses in Cowdray Park. The findings of this study indicate that home gardening is not practiced by the poorest of the poor who might have challenges in buying houses (Tevera (1999) cited in Crush et al, 2011; Reuther and Dewar, 2005). While renters might have access to backyard gardens they may not have the liberty to expand and develop their home gardens, for example, by constructing temporary shelters for poultry production.

5.2 Sources of food for urban households

The majority of the study respondents practiced a form of urban agriculture (98%). Only 2% of respondents cited constraints of time and space as limiting them to engage in home-based agricultural production. Urban people generally access food through purchases (mainly sourced from rural areas or imported into the country), formal social safety nets, and through social networks (FAO, 2008; Battersby, 2011). There are, however, urban dwellers that source their food from their own practices of urban or peri-urban agriculture although in some instances they are very few. A majority of respondents (75.8%) sourced their food from supermarkets. The findings of this study confirm that urban food security hinges on the accessibility of financial

resources as most of the respondents depend on supermarkets and other shops for food purchases (Oxfam, 2014; Frayne et al, 2009; Crush et al, 2011a).

Figure 5.2: Sources of food for urban farmers



Source: Author's compilation based on field survey

The dependence of urban dwellers on supermarkets is a growing trend in most Southern African cities, including Bulawayo (Crush and Frayne, 2011; Battersby, 2011; Peyton et al, 2015). About 11.1% of study respondents sourced their food from friends and relatives whilst 9.9% was from neighbors. There were only 4% of respondents who mostly sourced their food from other sources. When they were further probed the researcher learnt that they grew most of the food for their household consumption not only in their urban plots but they also had land in their rural home. Approximately 40 % of the study participants had access to plots in rural areas where they grew part of their staple crop. Chipo Mutema, (female, nurse) was one of the respondents who grew maize seasonally in her rural plot;

> I mainly source my household's staple food from my rural plot. If we have a bumper harvest we never buy mealie-meal from the supermarkets. I also get my milk and eggs sometimes from my rural home. My home garden is only for vegetables not maize, mainly due to the limited space available. (July, 2017)

The dependence of some urban households on their rural plots indicates that there is an important rural-urban food security connection. However, other urban farmers did not have access to rural

plots but those who had off-plot or open space gardens could mainly source their food from their own gardens. One of the urban farmers, Unity Moyo (female, self-employed) for example, responded in the following manner;

> I grow most of the food that my household consumes. I managed to harvest 7 sacks of maize from my off-plot urban garden and this will sustain my household of three for the coming year. I always dry vegetables and keep broiler chickens for my children to eat. Growing my own food ensures that we can never go to bed hungry. (July 2017)

It is clear that home-based urban agriculture is not the key source of food for most of the respondents but rather it plays a complementary role. Galhena et al (2013) argue that home gardens are not generally reputed as staple-crop producers in urban areas but rather they are instrumental in supplementing staple based diets with a significant portion of proteins, vitamins, and minerals, leading to an enriched and balanced diets. Home gardens are generally small in size, approximately 10 square metres (Breitenberg and Schuurman, 2013; Olivier, 2015). The limited land available in backyard gardens only permits home gardeners to cultivate vegetables instead of staple crops and this explains why a majority of the home gardeners purchase a big portion of their food.

5.3 Food security coping strategies

Urban households use various strategies to respond to the risks of food insecurity that they encounter in their daily lives. Food insecurity is essentially a managed process meaning that people actively respond to food shortages at household levels using different methods known as food security coping strategies (Coates et al, 2007). Growing food for household consumption was a key food security coping strategy for 49.5% of the respondents. The study participants who grew a part of their food as a coping strategy pointed out that it reduced their vulnerability to market price fluctuations and inflation. Urban populations in Zimbabwe in years 2003 and 2008 as an example experienced major food shortages whereby there was no food in the shelves of supermarkets and shops. Urban gardeners could depend on their vegetables such as potatoes as a main starch and make vegetable salads. One of the participants, Primrose (female, student) responded that "…we can never go to bed hungry even when we could not possibly buy mealie-meal to prepare sadza (staple food made from maize) because we can make potato wedges and a green salad."

The practice of urban agriculture has been pointed out as one of the most widely used strategies by urban dwellers to reduce their vulnerability to food insecurity (Chagomoka et al, 2016). Home-food production in this study was found to be a key strategy in reducing household vulnerability to insufficient, unpredictable and inconsistent access to food and a lack of purchasing power (FAO, 2008). The growing of 'own food' (home grown) coping strategy was largely dominated by women and youth (18-24 years). Women in Ghana, Thailand, Bolivia, Ecuador, Philippines and Ecuador were reported to take a lead in adopting various coping strategies to circumvent food insecurity (Chagomoka et al, 2016). The dominance of women in food growing strategies has also been reported in Ghana, where they dominate in urban farming (Horvoka et al, 2009).

Almost 18.2% of respondents skipped meals as a coping strategy. Reducing food portions and eating less preferred food were both selected as food security coping strategies by 12.1% of the urban gardeners. These severe food security coping strategies were also dominated by women although they were slightly older (32 -38 years). The households which reduced food portions and skipped meals as coping techniques were largely from moderately food insecure to food insecure households. Households tend to resort to food compromising or severe coping strategies which represent greater food insecurity, affecting food quality and quantity (Coates et al, 2007). There were 5% of urban farmers who had other coping strategies such as migration and joining Rotating Saving Clubs for groceries. Only 3% of the study participants borrowed food from friends and relatives as a coping strategy.

The findings of this study indicate that urban households in Bulawayo might be prone to food insecurity when one takes into consideration the percentage of people who use severe coping strategies (skipping meals, reducing food portions and borrowing food). These make up the population of the sample who were found to be moderately food secure or they were food insecure. These food security coping strategies further indicate that household food availability, accessibility, stability and food utilization are compromised. Findings from other countries indicate that the dominating food security coping strategies besides the practice of urban agriculture are consuming less preferred food (Nigeria), reducing food portions (Nairobi, Kenya) and the sale of assets (Rwanda) (Kyaw, 2009; Amenda et al, 2014; Chagomoka et al, 2016). It emerges from the findings of this study that the food security coping strategies adopted by

households are determined by their vulnerability to food insecurity. Households which are at risk of food insecurity adopt more severe coping strategies such as skipping meals.

Table 5.6: Food Security coping strategies of urban households

Food security coping strategies	Frequency	Percentage
Skip meals	18	18.2
Grow own food	49	49.5
Reduce food portions	12	12.3
Borrow food	3	3.0
Eat less preferred food	12	12.1
Other	5	5.0
Total	99	100

Source: Author's compilation based on field survey

5.4 The practice of Home-based urban agriculture

5.4.1 Types of home-based agricultural production activities

The most commonly practiced type of home-based agricultural production was vegetable growing which comprised approximately 60% of respondents. The vegetables grown included kale, spinach, collard greens, potatoes, tomatoes and onions. Almost 17% of the urban gardeners practiced a combination of agricultural types (vegetable production, poultry production, crop production) while 15% focused solely on poultry production (broiler chickens, traditional chickens and layer chickens). The focus on poultry production proved to be more profitable as compared to other forms of home-based urban agriculture. The practice of poultry production has been intensifying as households seek to adapt to the unstable economic environment, which is threatening the sustainability of urban livelihoods. Smart et al (2015) contend that in cases of extreme economic hardship and crisis, urban agriculture plays an important role in promoting household adaptation and coping. The production of crops (maize, sugar cane and ground nuts) was practiced by 5%. Only 1% of the respondents had small animals such as rabbits and guinea pigs.

5.4.2 Household measures to accommodate home–based urban agriculture

The need for innovation to cope with the scarcity of space and resources in urban areas is high (Prain and De Zeeuw in Optiz et al, 2015). The allocation of residential stands in high density suburbs in Zimbabwe overlooks the practice of home gardening. Urban households come up with various methods to accommodate agricultural activities. There were 42.2% who accommodated home-based urban agriculture by using the front spaces of their houses. Backyard spaces were used by 33.3% of study participants. The use of backyards or front yards was determined by the availability of space in a household, depending on the number of rooms constructed. Houses with few rooms (2 to 4 rooms) as shown in Fig 5.3 had more space available for a backyard garden and as a result the house owner could grow maize, sweet potatoes, kale and had some fruit trees as compared to houses with 5 or more rooms.

Source: Author (July, 2017)

Figure 5.3: Front yard gardens of different sizes

Just over 13% of respondents used extra rooms to accommodate agricultural production (e.g. producing broiler chickens). The rooms used to accommodate broiler production were located inside houses in an effort to overcome space constraints for small backyards and the financial costs of constructing a temporary shelter. One interview participant, Unity Moyo, (female, self-employed) who had converted a room in her house into a fowl run, responded that:

> I use one of the rooms in my 5 roomed house as a fowl run due to the limited space available here. Using this room to keep broilers is more profitable than having people to rent the room or having my children use it as a bedroom.

Urban agriculture can be accommodated in vacant buildings or rooms which are not typically designed for agricultural production (Optiz et al, 2015). However, this can pose risks on the health of the farmers caused by avian flu or air pollution which the farmers said they averted through cleaning the rooms and carefully disposing the manure (usually in their off-plot or home gardens). There were 6% of respondents who built temporal shelters to accommodate their poultry production as shown in figure 5.4. These temporary shelters are usually not part of city council approved structures but people just construct them anyway. Only 3% of respondents used sacks for growing potatoes. Backyards and front yards were the principal avenues to accommodate urban agriculture in Bulawayo, which are similar to findings in South Africa, Canada, France and other Zimbabwean cities (Breitenberg and Schuurman, 2013; Korthwright and Wakefield, 2011; Optiz et al, 2015; Mrema and Chitiyo, 2011). The measures done to accommodate home gardening are an indicator of the limited space available for agricultural purposes in urban areas.

Source: Author (July, 2017)

Figure 5.4: Temporary structure built for broiler production

5.4.3 Motivations for engaging in Urban Agriculture

The main motivation for practicing home-based agriculture in Bulawayo is to ensure food security (see figure 5.5). These households sought to reduce their vulnerability to shocks and stresses which could affect their food security. The research shows that 64% of respondents were motivated to practice urban agriculture to provide adequate food for their households while 24% of respondents were motivated by the need to provide both income and food security for their households. Ten percent of respondents were solely motivated to engage in urban agriculture for income purposes whilst only 2 percent of respondents did not have any motivation because they were not practicing home-based agriculture. The motivations for engaging in urban agriculture in this study indicate that urban households mainly seek to increase food availability and access. This ensures that households become more food secure in the post-harvest seasons as stated in the food security definition that all people, at all times should have "… physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (FAO, 1996). Food stability is also ensured when households no longer need to buy from supermarkets. One of the FGD participants said that she no longer needed to "buy mealie-meal from supermarkets for about three months after

the post-harvest season" (FGD participant 2, July 2017). The diversification of livelihoods through the practice of home-based urban agriculture helps households to generate more income and therefore reduce their vulnerability to economic shocks and stresses.

The interviews and FGDs with urban farmers further revealed that there were also other motivations for practicing urban agriculture. These included health reasons, a sense of fulfillment, accessibility and the increased availability of fresh vegetables which appeal to their taste. For example, Monalissa Nyoni, a primary school teacher provides multiple motivations for her engagement in home-gardening:

> I am practicing urban agriculture mainly for maintaining my household's food security, health and wellness. I realised that I cannot trust the chickens produced by other people, I hear some people feed them with pig feed and a lot of unhealthy substances so I decided to keep my own birds for household consumption and for sale. (August 2017)

The need for ensuring household health and well-being was further raised by the FGD participants. FGD Respondent 3 raised concerns on the health risks of consuming vegetables produced using contaminated water and fertilisers:

> The vegetables that you plant for yourself you monitor and you know what you have put in order for them to grow. These other vegetables that we buy are watered using sewage water and they have fertilisers. You can end up getting sick from the sewage effluent watered vegetables. (FGD, July 2017)

The need to maintain household health and well-being is not only a concern for poultry producers but vegetable and crop producers also cited concerns on the consumption of genetically modified products or the use of waste water. Similar concerns of health and wellness were also found particularly in developed countries such as Canada, France, USA, and Britain (Korthwright and Wakefield, 2011; Pourias et al 2016; Taylor and Lovell, 2015). Home-based gardening enables households to have assurance in the products they consume as they choose for themselves the fertilisers and pesticides that they use. This is important for the utilization dimension of food security as they are able to choose to cultivate more nutritious and safe food.

Urban farmers in Bulawayo are also motivated by financial reasons to engage in urban agriculture. One of the study respondents who was a low income earner (less than US$100/month), Melody Ncube, stated "…I realised that I do not have to be buying vegetables

when I can easily grow them for myself." She was motivated by her financial constraints to save money that she could have used to purchase vegetables for other purposes. The saving dimension was further brought into light by a FGD respondent:

> You also save money through growing for yourself. Your children can actually get pocket money and you can also buy other nutritious food using that money you could have used to procure vegetables if you were not growing them for yourself. (FGD respondent 5, July 2017)

Households in Bulawayo did not only manage to save money but they were also able to buy more nutritious food. Home-based urban agriculture also assists households to buy other household goods besides food such as school supplies and paying monthly rentals. Primrose Dube, a student who made profits of approximately US$20 from her home garden used the profits to "…buy school stationery such as pens and exercise books." Other respondents such as Unity Moyo, used their profits "…to buy electricity tokens, pay water bills, pay school fees and buy school supplies." In Nicaragua, Boone and Taylor (2016) found that 90% of their respondents perceived the practice of home-gardening as contributing to diversified and healthy diets while offering the opportunity to save money by not purchasing food at local supermarkets. Similar findings have also been found in Cape Town, South Africa where home-gardeners expressed concerns on the high costs of fresh vegetables and fruits from supermarkets hence they preferred to grow some vegetables for themselves (Breitenberg and Schuurman, 2013).

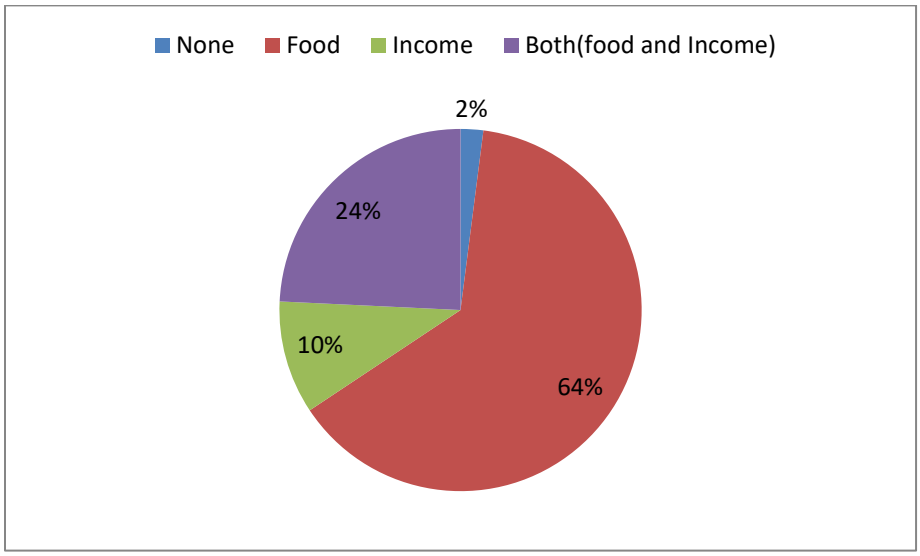
Urban farmers also cited taste preferences and accessibility to fresh vegetables as motivating factors behind their practice of home gardening. South African home-gardeners perceived vegetables from large grocery shops to be of a less desirable quality and taste (Breitenberg and Schuurman, 2013). Urban farmers in Paris and Montreal also cited issues of taste preferences as important (Pourias et al, 2016). In Bulawayo, home-produced vegetables particularly were perceived to taste nicer. A study participant, Melody Ncube indicated that the vegetables she grew "…taste nicer; those who grow vegetables for resale put fertilizers which result in a slightly bitter taste which I do not like." One of the FGD respondents also raised the concern on taste preferences by stating that:

> You can actually taste the difference from the vegetables that you grow in your own yard. These purchased vegetables from street vendors you don't even know where they keep them which exposes one to health hazards really. (FGD respondent 6, July 2017)

Studies from both developed and developing countries indicate that the need to promote household food security is a key motivation for practicing any form of urban agriculture (Mrema and Chitiyo, 2011; Ruggeri et al, 2015; Poulsen et al, 2015; Da Silva et al, 2016). This study found that food security was a key motivation for 64% of households; there were a number of households who sold their extra produce (24%) whilst some were agricultural entrepreneurs (10%). This study also found that urban gardeners in Bulawayo have concerns similar to farmers in the North when it came to ensuring health and wellness, taste preferences, enhancing feelings of self-worth although these were secondary motivations (Battersby and Marshak, 2013; Ruggeri et al, 2016). It emerged that the practice of home-based agriculture is not only driven by the necessity of maintaining household food security but households also engage in home-based agriculture to diversify their livelihoods as urban people do not commonly depend only on one source of income.

The research showed that 9% of the respondents sold all of their produce, 22% sold a quarter, and 19% sold half of their produce. The other 50% of the respondents sold their produce to supplement household food security rather than generating income to use for other purposes. Approximately 17% of the respondents used the income generated from the sale of agricultural produce to buy more food. Urban households who generate income through the practice of urban agriculture are able to procure more nutritious food that is better utilised for healthy bodies. Purchasing more food using urban agriculture generated income also increases the availability of food that meets their household food preferences. The findings from this study show that 10% of the households utilised the income to pay school fees whilst 9% used their income to pay utility bills. In addition, 5% of the respondents used the income to purchase assets such as refrigerators, solar panels, and television sets. A further 7% of the respondents specified that they used their income from urban agriculture to meet all or some of the responses mentioned above.

Figure 5.5: Motivations for the practice of home-based agriculture



Source: Author's compilation based on field survey

The income generated from selling produce played an important role in paying for household expenditure. Studies elsewhere, however, dispute the expenditure contribution of UA, primarily because of the value of urban land (Ellis and Sumberg in Olivier, 2015). In South Africa, the income of cultivators was directly related to experience with some earning just over ZAR 1.00 per square metre per month, while experienced cultivators could earn almost four times that (Reuther and Dewar, 2005). The monthly income gained from UA in other African cities such as Nairobi, Lagos and Dar es Salaam ranged from US$10-US$163, US$53-US$120 and US$60, respectively (Arku et al, 2012). In this study, the average income gained ranged from US$200 to US$300 per month for poultry farmers and about US$20 to US$50 per month for those who sold vegetables. While the income gained from the sale of surplus vegetables may seem little, it however, makes a significant contribution to urban livelihoods, especially if it is coupled with other livelihood strategies. Considering that the total consumption poverty lines per person in Zimbabwe are US$96.65 for an individual and $484.20 for a household of five people, the income gained from the sale of produce supplements the incomes gained from other livelihood strategies.

The interviews with individual urban farmers revealed that those who engaged in both vegetable and poultry production bought more assets and extended their houses especially for those who had other sources of income of more than US$300 a month. For example, Nokuthala Ndlovu, a High School teacher, managed to buy a car and pay university tuition for her daughter solely

from the practice of home-based poultry production. Nokuthula stated that "My friends and I did a Rotating Saving Club from our broiler chicken production profits. We managed to buy cars for ourselves within a period of a year and I even paid university tuition fees for my daughter" (Interviewee 6, July 2017). Nokuthula made profits of approximately US$200 after every 6 weeks. The profit was not used to cover for household expenses but rather she paid it to the Rotating Saving Club hence she was able to buy a car (costing about $1 500, second hand) after a period of a year. It is clear that those who practiced home-based agriculture as entrepreneurs (for the purposes of sale rather than household consumption) were able to generate more income.

Table 5.7: Uses of profits gained from the sale of agricultural produce

Use of money	Frequency	Percentage
Did not sell	51	52.5
Buy food	17	17.2
Pay household utility bills	9	9.0
Pay school fees	10	10.1
Buy household assets	5	5.0
Other	7	7.1
Total	99	100

Source: Author's compilation from field survey

The findings of this study reveal that engaging in home-based urban agriculture increases the budgets of participating households leaving them with extra income to meet other requirements such as giving school children pocket money. One of the participants, Mrs Sibongile Khumalo acknowledged that she did not gain a significant amount of money from the sale of her vegetables but at least she was able to give her children pocket money:

> If you come with a US$1or even 50 cents I can actually sell the vegetables to you and then with that money I can now buy bread, milk and give my school going children pocket money. (August, 2017)

Urban agriculture is therefore instrumental in diversifying livelihoods through improving family budgets (Pedzisai et al, 2014). Home-based agricultural production is one of the many strategies that they practice in order to reduce their vulnerability to shocks. This means that if one livelihood strategy is affected by shocks, households can still earn a living without utilising severe coping strategies. The importance of livelihood diversification was well captured in the response made by Patricia Ndlovu, a self-employed woman:

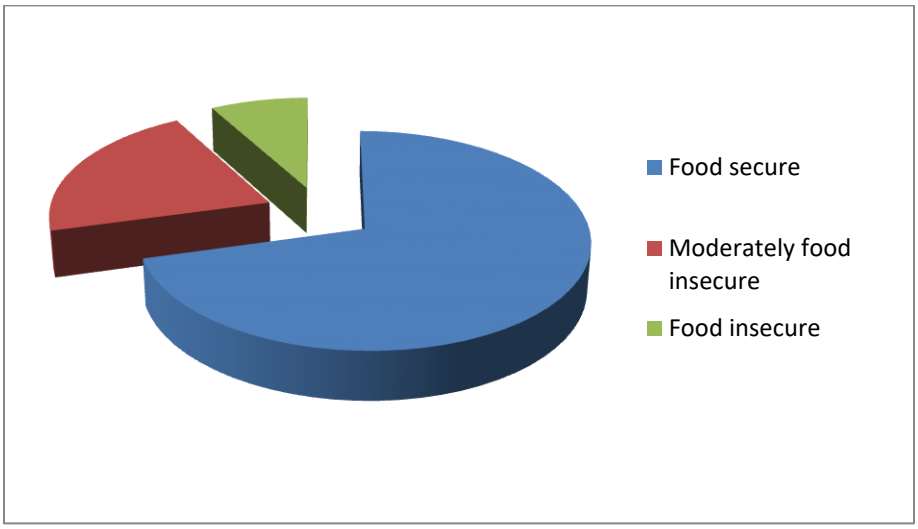
> I cannot put all my eggs in one basket especially in an unpredictable economic environment such as ours. Depending on sewing, cross-border trading and urban farming means that I am insured if one of them fails, certainly they cannot all fail at the same time. (August 2017)

The unpredictability of the economic situation in Zimbabwe encourages urban dwellers to explore avenues which can improve their well-being and reduce their vulnerability to poverty. The practice of home-based agriculture enabled some households to increase their incomes and save money to engage in other economic activities or buy more nutritious food as confirmed in previous studies (Amar-Klemesu, 2000; Kutiwa et al, 2010; Pedzisai et al, 2014).

5.5 The nexus between HBA and household food security

The Household Food Security Access Scale (HFIAS) was used to measure the level of household food security of urban farmers. The HFIAS measures the access component of household food insecurity based on the idea that food insecurity causes predictable measurable household responses (USAID, 2018). The HFIAS scale allocates categories which indicate household absolute access to food and appropriate food choices (Battersby, 2011). The HFIAS questions were slightly modified for the purposes of this study and they were centered on food availability and accessibility. Approximately 71% of the households were food secure, 21% were moderately food insecure while 8% were food insecure as shown in figure 5.6. The explanation behind a large percentage of food secure households could be that the study was conducted in the post-harvest season. Kyaw (2009) argues that food insecurity dominantly prevails during post-harvest transitory periods. This applies in the Bulawayo case, where the planting of the staple crop is seasonal.

Figure 5.6: Household Food Insecurity Access Score



Source: Author's compilation based on field survey

There was a consensus from the study participants that urban agriculture contributes significantly to household food security. The practice of home-based urban agriculture was found to address the availability, access, stability and utilization dimensions of food security. The contribution of urban agriculture to household food security was linked to its ability to increase the availability and accessibility of safe and nutritious food. The increase in incomes and saving money by some households catered for the utilization dimension of food security in that home gardeners could access adequate diets required for nutritional well-being. Food stability was ensured through the increased availability of food in home gardens which reduced the risks of households to losing food as a result of sudden shocks. The Residential Association representative noted that, "You can never go to bed without eating if you practice urban agriculture, you can save money that you would have used to buy vegetables and buy something else to improve your diet." This indicates that home-gardening plays a role in generating and saving money which can be used for household expenses. One of the interview respondents observed that home gardening helped her family "…to eat safe, cheap and nutrition packed food which was not possible before." (Monalissa Nyoni, July 2017). Victor Ncube, a male retiree, stated that "I buy groceries from the profits that I make. We always have chicken to eat right in our backyard so it means we have more proteins in our diet." The practice of home-based agricultural production enables households to consume more nutritious and diversified diets.

The practice of urban agriculture does not only promote food and nutrition security but also livelihood diversification. The NGO official from ZDDT stated that:

> Urban agriculture is a livelihood option for many people. Some people sell their produce and buy food. There are some who harvest from their gardens and eat hence issues of food availability and accessibility are promoted. When it comes to food utilisation urban agriculture improves the dietary diversity of households especially when it comes to micro-nutrients and proteins (e.g. for the poultry farmers which is a viable activity). (August 2017)

The link between urban agriculture and household food security is centred on its ability to increase food accessibility and availability. The respondents reported that they had increased access to safe, nutritious food right in their backyards which has been reported in other urban agriculture studies conducted in Bulawayo and Gweru (Zezza and Tasciotti, 2010; Jongwe, 2014; Sebata et al, 2014). UA promotes food security in Bulawayo directly through the eating of produce for example when home-gardeners no longer need to buy vegetables, poultry and mealie-meal. The indirect contribution of UA to food security is achieved when they save the money that they would have used to buy produce and buy other food items. Households can save the money that they could have used for purchasing food for other economic activities or buying more nutritious food thus promoting the intake of balanced diets (FAO, 2008; Amar-Klemesu, 2000; Kutiwa et al, 2010; Pedzisai et al, 2014). It emerges from the study that urban agriculture acts as a key food security coping strategy which increases household incomes, promotes the accessibility and availability of nutritious food.

5.5.1 Socio-economic determinants of household food security

The researcher conducted a regression analysis to find out whether socio-economic variables were related to household food security (see Table 5:8). The dependent variable was the Household Food Insecurity Access Scale (HFIAS) whilst the independent variables were education, employment status, monthly income and household density. The model has an F statistic of 2.40, an r-square of 0.092 and an adjusted r-square of 0.0541. This indicates that the independent variables in the model explain the dependent variable by 5.41 percent holding all other variables constant. The first independent variable which is education has a negative coefficient of -.013302 indicating that for every unit decrease in education there is a decrease of -

.013302 on household food security. The education coefficient was, however, not statistically significant at a 95 percent confidence interval as it has a p-value of 0.786. Monthly income also has a negative coefficient of -.0811789 and a p-value of 0.194 at a 95 percent confidence interval. The model results for education and monthly income are expected as they can determine one's access to financial resources for purchasing food.

Table 5.8: Socio-economic determinants of Household Food

Source	SS	df	MS	Number of obs =	99
				F(4, 94) =	2.40
Model	3.63113067	4	.907782669	Prob > F =	0.0554
Residual	35.5405865	94	.378091346	R-squared =	0.0927
				Adj R-squared =	0.0541
Total	39.1717172	98	.3997114	Root MSE =	.61489

HFIAS	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Educ	-.013302	.0489614	-0.27	0.786	-.110516	.083912
EmpSt	.0428749	.0743568	0.58	0.566	-.1047623	.190512
MntInc	-.0811789	.06202	-1.31	0.194	-.204321	.0419633
Noinhhd	.2028434	.0705775	2.87	0.005	.06271	.3429767
_cons	1.012005	.21567	4.69	0.000	.583787	1.440223

Source: Author's compilation based on field survey

Employment status and household density have positive coefficients of .0428749 and .2028434, respectively. The p-value for household density at a 95 percent confidence interval is at 0.005. The researcher expected that for every increase in the number of people in a household there will be a decrease in household food security. The results of the model are not statistically significant which indicates that socio-economic variables are not the only determinants of household food security in Bulawayo. The cross tabulation of the employment status as shown in Table 5.9 reveals that a majority of the non-employed were food secure when one would expect that unemployment would be a lead contributor to household food insecurity. These results are an indicator of the diversity of urban livelihoods, people do not depend solely on employment for food but they also grow, borrow from friends, and share food with their relatives. This is particularly true for the majority of the study participants who were still youth and were most likely to be depending on the incomes of their families and relatives.

Table 5.9: Cross tabulation of employment status and HFIAS

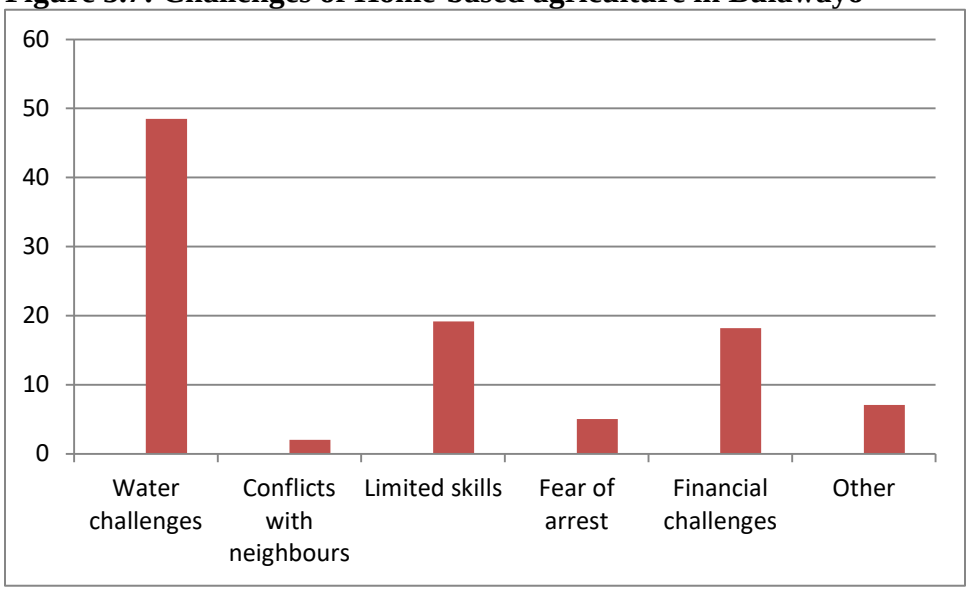
Employment status	Food secure	Moderately Food insecure	Food insecure	Total
Not employed	23	8	3	34
Self-employed	24	5	2	31
Formally Employed	18	6	2	26
Contract Part-time	5	2	1	8
Total	70	21	8	99

Source: Author's compilation from field survey

5.6 Challenges of Home-based urban agriculture

Lack of water is the most common challenge associated with the practice of home-based urban agriculture in Bulawayo. Forty eight percent of the respondents viewed water to be a serious challenge which hampers their agricultural activities. Similar water challenges were found in Harare, Zimbabwe, caused by the lack of resources required for the purification process (Kutiwa et al, 2011). Bulawayo is located in a semi-arid region of Zimbabwe which presents challenges to city authorities. Water rationing affects the implementation of home-based agricultural production activities. Limited skills to practice urban agriculture was selected as a challenge by 19% of the urban gardeners followed by 18% who experienced financial challenges. Seven percent of respondents experienced other challenges which were not part of those listed in the questionnaire. The challenges they experienced included limited space, time and lack of house ownership which limited the expansion of agricultural activities. Five percent of respondents feared arrest due to the illegal rearing of broiler chicken's which exceed the allowed limits. Furthermore, 2% of respondents had conflicts with their neighbors as a result of their agricultural activities.

Figure 5.7: Challenges of Home-based agriculture in Bulawayo



Source: Author's compilation based on field survey

The additional challenges identified in interviews and the FGD included theft, lack of access to markets and the eating of produce by donkeys and cattle from nearby plots. In their study in Nicaragua, Boone and Taylor (2016) found that the challenges experienced by home-gardeners included the lack of necessary equipment, expensive seeds, animals eating plants and the unreliability of water. The challenges faced by home-gardeners are similar to those experienced by community and allotment gardeners. In their study on UA in Malawi, Mkwambisi et al (2011) found that urban farmers faced challenges which comprised the lack of finance, access to seeds and planting materials, weak extension and advisory services, access to labour, and access to markets which were also identified in previous studies in Zimbabwe (Moyo, 2014; Kutiwa et al, 2014, Sebata et al, 2014). Lack of finance affects the home-gardeners access to inputs and it hampers the expansion of their agricultural activities to more profitable ventures.

The lack of agricultural extension services targeting home-gardeners in Bulawayo affects the quantity and quality of their produce as some lack the necessary skills. The challenges experienced by home-gardeners in Bulawayo, however, differed from those in developed countries such as Canada who feared pollution from dust, vehicle and train emissions (Korthwright and Wakefield, 2011). The efforts done by home-gardeners to address the challenges they experienced in Bulawayo included limiting garden space to reduce the amount of land watered, listening to television programmes such as *Murimi wanhasi* (Today's Farmer), researching on the internet for knowledge on gardening, borrowing money from friends, relatives

and microfinancing. The planting of African kale (figure 5.8) was a strategy used by urban gardeners to overcome water challenges as this leafy vegetable is drought resistant and can be watered once a week during dry seasons. These efforts ameliorate some of the challenges experienced by home gardeners hence enabling them to continue with their projects.

Source: Author (July, 2017)

Figure 5.8: African kale planted in a backyard garden

5.7 Urban agriculture and Sustainable Livelihoods

5.7.1 Vulnerability Context

The practice of urban agriculture was viewed as instrumental in reducing the vulnerability of urban households to food insecurity and the unpredictable economic environment in Bulawayo. The need for reducing household vulnerability was well captured in some of the answers to the interview question pertaining to the motivation behind the practice of urban agriculture. One respondent, who is a primary school teacher by profession, responded that:

> I am an urban farmer because I desire to improve the well-being of my family when it comes to food security and income. I also see it important in enabling me to supplement my salary especially in these hard economic times we have been experiencing for quite some time. (Sinikiwe Lunga, July 2017)

The practice of home-gardening for civil servants like Sinikiwe Lunga acts as a livelihood diversification strategy. Urban households rely on various sources of income in order to reduce their vulnerability to economic stresses and shocks. The fact that 49% of study respondents selected growing their own food as a food security coping strategy is an indicator that urban agriculture plays a pivotal role in reducing the vulnerability of households. Jongwe's (2014) study in Gweru, Zimbabwe similarly found that households engaged in urban agriculture to reduce their vulnerability to the hyperinflationary period in 2008. The instability of the economy of Zimbabwe is a threat to sustainable urban livelihoods leading some individuals to engage in urban agriculture to reduce their vulnerability to economic stresses and shocks. Household vulnerability is also reduced through strengthening asset portfolios. Rogerson (1998:178) argues that "the asset bases of the poor and the management of their complex asset portfolios counter vulnerability to poverty. Urban agriculture helps cultivators to gain financial capital as an example which is one of the most versatile livelihood assets. The financial capital gained can be used to invest on the increase of other livelihood assets such as human capital (getting educated) and physical capital (buying a house) which then reduces households to poverty. The role played by UA in strengthening the livelihood bases of cultivators is expanded on in the following section.

5.7.2 Livelihood Assets

There is a strong relationship between the practice of urban agriculture and the availability of the livelihood assets at one's disposal. The practice of urban agriculture can also improve the livelihood asset base of participating households. The ability for one to start farming is directly related to the ability to have access to natural capital (e.g. land) which is also affected by the access to physical capital (e.g. a house, water connections) which is crucial for home-based agriculture. Sixty five percent of study respondents owned houses while 15 percent rented houses. One of the respondents viewed the lack of home ownership as a key challenge to her practice of home-based urban agriculture. She stated that:

> I cannot expand my agricultural activities by constructing a temporary shelter to practice poultry or mushroom production because that would create problems with the landlord. I can only limit myself to small scale vegetable gardening. (Olivia Ncube, housewife, July 2017)

Lack of house ownership becomes a constraining factor for some renters like Olivia who long to expand their agricultural ventures to more lucrative sectors. This limits possible livelihood diversification and access to additional income, household food security and well-being hence house ownership may be crucial for successful home gardening. The scarcity of water as a result of water rationing in the city of Bulawayo was another component of physical capital which was a stumbling block to the practice of home-based agriculture.

Social capital proved to be very important for successful urban gardening. Social capital refers to the "[f]eatures of social organization, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions" (Putnam, 1993:167). Social capital can be created by the practice of urban agriculture and it is also a prerequisite for the success of UA (Olivier, 2015). A study in Kenyan informal settlements found that households with existing networks increased their social capital through interactions between farmers and other community members (Gallaher et al, 2013). In Cape Town, South Africa urban farmers exhibited trust and reciprocity within cultivation groups (Jacobs, 2009). The findings of this study indicate that urban farmer's networks and relationships helped them to gain information on what to plant, source inputs and discuss how to deal with pests and diseases. There was a trend of sourcing inputs from neighbors revealed in interviews and the FGDs conducted with the urban gardeners. When the FGD participants were asked on how they source inputs such as seedlings, one responded in the following manner:

> We buy some of the seedlings but mostly we just ask from our neighbors. Ash acts as a good pesticide, so we do not buy any pesticides. You must really have good relationships with your neighbors if you are to be a successful farmer. (FGD respondent 4, July 2017)

It appears that one should have good social capital in order to be a good urban farmer. There is a need for the existence of social capital before the practice of UA however; social capital is also strengthened by UA (Nel et al., 2001). Social capital in Bulawayo was strengthened through the exchange of vegetables. One urban gardener, Primrose Dube, a student, responded that "…what

we also do is to exchange vegetables with our neighbors especially mustard greens and then they can give us what we do not have for example potatoes." Similar findings were reported in Toronto, Canada (Korthwright and Wakefield, 2011), the USA (Taylor and Lovell, 2015), and Kenya (Gallaher et al. 2013:396). Urban farmers had positive interactions with their neighbors often emanating from their home gardening activities. The importance of social capital also became evident when the respondents were asked about people who helped them out in their agricultural activities. The majority of study participants (65%) were assisted by their family members. Forty-three percent of the respondents had access to the information required for the implementation of their agricultural projects from family members and friends.

The ability of an urban farmer to get inputs and knowledge can be affected by the availability of financial capital. The majority of respondents did not have any form of external support; they relied on their own income to finance their gardening projects which is in line with the findings of Hovorka et al (2009) in Ghana, where urban farmers relied on self-financing. Urban farmers have limited access to credit schemes due to limited spaces of cultivation (Salau and Attah, 2012). Sixty nine percent of urban farmers relied on their own source of income whilst 24% relied on relatives and friends in order to finance their agricultural activities. Financial challenges were viewed as an obstacle to home-based agriculture by 18% of the study population. The financial capital of some households was boosted by the practice of urban agriculture. About 34% of urban farmers gained income from the sale of their produce. Urban agriculture has the potential to realise incomes comparable to "mid-level civil servants" (De Zeeuw et al, 2007:11). The average income gained ranged from US$200 to US$300 for poultry farmers and about US$20 to US$50 for those who sold vegetables which is substantial especially for households with diverse livelihood strategies. Urban agriculture can therefore play an important role in enhancing the financial capital base of households.

Limited skills were the second most important challenge faced by urban gardeners in Bulawayo. Human capital in the form of skills and knowledge was important for the successful implementation of urban agriculture. Enhancing human capital through health and well-being was also an important motivation behind the participation of some households in home-based agriculture. One of the FGD respondents revealed that she engaged in home-based urban agriculture in order to get "nutrients required for a balanced diet" which is crucial for maintaining healthy bodies (FGD respondent 5, July 2017). The practice of urban agriculture

was therefore dependent on the possession of some livelihood assets and it also helped to increase the assets of the participants.

5.7.3 Transforming structures and processes

The institutions, organizations, policies and legislation that shape livelihoods known as transforming structures and processes in the SLA are important in regulating the operation of urban agriculture. The Bulawayo Urban Agriculture Policy makes provisions for land access, training and technical advice for urban farmers. However, there is a gap between the policy on paper and its application on the ground. The urban farmers in Cowdray Park were not aware of the existence of the city's urban agriculture policy or the legality of urban agriculture. This even extended to the Resident Association's chairperson and representatives who are supposed to be the connecting link between residents and the local councilor. When the Residents Association representative was asked about the city's regulations particularly on Bulawayo's thriving poultry sector she responded as follows:

> It's not allowed, from my understanding it is not really allowed…it is not allowed but due to the current economic situation people are now doing this poultry production to improve their household well-being, it is a source of employment for many and the city council cannot just ask them to cease their operations. (Residents Association Representative, July 2017)

The key informant from a local NGO working with urban farmers expressed concern that some of the urban farmers did not have knowledge on the city's authority guidelines regulating the practice of urban agriculture:

> Some people are not even aware that such guidelines exist. There are no measures taken to ensure that they really follow the guidelines, except maybe discouraging stream bank cultivation through writing the warning on water bill receipts. The problem with backyard gardening is that it is difficult to monitor individual households. The city does not have the capacity to monitor more than 170 000 households in the city. Unless the neighbors register complaints with the counsellor or city council nothing is done to monitor compliance with the guidelines. (ZDDT Field Officer, August 2017)

There is no form of training or technical support even from local NGOs such as the Zimbabwe Democracy and Development Trust which focuses solely on community gardens. Home-based farmers lack financial support and the failure of the Transforming Structures Processes to support this sector militates against its potential of significantly contributing to sustainable urban development. Unlike instances in Cuba where the state played a proactive role in urban agriculture and South Africa where NGOs like Abalimi Bezekhaya and Soil for Life support urban gardeners, home-based urban agriculture in Bulawayo is an individual household matter. In Johannesburg, South Africa, urban farmers are trained by extension workers, NGOs and by other farmers (Malan, 2015). The Urban Agriculture Policy of the City of Cape Town as an example legitimises all public support for UA in Cape Town, such as the provision of free public land, fencing and infrastructure, and inputs; although some argue that it is good on paper, but not in practice (Olivier, 2015). The Bulawayo Urban Agriculture Policy makes provisions for the training of urban farmers but this has been limited to allotment and community gardeners.

5.7.4 Livelihood strategies

Urban dwellers depend on multiple livelihood strategies as they seek to achieve their livelihood objectives (Galhena et al, 2013). The term livelihood refers to the way people earn a living, it is considered as sustainable when "…it can cope with and recover from stresses and shock, maintain or enhance its capabilities and assets, while not undermining the natural resource base" (Scoones, 1998:5). The practice of urban agriculture was one of the various livelihood strategies practiced in Bulawayo. There were civil servants such as teachers, nurses, soldiers, those who work in the private sector and NGOs who also practiced urban agriculture in order to reduce the vulnerability of their households to food insecurity. They were also interested in supplementing their incomes and improving their nutritional statuses. There were individuals who depended on urban agriculture as a source of employment but they also had other livelihood strategies at their disposal. There were some urban farmers who viewed home-based urban agriculture as a source of employment although they also engaged in other income generating projects. For example, Happiness Ngwenya, female and self-employed, stated that:

> To me it is a form of employment and a source of food…You know perfectly well that there are limited employment opportunities in this country of ours particularly for people

like me who are growing old… I am also a cross-border trader. I sell clothing for women. I also farm in my small rural home. (July 2017)

Urban households are largely opportunistic, diversifying their sources of income and drawing, where possible, on a portfolio of activities (Meikle et al, 2001:10). UA "can become a valuable income-generating activity for the unemployed and underemployed …" (Hussain in Rogerson, 1998:172). Studies elsewhere indicate that UA is an important livelihood option and income generating activity for the urban poor. For example, in Malawi, Mkwambisi et al (2011) found that 42.5 per cent of low-income groups and 55.2 per cent of female-headed households used urban agriculture as a source of employment making UA the second largest employer. In cities such as Dar es Salaam, urban agriculture is the second largest employer (20% of those employed) and it forms at least 60% of the informal sector (Jacobi, 2000; Cofie, 2013; RUAF Foundation, 2017). A study in South-eastern Nigeria reported that tree crops and livestock produced in home gardens accounted for more than 60% of household income (Gelhena et al, 2011). Urban agriculture is therefore one of the many livelihood strategies that urban dwellers pursue to reduce their vulnerability to various shocks and stresses.

5.7.5 Livelihood outcomes

The livelihood outcomes derived from the practice of urban agriculture differed from household to household. The outcomes were determined by the initial motivations behind the practice of urban agriculture. The most reported outcome was improved household food security although there were other determinants such as the urban gardener's employment status and access to social capital. This became evident in the increase of number of meals taken by households, the accessibility and availability of food improved by participation in urban agriculture. There was an increase in asset accumulation for some households and self-reported improvement in health caused by the increase of vegetable intake.

5.8 Summary

Urban agriculture is one of the many livelihood strategies that urban dwellers pursue in order to meet their livelihood outcomes and reduce their vulnerability to food insecurity. The perceived

risk of food insecurity and economic vulnerability are instrumental motivations behind household participation in home-based urban agriculture. This chapter sought to answer the research questions that initiated the study through utilising the use of empirical data. The findings of the study reveal that home-based urban agricultural production in Bulawayo is an important livelihood and food security coping strategy. The chapter utilised graphical illustrations, quoted statements and reference to literature on urban agriculture in order to properly condense the results of the study. The following chapter summarises the key findings of the study, draws conclusions and proffers policy recommendations which might assist in ameliorating the factors which militate against the practice of home-based urban agriculture in Bulawayo.

CHAPTER SIX: SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

6.0 Introduction

This study sought to ascertain whether the practice of home-based urban agriculture in Bulawayo acted as a food security coping strategy and investigate the determinants of household participation in home-based agricultural production. The third objective of the study was to examine the factors which hinder the growth and full contribution of urban agriculture to urban household food security. This chapter gives a summary of the findings of the study, which are deliberated upon under sub-headings derived from the objectives of the study. The limitations of the study, areas for future research and the possible policy recommendations are proffered before the conclusion remarks of the study.

6.1 Summary of Findings

6.1.1 Home-based agricultural production, livelihoods and food security

The Household Food Insecurity Access Scale (HFIAS) was used to access household food security. The HFIAS measured the access component of household food insecurity and the research findings show that the majority of the households (71%) were food secure. The explanation behind a large percentage of food secure households could be that the study was conducted in the post-harvest season as food insecurity dominantly prevails during post-harvest transitory periods (Kyaw, 2009). This is despite the fact that almost 33% of respondents who were largely from the moderately or food insecure households used severe food security coping strategies such as skipping meals. Forty nine percent of study respondents saw the practice of urban agriculture as a key food security coping strategy in the face of economic uncertainty. The study respondents acknowledged that there is a link between the practice of home-based agricultural production and household food security. Urban agriculture promotes the increased availability and accessibility of cheap, safe and nutritious food as confirmed in previous studies (Mkwambisi et al, 2011; Kutiwa et al, 2011; Jongwe, 2014; Sebata et al 2014). However, it emerges from the findings of this study that the high levels of food security in the study area cannot be solely attributed to the practice of urban agriculture as 75% of the respondents bought their food from supermarkets and other shops. Urban agriculture plays a supplementary role to

household food security in the study area. This is mainly due to the nature of home-based agricultural production which is confined to small backyards or front yards and thus cannot facilitate the cultivation of maize which is the staple crop of Zimbabwe. This means that urban households have to buy mealie-meal, cooking oil and other groceries from supermarkets and depend on home-based agriculture for vegetables and meat in some instances.

The residents of Bulawayo have varied and diverse livelihood strategies which they pursue to meet their livelihood objectives. Home-based agricultural production is one of the many strategies that they practice in order to reduce their vulnerability to shocks. Households in Bulawayo diversify their livelihoods by engaging in multiple livelihood strategies at the same time. Some of the urban cultivators worked as civil servants, in the private sector and NGOs whilst some engaged in cross-border trading, vending and sewing. Household livelihood diversification is instrumental in reducing vulnerability to shocks and stresses (Galhena et al, 2013). The diversity of the urban livelihoods was found to be instrumental in promoting household food security. This interplay between household food security and livelihood diversification was witnessed in the number of unemployed households found to be food secure (23% of respondents). Clearly food security did not only depend on the employment status, income status or practice of urban agriculture as these households also made use of their social networks in order to have access to food.

The main motivation behind the practice of urban agriculture was for ensuring household food security (64%). However, the motivations behind the practice of home-based urban agriculture were not limited to income and food security as other respondents had issues of taste preferences, health and nutrition concerns. Urban agriculture is often solely looked at through economic lens which is important but other motivations which da Silva et al (2016) call secondary motivations emerge from the experience of gardening itself. These secondary motivations were brought out through the qualitative part of the research which made it possible to gain a deeper understanding of the lived experiences of home gardeners. The findings of this research further reveal that there is a strong relationship between the practice of home-based urban agriculture and livelihood asset accumulation which is crucial for the attainment of sustainable urban livelihoods. Households gained social capital through sharing their gardening experiences with neighbors and friends, financial capital through the sale of produce, human capital through acquiring farming skills through television programs or information sharing with friends. Households utilised

livelihood assets such as physical capital (land and access to water) which they already possessed to successfully implement their projects.

6.1.2 Determinants of household participation in home-based agricultural production

The determinants of household participation in home-based agricultural are clearly delineated through the characteristics of the urban farmers sampled for the purposes of this study. The determinants of household participation in home-gardening are divided into demographic and socio-economic. Gender was a key determinant of the practice of home-based gardening. Women are viewed as the promoters of food security and the practice of home-gardening is often an extension of the roles and responsibilities of women due to its close proximity to the home (Winklerprins and Souza, 2005). Most of the urban gardeners were unemployed (34 percent) and had low incomes of less than US$100. Low incomes were therefore found to be another determinant of household participation in home-based agriculture which is similar to the findings of other urban agriculture studies elsewhere (Smit et al, 1996; Mougeot et al, 1998; May and Rogerson, 1995; Salau and Attah, 2012). In addition, almost half of the participants were married (48%) and had household densities of 3 to 4 people (35%). The need to improve the food security and incomes of their average households were instrumental motivations behind the practice of urban agriculture. The final instrumental determinant of participation in home-based urban agriculture was house ownership which is important in one‘s ability to have access to space (land). It was very difficult for households who were renters to engage in small-livestock production or vegetable production in some instances as they had to share the available land with the house owner. Lack of house ownership by some individuals also meant that they could not expand their agricultural activities without first consulting the owner of the house of which they did not have any guarantee that they would be granted the permission to expand.

6.1.3 Factors militating against the practice of home-based agriculture in Bulawayo

The practice of home-based urban agriculture in Bulawayo faces a number of challenges which limit its effective contribution to urban food security and livelihoods. Home-based cultivators in Bulawayo did not receive any form of financial and technical support from the local government or NGOs. The lack of clarity and awareness of the Bulawayo Urban Agriculture Policy on the ground level exposes the poor farmers to manipulation by politicians. This is particularly true

when it comes to the construction of temporary structures for the rearing of small livestock as in the year 2005 temporary structures which included those used for poultry production in Bulawayo were destroyed under the Operation Murambatsvina or "Operation Clean Up". The poultry producers were not even aware of the number of birds they are allowed to keep and this created uncertainties which hinder the expansion of the sector. Water challenges were reported to be a key challenge to the practice of home-based urban agriculture for 48 percent of respondents. Water rationing adversely affects the implementation of home-based agricultural production activities as the city is located in a semi-arid area. There were some urban farmers who reported that they had resorted to stream bank cultivation where they watered their crops with industrial water effluents in order to deal with water challenges. The use of industrial water effluent, however, may be hazardous to the health of urban farmers. Limited skills (19%) and financial challenges (18%) were also reported as stumbling blocks to the effective practice of home-based urban agriculture. The challenges of home-based urban agriculture in Bulawayo are not new as other urban agriculture studies in different geographic contexts (Mkwambisi et al, 2011; Moyo, 2014; Kutiwa et al, 2014, Sebata et al, 2014) have also reported water and financial challenges, policy irregularities, weak or non-existent extension services, and limited skills as major factors militating against urban and peri-urban agriculture.

6.2 Recommendations

The findings of this study reveal that home-based urban agriculture has the potential of contributing significantly to urban food security and livelihood diversification. There is a need for the Government of Zimbabwe to legalise all forms of urban agriculture. This role should not be only assigned to local governments like the Bulawayo City Council but the national government should play an active role like it does in rural agriculture.

The government should strive to ensure that the macro-economic environment is conducive for urban agriculture related entrepreneurship through the creation of relevant policies. The import of cheap agriculture produce such as broiler chickens should be restricted in order to facilitate the expansion of markets for urban farmers.

Home-based urban agriculture is often limited by land availability. High density suburbs yard areas should be planned with the practice of home-gardening being taken into consideration. The

Local council should also consider setting aside land for the establishment of community gardens especially in Cowdray Park where there are none. The selection criteria for the allocation of these community gardens should not be limited to orphans and widows only but it should also include the unemployed youth and low-income earners who have the desire to engage in urban agriculture.

The study participants in Bulawayo did not have access to agricultural extension workers. Agricultural Technical and Extension Services (AGRITEX) should consider recruiting and deploying extension workers to urban areas. NGOs can also play a pivotal role in equipping urban farmers with the necessary skills to expand their agricultural projects.

The participants of the study depended on their own sources of income or social capital to access inputs such as fertilisers and seedlings. NGOs, local government and the Central government in Zimbabwe should learn from the success stories of countries such as Cuba and NGOs like Soil for Life to fully support home-based urban agriculture through the provision of inputs. The Bulawayo City Council with the help of NGOs should consider drilling more boreholes in the city to help in alleviating water challenges.

The Bulawayo City Council should engage in community education awareness programmes to teach people about the Bulawayo Urban Agriculture Policy. The majority of respondents in this study were not aware of the existence of the Bulawayo urban agriculture policy. The local government should utilise participatory methodologies which include all urban farmers in the attempt to address urban agriculture challenges.

6.3 Limitations and suggestions for future research

This study purposively sampled one low-income neighborhood and the results cannot be generalized to the whole of Bulawayo. The researcher failed to interview a representative from the Bulawayo City Council or government and the Councilor due to bureaucracy and time constraints. These could have added depth on the policy and institutional framework of urban agriculture in Bulawayo to the study. The assessment of household food security using the Household Food Insecurity Access Scale (HFIAS) did not fully cover the utilization aspect of food security. The HFIAS did not help in understanding the day to day variability of household food security. This study only focused on one high density suburb, future studies could do a

comparative analysis of the role played by urban agriculture for different income earners (high density, low density and medium density suburbs). Comparative studies can also be conducted between participating and non-participating households in order to clearly understand if the practice of urban agriculture has a significant impact on the livelihoods of urban residents. Urban agriculture studies should also focus on policy issues in more depth and how urban agriculture can be integrated in urban planning and development. It would be interesting if future studies also focus on the possible contribution of urban agriculture to ameliorating child malnutrition and child poverty.

6.4 Conclusions

The urbanisation process in African countries including Zimbabwe has been accompanied by the urbanisation of poverty. The high unemployment rates and volatile economic environment in Zimbabwe increases the vulnerability of urban households to food insecurity. Urban residents in Bulawayo have adopted urban agriculture as one of numerous livelihood strategies which contributes significantly to household food security. Home-based urban agricultural production is one of the most convenient types of urban agriculture that is being practiced in Bulawayo. The safety and close proximity to the home offered by home-based agriculture makes it to be favorable to urban residents. Home-based urban agriculture in Bulawayo is largely practiced by women, young people (aged 35 and below), who are mostly unemployed and or low income earners.

The primary motivations behind the practice of home-based urban agriculture in Bulawayo are for ensuring household food security and income generation. Urban agriculture acts as a source of employment for some households and plays a role in improving household budgets. The income generated from the sale of agricultural produce (mostly a quarter of their produce) was mainly used to purchase more food, pay school fees and utility bills, buy household assets or a combination of the above. The secondary sources of motivation included maintaining health by consuming more fresh vegetables and safe meat promoting nutritional diversity.

Home-based urban agriculture is a key food security coping strategy in Bulawayo. Households engage in urban agriculture as a strategy of reducing their vulnerability to perceived and real shocks. The nexus between the practice of home-based urban agriculture and food security is centered on its ability to increase the accessibility and availability of safe food, save money

which would have been used to buy vegetables and meat to purchase more nutritious food. However, it is noteworthy that urban households in Bulawayo depend largely on purchasing food from supermarkets and other shops hence urban agriculture plays a complementary or supplementary rather than a sole role in maintaining food security. The level of household food security in Bulawayo hinges on diverse livelihood strategies. There is also a strong interdependence between the livelihood capitals that people possess (human, financial, physical, social and natural) and the ability of a household to practice home-based urban agriculture. There is a strong interdependence for example on the availability of land (natural capital), skills (human capital), the ability to access seedlings and fertilizers (can hinge on financial and social capital) and one's ability to engage in any form of home-based urban agriculture. In addition, there is a strong relationship between the practice of home-based urban agriculture and livelihood asset accumulation which is crucial for the attainment of sustainable urban livelihoods.

The potential of home-based urban agriculture to fully contribute to urban household food security and livelihoods is limited by water challenges, financial challenges, policy irregularities, weak or non-existent extension services, and limited skills. There is a need for collective responsibility by various stakeholders such as the government, Bulawayo City Council and NGOs to strengthen the practice of urban agriculture in Bulawayo. Urban agriculture should be legalized and farmers ought to be equipped with the necessary finances, skills and technical advice to expand their agricultural production. While urban agriculture cannot meet all the food requirements of urban populations it can make small but important contribution in meeting daily food needs through the provision of fresh vegetables and poultry products. Tackling the factors militating against the successful execution of urban agriculture can help to reduce food insecurity and the livelihood challenges experienced by the growing urban populations in Zimbabwe.

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APPENDICES

Appendix A Research Instruments

Appendix A1: Household Questionnaire

Private Bag X17, Bellville 7535, Cape Town, South Africa
Telephone :(021) 959 3858/6 Fax: (021) 959 3865
E-mail: pkippie@uwc.ac.za

Dear Sir/Madam

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

My name is Metron Ziga 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 assess the contribution of Home-based Agricultural production to the food security of households in Bulawayo. 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.

_____

Ms. Metron Ziga

Researcher

Household Questionnaire

Please tick the appropriate box.

SECTION ONE: BACKGROUND INFORMATION				
S/N	**Question**	**Reponses Categories**	**√**	**Codes**
1	Migration History	Born in Bulawayo		1
		Migrated from another town		2
		Migrated from a rural area		3
		Others Specify		4
2	How long have you lived in Bulawayo?	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/College		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 income?	Below $100		1
		Between $ 100 and $ 200		2
		Between $201 and $300		3
		Above $ 300		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	1-2		1

	household?	3-4		2
		5-6		3
		More than 6		4
12	What is the nature of your accommodation status?	Owned		1
		Rented		2
		Owned by a relative		3
SECTION TWO: PRACTICE AND DETERMINANTS OF HOME -BASED AGRICULTURAL PRODUCTION				
13	Do you practice any form of home -based agriculture?	Yes		1
		No		2
14	Why are you practicing Home-based agriculture?	Food		1
		Income		2
		Both (food and income)		3
		Other: Specify		4
15	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
		Combination of the above		6
16	What have you done to accommodate agricultural production at your home?	Use front space of house		1
		Use extra room		2
		Built temporally shelter		3
		Use sacks (vertical farming)		5
		Use backyard space		6
17	What do you do with your agricultural produce?	Sell (**move to Question 18**)		1
		Use for household consumption		2

		(move to question 21)		
		Both (**move to Question 18**)		3
		Others Specify…….....		4
18	How much of your produce do you sell?	All		1
		Half		2
		A quarter		3
19	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
20	To whom do you sell these products?	Market(indicate which one)		1
		Neighbors		2
		Shop in neighborhood		3
		Over the fence		4
		Other: Specify		5
21	How are you financing your agricultural activities?	Own income		1
		Money from relatives		2
		Support from NGOs		3
		Others Specify……..		4
22	Would you like to expand your agricultural activities?	Yes **(Move to Question 23)**		1
		No **(Move to Question 24)**		2
23	What would you require in order to expand your agricultural activities?	Land (space)		1
		Enabling policy		2
		Water		3
		Equipment		4

		Training		5
		Others Specify……		6
24	Who helps you to work in your garden?	No one		1
		Family member		2
		Friend		3
		Paid Support		4
		Other: Specify		5
25	Where do you get main information on how to conduct your agricultural activities?	Television/ radio programmes		1
		Family members		2
		Friends		3
		NGOs		4
		Other: Specify		5
SECTION THREE: HOUSEHOLD FOOD SECURITY (HFIAS adopted with few modifications)				
26	In the past four weeks, did you worry that your household would not have enough food?	No **(Move to Question 27)**		0
		Yes		1
26a	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
27	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 28)**		0
		Yes		1
27a	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		3

		past 4 weeks)		
28	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	No **(Move to Question 29)**		0
		Yes		1
28a	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
29	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 30)**		0
		Yes		1
29a	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
30	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 31)**		0
		Yes		1
30a	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
31	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 32)**		0
		Yes		1

31a	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
32	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 33)**		0
		Yes		1
32a	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
33	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 34)**		0
		Yes		1
33a	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
34	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 **(Move to Question 35)**		0
		Yes		1
34a	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

35	What strategies do you use in order to ensure that your household is always food secure **(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
		Others: specify		8
SECTION FOUR: CHALLENGES				
36	What challenges are you facing while conducting Home-based agricultural production?	Water challenges		1
		Conflicts with neighbors		2
		Limited skills		3
		Fear of arrest		4
		Financial challenges		5
		Other: specify		6
37	What are you doing to address these challenges? 1…… 2…… 3…….. 4…… 5……..			

Appendix A2: Home-based Cultivators Interview guide

1. Why are you engaging in HBA?
    - How long have you been an urban farmer?
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 agricultural activities?
8. What challenges are you experiencing as an urban farmer?

Appendix A3: Key Informant Interview Guide

1. Why do people engage in Home -based agricultural production in Bulawayo?
2. How is Home-based agricultural production contributing to household food security in Bulawayo?
3. What are the guidelines in place to prevent health related hazards?
    - How are the guidelines being implemented?
    - Do urban farmers comply with the city's guidelines?
    - What are the measures taken to ensure that urban farmers 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 A4: Focus Group Discussion Guide

1. Why are you practicing Home-based agriculture?
    - What do you think are the benefits of practicing home-based agriculture?
2. Where do you get your agricultural inputs?
3. How is urban agriculture making differences to your household food security?
4. What measures do you take to make sure that your households always have food?
5. Who are you selling your produce to?
6. How do you use the money gained from selling your produce?
7. What kind of support are you receiving from the local government and NGOs?
8. What would you like to see improved in your agricultural activities?
9. What are the challenges that you are experiencing as urban farmers?

Appendix B: STATA DO-FILE

```
log using urbanagricsurvey.log

doed

label define MgHist 1 "Born in Bulawayo" 2 "Migrated from another town" 3 "Migrated from a rural area"

label value MgHist MgHist

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

label value YrsinByo YrsinByo

label define Gender 1 "Male" 2 "Female"

label value Gender Gender

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 "53-59 years" 8 "60+ years"

label value Age Age

label define MarSt 1 "Single" 2 "Married" 3 "Widowed" 4 "Separated or divorced"

label value MarSt MarSt

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

label value Educ Educ

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

label value EmpSt

label value EmpSt EmpSt

label define SrcInc 1 "Employed" 2 "Relatives" 3 "Government Grant" 4 "NGO support" 5 "Other"

label value SrcInc

label value SrcInc SrcInc

label define MntInc 1 "Below$100" 2 "Between $100-$200" 3 "Between $201-$300" 4 "Above $300"
```

label value MntInc MntInc

label define Srcfd 1 "Buy from supermarkets" 2 "Friends and relatives" 3 "Neighbours" 4 "Other"

label value Srcfd Srcfd

label define Srcfd 1 "Buy from supermarkets" 2 "Friends and relatives" 3 "Neighbours" 4 "NGOs" 5 "Other", replace

label value Srcfd Srcfd

label define EmpSt 1 "Not employed" 2 "Self-employment" 3 "Employed" 4 "Part-time employed" 5 "Other", replace

label value EmpSt EmpSt

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

label value Noinhhd Noinhhd

label define AccStat 1 "Owned" 2 "Rented" 3 "Owned by a relative"

label value AccStat AccStat

label define AccStat 1 "Owned" 2 "Rented" 3 "Owned by a relative" 4 "Other", replace

label value AccStat AccStat

label define ProfHBA 1 "Yes" 2 "No"

label value ProfHBA ProfHBA

replace ProfHBA = 1 in 86

replace ProfHBA = 2 in 86

replace ProfHBA = 2 in 88

label define Mot 0 "None" 1 "Food" 2 "Income" 3 "Both(food and Income)" 4 "Other"

label value Mot

label value Mot Mot

label define AgrType 1 "Poultry" 2 "Animal rearing" 3 "Crop growing" 4 "Vegetable growing" 5 "Horticulture" 6 "Combination of the above" 0 "None"

label value AgrType AgrType

label define AcHBA 0 "None" 1 "Use front space of house" 2 "Use extra room" 3 "Built temporal shelter" 4 "Use sacks(vertical farming)" 5 "Use backyard space"

label value AcHBA AcHBA

replace AcHBA = 5 in 2

replace AcHBA = 5 in 4

replace AcHBA = 5 in 20

replace AcHBA = 5 in 21

replace AcHBA = 5 in 22

replace AcHBA = 5 in 31

replace AcHBA = 5 in 33

replace AcHBA = 5 in 35

replace AcHBA = 5 in 38

replace AcHBA = 5 in 39

replace AcHBA = 5 in 42

replace AcHBA = 5 in 44

replace AcHBA = 5 in 45

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replace AcHBA = 5 in 49

replace AcHBA = 5 in 56

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replace AcHBA = 5 in 65

replace AcHBA = 5 in 67

replace AcHBA = 5 in 69

replace AcHBA = 5 in 71

replace AcHBA = 5 in 74

replace AcHBA = 5 in 76

replace AcHBA = 5 in 77

replace AcHBA = 5 in 81

replace AcHBA = 5 in 83

replace AcHBA = 5 in 87

replace AcHBA = 5 in 91

replace AcHBA = 5 in 92

replace AcHBA = 5 in 94

replace AcHBA = 5 in 96

label define Useofpr 0 "None" 1 "Sell" 2 "Use for household consumption" 3 "Both" 4 "Other"

label value Useofpr Useofpr

replace Useofpr = 3 in 26

label define QuantSld 0 "None" 1 "All" 2 "Half" 3 "A quarter"

label value QuantSld QuantSld

label define Useofmn 0 "None" 1 "Buy food" 2 "Pay household utility bills" 3 "Pay school fees" 4 "Buy household assets" 5 "Other"

label value Useofmn Useofmn

replace Useofmn = 5 in 85

label define Mrkt 0 "None" 1 "Market" 2 "Neighbours" 3 "Shop in neighbourhood" 4 "Over the fence" 5 "Other"

label value Mrkt Mrkt

label define FnAgr 0 "None" 1 "Own Income" 2 "Money from relatives" 3 "Support from NGOs" 4 "Other"

label value FnAgr FnAgr

label define ExofAg 1 "Yes" 2 "No"

label value ExofAg ExofAg

replace ExofAg = 1 in 12

replace ExofAg = 1 in 81

replace ExofAg = 2 in 86

replace ExofAg = 2 in 88

label define Exrequ 0 "None" 1 "Land" 2 "Enabling policy" 3 "Water" 4 "Equipment" 5 "Training" 6 "Other"

label value Exrequ Exrequ

label define Helper 0 "Not applicable" 1 "No one" 2 "Family member" 3 "Friend" 4 "Paid support" 5 "Other"

label value Helper Helper

label define ScofInf 0 "None" 1 "Television/radio programmes" 2 "Family members" 3 "Friends" 4 "NGOs" 5 "Other"

label value ScofInf ScofInf

label define Fdcp 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 "Specify"

label value FdCp FdCp

label value FdCp FdCp

label drop Fdcp

label define FdCp 1 "Skip meals" 2 "Grow on food" 3 "Reduce food portions" 4 "Sell property" 5 "Borrow food" 6 "Eat less prefered food" 7 "Migration" 8 "Other"

label value FdCp FdCp

label define Challnges 1 "Water challenges" 2 "Conflicts with neighbours" 3 "Limited skills" 4 "Fear of arrest" 5 "Financial challenges" 6 "Other"

label value Challnges Challnges

replace Challnges = 6 in 88

label variable QId "Questionaire Identification"

label variable MgHist "Migration History"

label variable YrsinByo "Number of years living in Bulawayo"

label variable MarSt "Marital status"

label variable Educ "Education level"

label variable EmpSt "Employment status"

label variable SrcInc "Source of Income"

label variable MntInc "Monthly Income"

label variable Srcfd "Source of food"

label variable Noinhhd "Number of people in the household"

label variable AccStat "Accomodation status"

label variable ProfHBA "Practice of HBA"

label variable Mot "Sources of Motivation"

label variable AgrType "Type of Agriculture practiced"

label variable AcHBA "Actions to accomodate HBA"

label variable Useofpr "Use of produce"

label variable QuantSld "Quantity Sold"

label variable Useofmn "Use of money"

label variable Mrkt "Market"

label variable FnAgr "Source of Agricultural finance"

label variable ExofAg "Desire to extend HBA"

label variable Exrequ "Type of extension required"

label variable ScofInf "Source of Information"

label variable FdCp "Food security coping strategies"

label variable Challnges "Challenges experienced"

gen HFIAS = Q26a+ Q27a +Q28a +Q29a +Q30a +Q31a+ Q32a+ Q33a+ Q34a

recode HFIAS (0/4=1) (5/11=2) (12/17=3)

recode HFIAS (0/4=1) (5/11=2) (12/17=3)

label variable HFIAS "HFIAS score"

label value HFIAS HFIAS

```
label define HFIAS 1 "Food secure" 2 "Moderately food insecure" 3 "Food secure"
label define HFIAS 1 "Food secure" 2 "Moderately food insecure" 3 "Food insecure", replace
des
tab MgHist
tab YrsinByo
tab Gender
tab Age
tab MarSt
replace MarSt = 1 in 54
tab MarSt
tab Educ
tab EmpSt
tab SrcInc
tab MntInc
tab Noinhhd
tab AccStat
replace AccStat = 1 in 52
tab AccStat
tab Srcfd
histogram Srcfd, percent
tab FdCp
tab ProfHBA
tab AgrType
tab Mot
graph pie, over(Mot)
inspect QuantSld
```

```
tab QuantSld

tab Useofmn

tab Helper

tab ScofInf

tab FnAgr

regress HFIAS Educ EmpSt MntInc Noinhhd
```

Appendix C: Sample of transcripts

Appendix C1: Transcript of a Key Informant Interview
Interview with an NGO Field Officer

Zimbabwe Development Democracy Trust

Time: 15 minutes.

Metron: Why do people in Bulawayo engage in Home-Based Agricultural Production?

KI: People engage in urban agriculture to ensure household food security. It is also a livelihood option for many vulnerable people in this part of the country especially when we take into cognizance the current economic situation. Some people turn to urban agriculture to supplement their incomes. It is an important source of sustenance especially for the poor and vulnerable such as Orphans and Vulnerable Children, widows and unemployed youths.

Metron: How is home-based agricultural production contributing to household food security in Bulawayo?

KI: Like I said earlier, urban agriculture is a livelihood option for many people. Some people sell their produce and buy food. There are some who harvest from their gardens and eat hence issues of food availability and accessibility are promoted. When it comes to food utilization urban agriculture improves the dietary diversity of households especially when it comes to micro-nutrients and proteins (e.g. for the poultry farmers which is a viable activity).

Metron: But does it really make a significant difference to household food security, especially when we consider the small-scale nature of these urban gardens.

KI: Yes it does. The people that we work with particularly in community gardens experience significant changes in their food security statuses although most people grow the staple crops seasonally. They mainly focus on vegetable and poultry production. However, they really can save money during the harvest periods as they would no longer require buying maize meal but they just take their harvested crops to the grinding mill.

Metron: Are you aware of the guidelines in place to prevent health hazards?

KI: The City Council By-laws and Urban Agriculture policy encourages people in High density suburbs like Cowdray Park are only encouraged to keep 25 birds. When it comes to vegetable

production they are discouraged from using raw sewage effluence for watering. However, people continue to practice stream bank cultivation where they use industrial waste for watering. We are not aware yet of the health hazards which might be a result of such activities.

Metron: Do urban farmers comply with the city's guidelines?

KI: Some do but some do not. For example when it comes to poultry production some people keep 100 birds. People always bend rules when they find a loophole.

Metron: What are the measures taken to ensure that urban farmers follow the guidelines?

KI: Some people are not even aware that such guidelines exist. There are no measures taken to ensure that they really follow the guidelines, except maybe discouraging stream bank cultivation through writing the warning on water bill receipts. The problem with backyard gardens is that it is difficult to monitor individual households. The city does not have the capacity to monitor more than 170 000 households in the city. Unless the neighbors register complaints with the counsellor or city council nothing is done to monitor compliance with the guidelines.

Metron: What kind of support are you offering to Home-based cultivators?

KI: There is no support being offered to Home-Based Cultivators at the moment.

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

KI: There is a need of drilling of more boreholes. There are currently no community gardens in Cowdray Park. There is also a need for training urban gardeners so that they can practice sustainable urban agriculture.

Metron: What are the policy measures taken to promote urban agriculture in Bulawayo?

KI: Besides the Urban Agriculture Policy, there are instances whereby Councilors or individuals can approach the City Council to apply for access to land for cultivation. The Local Government has also partnered with various NGOs such as ZEDT, World Vision, Oxfam and ORAP. More boreholes are also being drilled in different locations. I have also noticed that there is a sense of leniency for example I remember here in Cowdray Park the City Council had allocated stands to new residents yet people were practicing off-plot agriculture on those stands. The council allowed them to harvest their crops. However, I think this leniency has been used as a political

strategy in some instances. For example last year during the drought period there was food donated by the World Food Programme which was supposed to target vulnerable food insecure individuals .What happened is that the ruling party ended up politicizing the food distribution programme. Only card members gained access to the food. It happened that after the rainy season the council wanted to slash down crops in undesignated areas, city councilors who are mostly from the opposition parties in this part of the country refused to comply. Hence you can see that this was a strategy to gain political mileage. One councilor actually said that they will only allow crops in their districts to be slashed after the 2018 elections.

Metron: Thank you very much for your time, I don't know if you would like to ask me any question?

KI: You are welcome; no I do not have any questions.

Appendix C2: Transcript of an interview with a Home-based cultivator
Interviewee 2

Venue: Interviewee's Home

Age: 50

Time: 20 minutes

Metron: Why are you engaging in HBA?

Participant: To me it is a form of employment and a source of food. [Laughs] You know perfectly well that there are limited employment opportunities in this country of ours particularly for people like me who are growing old.

Metron: Okay so tell me ….How long have you been an urban farmer?

Participant: I cannot really recall the number of years. I started urban agriculture long back in the 1980s when I moved to Bulawayo from my rural home in Matopo. However, I went to work in South Africa and came back to start more focus particularly on Poultry production on a bigger scale. I have been practicing a combination of poultry production and urban agriculture for approximately 7 years.

Metron: So, do you think your rural background influenced your love for urban agriculture?

Participant: I think it did. Farming has been a practice of my family for ages. I think I developed the love for agriculture at a tender age.

Participant: What are your other sources of livelihood?

Unity: I am a cross-border trader. I sell clothing for women. I also farm in my small rural home.

Metron: What are you producing and how much?

Participant: I currently have 100 broiler chickens, 7 layers and I have vegetables and grow maize. I managed to harvest 7 sacks of maize. I dry some of the vegetables from my nearby streambank garden.

Metron: How do you source your inputs?

Participant: I buy them in town. I also get some seedlings from neighbors and friends.

Metron: How is urban agriculture making differences to your household food security?

Participant: It is making a lot of differences really. My family eats what we grow and I also manage to sell the broilers to earn money to buy more nutritious food such as milk. In the post-harvest season we spend less money on buying food as we can just boil our maize cobs and eat. It is a very nice experience as we can just go to the garden and harvest rather than buying from these GMO stuff

Metron: What measures do you take to make sure that your household always has food?

Participant: I grow what we eat. I always dry vegetables and dry meat for my children to eat. Growing my own food ensures that we can never go to bed hungry.

Metron: Do you sell your produce, if yes to whom?

Participant: Yes I sell the broilers only though. The eggs and vegetables are for household consumption. I sell them to my neighbors, friends and even some of my family members are my good customers.…by the way I also sell the manure from the broiler chickens for a $1 a full sack.

Metron: How much do you sell each bird?

Participant: I used to sell for $10 but recently I lowered them to $8 a bird because of tight competition, more people are venturing into broiler production.

Metron: If you sell your produce, what do you use the money for?

Participant: I use the money to buy electricity, pay water bills, pay school fees and buy more food such as milk and fruits.

Metron: What kind of support are you receiving from the local government and NGOs?

Participant: The support that I have received so far is from the Residents Association. They just encourage us to clean up our fowl runs in order to avoid conflicts with neighbors and health hazards. There is no support whatsoever that I have received from the local government or the Member of Parliament.

Metron: So tell me, are you aware of the Bulawayo City Council Urban agriculture guidelines?

Participant: No I am not aware of them.

Metron: What would you like to see improved in your agricultural activities?

Participant: I would like to expand my layer production. I wish to get more birds. I wish that I could also have a stable supply of water all year round. I think the city council should drill more boreholes. I am also thinking of venturing into broiler egg hatching. I am investing on getting an incubator from South Africa.

Metron: What challenges are you experiencing as an urban farmer?

Participant: Besides water challenges, the space here is limited that is why I have converted a room to a fowl run. There are also challenges of market competition, as I said before more people are turning to poultry production as a livelihood strategy. People also steal our vegetables and maize in the stream bank gardens… what can we do, we will eat with the thieves as they will not harvest everything.

Metron: Thank you very much for your time.