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The state of urban food insecurity in Malawi's four major cities

By

Leonard Maximian Mkusa

Submitted in partial fulfilment of requirements for the degree

MSc Agric (Agricultural Economics)

in the

Department of Agricultural Economics, Extension and Rural Development

Faculty of Natural and Agricultural Sciences

University of Pretoria

South Africa

April 2020

DECLARATION

I, **Leonard M. Mkusa**, student 17224617 declare that this dissertation, which I hereby submit for the degree MSc(Agric) Agricultural Economics at the University of Pretoria, is my own work and has not been submitted by me for a degree at this or any other tertiary institution.

Signature: 

Date: 24 April 2020

DEDICATION

This dissertation is dedicated to my late brothers, Francis and Daniel. I will not forget the inspiration you gave me to reach this far. I really miss you.

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Finally, I wish to thank God for his amazing grace which he abundantly poured on me the past two years I was doing my studies. Glory be to Him always.

The state of urban food insecurity in Malawi's four major cities

By

Leonard Maximian Mkusa

Degree: MSc (Agric) Agricultural Economics
Department: Agricultural Economics Extension and Rural Development
Supervisor: Prof Sheryl L Hendriks

ABSTRACT

The world population is rapidly urbanising. As the majority of urban dwellers in Africa are net food buyers, they are vulnerable to income and food price shocks. At the current rate of urbanisation, food insecurity is likely to pose a significant future challenge. There is a paucity of available studies on urban food security in Africa and more so for Malawi where most food security analyses focus on rural contexts. This study set out to address this deficiency. The study compared the levels and severity of food insecurity in Malawi's four major cities: Blantyre, Lilongwe, Mzuzu and Zomba and identified the groups most vulnerable to food insecurity. The data of 1728 urban households were drawn from Malawi's fourth Integrated Household Survey (IHS 4) of 2016/17.

Six available food security indicators (the Household Dietary Diversity Score, the Food Consumption Score, the Months of Adequate Household Food Provisioning, the reduced Coping Strategies Index, an asset index and food expenditure as a share of total household expenditure) were used to compare food insecurity in the four cities. A bivariate analysis of the proportions of food-insecure households was conducted to establish the severity of food insecurity. Correlation analysis was employed to identify the groups most vulnerable to food insecurity.

The majority of food-insecure households were located in the Lilongwe and Zomba districts. The majority of households had acceptable levels of food consumption and dietary diversity. On average, households reported having adequate food availability for eight months of the

year. December, January and February were reportedly the most difficult months in terms of food access. Forty-three percent of the sampled households were food insecure based on the reduced Coping Strategies Index. A third of the total sample population spent over 75 percent of their budget on food. On average, households owned seven (out of ten) classes of assets. Most households applied two of the five coping mechanisms during the survey period. The consumption of less preferred or cheaper foods was the most commonly used coping strategy. Poor households, households headed by uneducated people, households with a high number of dependents, households with fewer income sources and male-headed households were identified as the groups most likely to experience food insecurity in these cities.

The study concluded that urban food insecurity was relatively low and less severe in the four Malawian cities compared to published statistics on rural areas despite rapid urban population growth. However, some households had difficulties in accessing enough food during certain months of the year, implying a seasonal dimension to food insecurity. Food insecure urban households in Malawi's cities tend to adopt less severe food coping strategies that are less likely to compromise their long-term food consumption. Across Malawi's major cities, households most vulnerable to food insecurity were typically large poor, male-headed households with an uneducated head and many dependents. Vulnerable households had limited sources of income and no access to credit. Based on these findings, the study accepted the hypothesis that the above identified groups were more vulnerable to food insecurity.

Any intervention that seeks to increase the availability and accessibility of quality livelihood options for urban households in Malawi would likely improve food security and reduce vulnerability for specific categories of households. There is a need to design cost-effective, well-targeted social protection instruments to help the most vulnerable cope with income or price shocks and build assets. The government needs to intensify skills development programs for the self-employed as well as those seeking or already in wage employment that will improve the quality of labour, thereby improving their probability of securing a decent livelihood. Urban households could diversify their income portfolios through engaging in micro to small and medium enterprises to supplement the existing livelihood sources. Households need to increase their savings to cushion them in the event of income and price shocks. Where possible, urban households could adopt homestead food production, specifically focusing on the nutrient dense foods such as green-leafy vegetables.

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LIST OF ACRONYMS AND ABBREVIATIONS

EAs	Enumeration Areas
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
FCS-N	Food Consumption Score for Nutrition
FEWS NET	Famine Early Warning Systems Network
FGDs	Focus Group Discussions
GoM	Government of Malawi
HDDS	Household Dietary Diversity Score
IFPRI	International Food Policy Research Institute
IHS	Integrated Household Survey
MAHFP	Months of Adequate Household Food Provisioning
MGDS	Malawi Growth and Development Strategy
MUFPP	Millan Urban Food Policy Pact
MVAC	Malawi Vulnerability Assessment Committee
NAIP	National Agriculture Investment Plan
NAP	National Agricultural Policy
NCDs	Non-Communicable Diseases
NSO	National Statistics Office
PHC	Population and Housing Census
PPP	Purchasing Power Parity
PSU	Population Sampling Unit
rCSI	Reduced Coping Strategy Index
SAPs	Structural Adjustment Programmes
SDGs	Sustainable Development Goals
WFP	World Food Programme

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CHAPTER 1:

INTRODUCTION

1.1. Background

By the turn of the 20th century, there were only twenty cities globally, with populations exceeding a million people (UN-Habitat, 2008). At the beginning of the 21st century, this figure rose to about five hundred (UN-Habitat, 2008), with three-quarters located in developing countries (Cohen, 2004). By 2016, over half of the world's population was living in urban centres (UN-Habitat, 2016). This proportion is likely to rise to 70 percent by 2050 (UN DESA, 2018). Most of this growth is expected to occur in developing countries (UN-Habitat, 2016).

Urbanisation in its own right is considered a positive development as it makes urban areas to be more productive than rural areas and, therefore, an important driver for economic growth and development (Overman and Venables, 2005). Yet, rapid urbanisation which is more prevalent in third-world countries has the potential to outstretch capacities for cities to absorb and provide for the ever-growing population.

Unabsorbed rapid urbanisation negatively affects all the elements of food security, especially considering that most urban dwellers are net food buyers who usually spend a more substantial proportion of their disposable income on food (Matuschke, 2009). The experience from the 2007/2008 food crisis demonstrated that urban poor were particularly more vulnerable to food price swings (Rosset, 2008). As the prices for staples rose sharply between 2007 and reached the all-time highest in 2008, the urban poor were hit the hardest which resulted in food-related conflicts (Cohen and Garret, 2010).

The 1948 Universal Declaration of Human Rights recognises food security as a human right (UN, 2015:52). Despite the right to food being incorporated into regional agreements and national constitutions, addressing food insecurity in developing countries remains a significant challenge (Sasson, 2012; Aberman *et al.*, 2018). However, various efforts to address food insecurity are being made at the international, continental as well as regional

levels (UN, 2018). For example, the 2030 Agenda for Sustainable Development (SDGs) goal two aims at ending hunger and achieving food security, improved nutrition and promoting sustainable agriculture (UN, 2015).

Food security and nutrition for all are central to many continental and regional agreements, such as the post-2015 Agenda for Sustainable Development, the African Agenda 2063, the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods and the SADC Food Security and Nutrition Strategy. However, there is not much consideration of urban food security in these agreements and strategies despite recent international attention through agreements such as the 2016 United Nations Urban Agenda (NUA) and the 2015 Millan Urban Food Policy Pact (IFPRI, 2017).

Malawi is one of the least urbanised countries in sub-Saharan Africa, with only 15 percent of its population living in urban areas compared to those in rural areas (NSO, 2015). However, in 2013 the United Nations Human Settlement Programme (UN-Habitat) projected that by 2030, about 32 percent of Malawi's population will be living in urban areas (UN-Habitat, 2013:11). On average, three percent of the rural population of Malawi move to urban areas annually in search of a better life and other livelihood opportunities (Chilanga *et al.*, 2017). As a result, living conditions in urban centres, especially in informal settlements have deteriorated, including access to basic services such as food, clean water and decent housing (Riley *et al.*, 2018).

Many agencies working in Malawi claim that food insecurity is higher in rural areas than in urban areas (IFPRI, 2017; FAO, 2017). It is also reported that Malawi's rural households depend primarily on their own production for consumption and rarely purchase food (Kankwamba *et al.*, 2012). However, in times of shock, rural households rely on remittances, and assistance from both government and non-governmental organisations. In contrast, in urban Malawi, people depend on food purchases as opposed to production (Aberman *et al.*, 2018). As a result of being net food buyers, urban households in Malawi are more susceptible to food price fluctuations compared to rural households (Manda, 2013). The susceptibility of most urban poor is compounded by limited job opportunities available in urban areas. Urban dwellers residing in informal settlements are particularly at risk of food insecurity due to poor living conditions including inadequate water, sanitation, hygiene and health care facilities (Manda, 2013).

1.2. Statement of the problem

Despite an overwhelming focus on food security and nutrition in Malawi by government, civil society organisations and other non-governmental organisations through programmes such as food for work, scaling up nutrition and the farm input subsidy among others, most food security and nutrition policies, strategies and guidelines are silent on urban food security (Riley *et al.*, 2018). However, food security for all is recognised as a right in Malawi's 1994 constitution (GoM, 1994). The constitution holds the state accountable for ensuring that everyone in Malawi has access to sufficient and nutritious food all year round (GoM, 1994). Malawi's Vision 2020 (GoM, 2000:11) seeks to ensure the realisation of the right to food for all (GoM, 2014).

As a way of ensuring that Malawi achieves food security and improved nutrition for all, several policies and strategies have been developed over the years. Some of the food security and nutrition-related policies and strategies include but are not limited to:

- The 2016 National Agricultural Policy (NAP) which seeks to promote food security through increased production of diversified food crops to foster better nutrition (GoM, 2016).
- The 2017/18-2022/23 National Agricultural Investment Plan (NAIP) which seeks to address challenges facing the agricultural sector in Malawi, including low agricultural productivity (GoM, 2017).
- The 2018-2030 National Resilience Strategy (NRS) envisions a country “where people are resilient to economic and environmental shocks that affect their lives and livelihoods.” (GoM, 2018:13)
- The 2018-2022 National Multi-Sector Nutrition Policy (NMNP) seeks to support high impact- nutrition-specific and nutrition-sensitive interventions at a larger scale (GoM, 2017).

Most studies in sub-Saharan Africa suggest an increase food insecurity in most urban centres of some countries in the region (Frayne *et al.*, 2018; Riley and Legwegoh, 2018; Battersby and Haysom, 2018). Despite increasing evidence of food insecurity in Africa, there are no reliable studies on the urban food security situation in the four major urban centres of Malawi. Many of the existing food security studies in Malawi are drawn from rural areas

(Hadju *et al.*, 2009; Makombe *et al.*, 2010; Kassie, 2015 Radchenko, 2018). Nevertheless, food insecurity continues to affect the urban areas as much as it affects the rural areas.

Only three available studies report findings for urban food security in Malawi (Mvula *et al.* 2013; Chilanga *et al.*, 2017; Riley *et al.*, 2018). None determined how severe food insecurity was or identified the most vulnerable groups.

1.3. Study objectives

The primary objective of this study was to assess the levels and severity of urban food insecurity in Malawi's four major cities, namely Blantyre, Lilongwe Zomba and Mzuzu and identify the most vulnerable groups from the secondary data obtained from the fourth Integrated Household Survey (NSO, 2017). The study seeks to address the following three specific objectives:

- i. Compare the levels of food insecurity in the four main urban centres in Malawi using the Food Consumption Score, the Household Dietary Diversity Score, and food expenditure as a share of total household expenditure, the reduced Coping Strategies Index, the Months of Adequate Household Food Provision and an asset index.
- ii. Determine the severity of food insecurity in the four main urban centres in Malawi and compare the findings across cities through bivariate analyses of proportions across the six food security indicators.
- iii. Identify groups of the most vulnerable people to food insecurity in each of the cities using spearman's rank correlation analysis.

1.4. Study hypotheses

The first hypothesis of the study was that there were no significant differences in the levels of food insecurity across the four main urban centres of Malawi, considering that all cities experience have similar annual population growth rates – an average of three percent per annum (NSO, 2018). As a result, all cities experience the same challenges, including, but not limited to an increase in the number of informal settlements and increased unemployment. As the urban population increases, pressure is exerted on resources such as land, water and

livelihood opportunities (Szabo, 2016). As a result, most people, especially the poor, struggle to adequately meet their food needs because they often do not have the means to access better livelihood opportunities (IFPRI, 2017). As the four study urban areas are the major cities in Malawi, one expects the cities to experience similar pressures from rapid population growth, negatively affecting the ability of the urban dwellers to produce food and earn enough money to buy food. As a result, they will be food insecure.

The second hypothesis was that there were no significant differences in the severity of food insecurity among the four main urban centres in Malawi. As the urban population increases, so does the demand for goods and services, which can lead to job creation (Battersby, 2016). The more available livelihood opportunities are proportional to the growing urban population, the more likelihood that living standards can improve (Tumaini *et al.*, 2016). When faced with food insecurity, households apply precautionary coping strategies (Agada and Igbokwe, 2014). Since the four main urban centres in Malawi experience almost similar population growth, more job opportunities should be created due to increased demand for goods and services. As such, it is expected that when faced with food shortages, urban households will engage in additional income-generating activities to maintain their level of food consumption.

The third hypothesis was that households with fewer dependents, male-headed households, households with more educated heads, households with diverse livelihoods sources, households with access to credit and wealthier households would be less vulnerable to food insecurity (WFP, 2012; RTI International, 2014). Due to higher literacy rates among urban dwellers, urban household sizes tend to be smaller than rural households and the proportion of consumers to workers lower, making it easier to feed and take care of household members compared to rural households (Chagomoka, 2016). Male-headed households are often regarded as less vulnerable to food insecurity compared to female-headed households because men often have better access to more productive assets and livelihood opportunities, which help them to mitigate various shocks (Pieters *et al.*, 2013). Rapid urban population growth increases the demand for goods and services. This fosters economic growth, which may lead to poverty alleviation (Tacoli *et al.*, 2015), offering decent livelihoods that reduce vulnerability to food insecurity (Macarthy *et al.*, 2018).

1.5. Outline of the dissertation

This dissertation consists of seven chapters. The introductory chapter has presented a background to the study and set out the statement of the problem, study objectives, hypotheses and study limitations. Chapter two discusses relevant literature on the topic and argues that urban food security does not attract the same attention as rural food security despite some evidence of rising food insecurity in urban centres, particularly in developing countries. The rise in urban food insecurity is compounded by rapid urban population growth. Despite recognising urban food security as a challenge, most global, continental and regional initiatives fail to explicitly address it. The third chapter discusses the research methods specific to this study. Chapter four describes the study context, beginning with the country context and then the context of the four cities. Chapter four presents the findings on the socio-demographic characteristics of the sampled households. Chapter five outlines and discusses the findings of the levels and severity of food insecurity. The sixth chapter presents and discusses the most vulnerable people to food insecurity. The final chapter provides the study conclusions and recommendations.

CHAPTER 2:

LITERATURE REVIEW

2.1. Introduction

In 2007, the first time in history, half of the world's population was living in urban areas (UNFPA, 2007). It has been projected that by 2050, 70 percent of the global population will be living in urban centres, with approximately 92 percent of the world's urban population residing in developing countries (UN, 2015). A substantial proportion of the urban population growth is attributed to rural-urban migration (UN-Habitat, 2016). In general, urban centres offer greater access to employment opportunities, health facilities, education, intellectual development and other social amenities (Diehl *et al.*, 2019). However, in most developing countries current urbanisation rates exceed governments' ability to meet the growing needs, burdening the existing infrastructure and the provision of basic needs and services (Ruel *et al.*, 2017).

As the urban population grows, urban dwellers, particularly the poor face unique challenges around accessing nutritious food, adequate water, sanitation and hygiene facilities, adequate employment and social protection; all of which affect food security and nutrition (IFPRI, 2017). Of late, urban food security is slowly finding its place on the global agenda though still often overlooked at continental and national levels (FAO, 2018). Nevertheless, various initiatives, policies and strategies at global, continental and national levels do not or only partly highlight urban food security issues.

The 2030 Agenda for Sustainable Development includes specific goals on food security and nutrition (SDG 2) and urbanisation (SDG 11). Despite having these goals, the Agenda fails to explicitly recognise food insecurity as an urban as much as it is a rural problem. However, the New Urban Agenda through the Milan Food Policy Pact (MUFPP) brought urban food policy into perspective (FAO, 2017). Considering the rate at which the African continent is urbanising, its governments need to take urban food security issues seriously. Deliberate efforts have to be made at continental and national levels to clearly address urban food security, as it is critical for achieving the post-2015 Sustainable Development Goals (SDGs).

Rapid urbanisation poses several challenges for urban dwellers, among which food insecurity is one. The next section discusses some of the implications of urbanisation for food security.

2.2. Implications of urbanisation for food security

Food security is said to exist when all people at all times have access to adequate, safe and nutritious food required to meet their dietary needs and preference to lead an active and healthy life (FAO, 1996). The definition of food security revolves around four interrelated components of food availability, accessibility, utilisation and stability (CFS, 2012). The linkage between these four elements implies that in addition to the food being physically available, it has to be financially and physically accessible to everyone and that people's bodies should be able to use the food properly. The final food security dimension of stability cuts across the other three elements meaning that food has to be available, accessible and utilised sustainably. All these four dimensions of food security are affected by urbanisation as discussed in the following sub-sections.

2.2.1 Food availability

High rates of urbanisation pose severe challenges to food availability through disrupting food production (Szabo, 2016). A growing urban population means an increase in demand for food in urban areas, as such food production has to increase at a rate higher than the urban demand growth (Crush and Battersby, 2016).

As cities expand, prime agricultural land may be converted into residential or industrial areas (Vorley, 2016). Such transition is often associated with crowding out of peri-urban agriculture which is an important source of most perishable foodstuffs (Matuschke and Kohler, 2014). Besides, urbanisation affects the tenure systems through increasing pressure on customary land thereby necessitating the movement of agricultural production to less productive areas (FAO, 2015).

Another resource that is affected by urbanisation is water, which as an essential component in food production. Urban population growth increases the demand for water for industrial and

domestic purposes including drinking, washing and bathing, this creates competition with water required for agricultural purposes and consequently affecting food supplies (Satterthwaite, 2010).

2.2.2 *Food accessibility*

Access to food is an essential dimension of food security. It encompasses physical and financial access (CFS, 2012). Physical access to food depends on the availability of improved infrastructure such as markets and good quality roads (Radford and James, 2013). Urbanisation impacts physical food access differently in developed and developing countries. In developed countries, urbanisation is associated with improvement in infrastructure, which in turn improves food accessibility (Frongillo *et al.*, 2018).

On the contrary, a lack of improved infrastructure such as functional road networks in most developing countries makes food access difficult (Frayne and McCordic, 2015). Growing urban populations in developing countries put pressure on already inadequate infrastructure (Chikanda *et al.*, 2018). As a result, transportation and storage of food are compromised, especially perishable food from areas of production (usually rural areas) to urban areas.

Financial access to food is concerned with the purchasing power of consumers (FAO, 2012). Erratic food supplies in urban centres of most developing countries lead to high price fluctuations, which hurt the poor urban dwellers who are mostly net food buyers (Godfray *et al.*, 2010). The majority of urban dwellers in most developing countries purchase 90 percent of the food they consume (Maxwell *et al.*, 2000). In addition, in developing countries, the urban poor have higher food expenditure shares than the rural poor (Tawodzera, 2012). This means that urban inhabitants are more dependent on cash income which is generally derived from employment opportunities. However, employment opportunities continue to diminish in the face of rapid urbanisation, making it hard for unemployed people to afford quality food in the right quantities (Crush, 2018).

2.2.3 *Food utilisation*

A growing urban population has important implications for food utilisation (Lerner and Eakin, 2011). Considering that most people living in urban areas are net food buyers, they are susceptible to price volatility which affects the consumption of food and other non-food

commodities (Szabo, 2016; Macarthy *et al.*, 2018). High food prices force urban residents, especially the poor to purchase low-quality food, which is usually low in nutritive value, affecting their nutrition status (Bellemare, 2015).

Food utilisation is affected by other aspects such as access to improved water sanitation, hygiene and health care (CFS, 2012). The importance of safe drinking water and improved sanitation to food security and nutrition cannot be overemphasised. Having improved water, sanitation and hygiene (WASH) facilities is just as necessary as having sufficient and nutritious food. Without access to proper water, sanitation and hygiene (WASH) facilities food can easily be contaminated thereby causing numerous diseases such as diarrhoea and compromising the nutrition status of an individual (WHO, 2014).

A rapid increase in urban population is often associated with a corresponding rise in informal settlements, which are typically characterised by poor sanitation and hygiene and health care facilities (Matuschke, 2009). Such conditions put the inhabitants of these informal settlements at a higher risk of various infections which can affect food absorption by the bodies and ultimately compromise their nutrition status (WHO, 2018).

Rapid urbanisation increases the demand for relatively cheaper foodstuffs due to diminishing livelihood opportunities (Battersby, 2016). Healthy foods may be expensive for the poor. As a result, they resort to consuming cheaper food alternatives, usually concentrated with fats and sugars that may result in malnutrition and other nutrition-related diseases (WHO, 2015). For example, statistics from the Food and Agricultural Organisation have shown a rapid increase in the prevalence of obesity in countries experiencing rapid urbanisation as compared to those experiencing moderate urbanisation (FAO, 2019).

2.2.4 *Food stability*

Food stability entails that an individual or a household has enough food at all times and is not risk losing food access due to sudden shocks including economic and climatic (FAO, 2006). Rapid urban population growth puts pressure on livelihood opportunities, leaving the most impoverished urban residents depending on low-paying jobs (Szabo, 2016) compromising the ability of urban dwellers to maintain stable food consumption (von Braune and Tadese,

2012). As a result, poor urban dwellers are susceptible to food price fluctuation, which puts them at risk of future food insecurity.

2.3. Global food security and urbanisation policy context

Urbanisation trends in developing countries will continue affecting food security and nutrition through the continued increase in demand for food (Ruel *et al.*, 2017). The Sustainable Development Goal 11 seeks to “make cities and human settlements inclusive, safe resilient and sustainable” (United Nations, 2017). Through the inclusion of targets related to housing, disaster risk reduction, participatory planning and other issues, the goal recognises significant challenges facing cities globally (Szabo, 2016). However, the goal fails to explicitly highlight how rapid urban population growth affects the demand for food supplies and urban diets (Crush, 2018). The omission of food security in the Sustainable Development Goal 11 (sustainable cities and communities) presents an urgent need to be addressed considering that by 2030 the global population will even be more urbanised (Battersby *et al.*, 2017).

The United Nations New Urban Agenda (NUA) adopted in 2016 at the Habitat III conference in Quito, Ecuador, brought the urban context into perspective (UN-HABITAT, 2017). Generally, the NUA provides a comprehensive strategy for achieving the post-2015 global Agenda for Sustainable Development (UN 2016:3). Unlike the SDGs, the NUA puts emphasis on actors in the urban food system (Parnell, 2016). The NUA acknowledges the opportunities for innovation that come along with growing urban population which include, but are not limited to increased economic activities allowing more people access to jobs and improved social amenities (UN-Habitat, 2016). The urban poor are specifically placed at the heart of the NUA as depicted in section 39: “We will promote the integration of food security and the nutritional needs of the urban residents, particularly the urban poor, in urban and territorial planning, through the inclusion of small-scale actors along the food supply chain in order to end hunger and malnutrition” (UN-Habitat, 2016).

Cities and other urban centres generally face a wide range of food insecurity and nutrition-related challenges. As such, they are considered important actors in the process of ending hunger and improving food security and nutrition (Ruel *et al.*, 2017). In 2015 mayors of 137 cities from across the globe signed an agreement on urban food policies known as the Millan

Urban Food Policy Pact (MUFPP). To date, the MUFPP is the only global joint declaration of the mayors on urban food policies. It commits cities to work together to develop food systems that are sustainable, fair, climate-friendly, safe and inclusive that would allow for the provision of affordable and healthy food for everyone (Candel, 2019). Generally, the pact provides a framework for cities to develop and implement food policies that are in line with the 2030 Agenda for Sustainable Development and the New Urban Agenda. Currently, there are 145 signatory cities to the pact representing over half a million citizens. A vast majority of the signatory cities are from Europe (74) followed 22 from Africa and 11 from North America. The pact provides an opportunity for city-to-city learning through sharing of experiences and best practices in food systems implementation (Candel, 2019).

Cities are taking various initiatives to address food security and nutrition amid challenges faced (FAO, 2018). Since the adoption of the Milan Urban Food Policy Pact, tremendous progress with regards to food security and nutrition has been reported by the Food and Agricultural Organisation, which include the integration of food security, nutrition and other priorities such as climate change, poverty and economic development into urban policies by most cities globally (FAO, 2018).

2.4. Urbanisation context in Africa

The African population is predominantly rural, yet is considered as one of the fast urbanising regions in the world (UN-Habitat, 2016). The urban population in Africa was projected to triple from 395 million (40%) to 1.339 billion (60%) between 2010 and 2050 (UN-Habitat, 2013). By 2050, the urban population in sub-Saharan Africa will double from 472 million in 2018 making it the fastest grown region in the world (UN-Habitat, 2018).

At present, there are only seven megacities with a population of over ten million. However, the number is expected to increase to ten over the next 15 years (IFPRI, 2017). However, most significant urban population growth will occur in small to medium-sized cities – those cities with a population of less than one million (Buhaug and Urdal, 2013).

Generally, urbanisation is considered as a driver for economic development as it allows the urban areas to grow faster than the rural areas (UN-Habitat, 2016). However, as it is occurring in the global south, it strains the capacity of the urban areas to meet the needs of

the ever-growing number of urban dwellers (Singh *et al.*, 2014). Urbanisation in Africa is shaped by processes that are different from those in other parts of the world (Little, 2013). African urbanisation is characterised by unplanned and unregulated growth, primarily due to weak urban planning institutions (Collier, 2016). Most African urban centres are characterised by high unemployment rates and the predominance of informal job opportunities (AU, 2017).

The inability of most African countries to properly manage urbanisation puts urban dwellers at risk of being vulnerable to several shocks (FAO, 2018). Recent statistics from the United Nations Human Settlement Programme (UN-Habitat, 2017) have shown a significant rise in urban poverty, with about half of the urban dwellers in Africa living on less than \$1.25 a day. Urban poverty in Africa is accompanied by a rapid increase in the number of slums which are home to three in five urban dwellers (World Bank, 2017). In sub-Saharan Africa, the number of people living in slums more than doubled from 102 million in 2000 to over 300 million in 2016 (World Bank, 2017; UN-Habitat, 2016). These slums are generally characterised by sub-standard living conditions such as poor and inadequate sanitation and hygiene facilities (UN-Habitat, 2018). As a result, the slum occupants are exposed to various infections which also affect their nutrition status.

2.5. Food security and nutrition in Africa

Little progress has been made towards achieving food security and nutrition in Africa (FAO, 2018). The prevalence of undernourishment declined between 2000 and 2017 in Africa (FAO, 2017). However, recent statistics from the Food and Agriculture Organisation (FAO, 2019) show that 19.9 percent of Africa's population is still undernourished. The number of undernourished people rose from 222 million (21.9 percent) in 2016 to 237 million (22.5 percent) in 2018 (FAO, 2019). This rise can be attributed to adverse climatic conditions in recent years (USAID, 2018). Severe food insecurity has also risen in the region (FAO, 2018; IFAD, 2018; FAO, 2019).

The implications of child stunting for both personal development and national development have been well documented (Dewey and Begum, 2011; Hoddinott *et al.*, 2013; Prendergast and Humphrey, 2014). About three in ten children under the age of five are stunted in Africa (WFP, 2018). Despite an increase in the absolute number of stunted children under the age of

five from 50.3 million to 58.8 million between 2000 and 2018, the proportion declined from 38 percent to 28 percent within the same period (UNICEF, WHO and World Bank, 2019).

Wasting among children under the age of five is often associated with acute starvation (Harding *et al.*, 2018), often exacerbated by other factors such as inadequate health care, sanitation and hygiene (WHO, 2016). Over 70 percent of children under the age of five are wasted in Africa, with the Northern and Western parts of Africa constituting the highest proportion of wasted children (81 percent) (FAO, 2018). Other international organisations have argued that the true extent of wasting in Africa could be much higher than currently reported, especially in areas of protracted conflict (WFP, 2017; WHO, 2016).

Overweight is also another form of malnutrition that is on the rise in Africa, especially in urban centres (Popkin *et al.*, 2019). The prevalence of overweight among children under the age of five is currently 4.9 percent (FAO, 2019). Overweight is also a significant challenge among adults. Urbanisation and dietary changes have been identified as the main drivers of adult overweight (Sartorius *et al.*, 2015). Cois (2015) found lack of exercise among urban adults and an increased intake of high fat and sugar foodstuffs as the primary contributors to overweight in South Africa.

In Africa, 38 percent of women of the reproductive age have anaemia; surpassing the global average (32.8 percent) (IFPRI, 2018). In extreme cases, anaemia can lead to mortality and morbidity of the mother and child (WHO, 2014). Anaemia affects women's health, quality of life and child learning, affecting the economic development of the continent in the long run (Nair *et al.*, 2016).

As shown by various malnutrition statistics highlighted in this section, achieving food security and improved nutrition for all remains a challenge for Africa. However, various efforts are being undertaken in the African continent to ensure food security and nutrition, as discussed in the following section.

Table 2.1: A Summary of urban food security studies in Africa

Case Study (year)	Authors	Methods	Summary findings
Windhoek, Namibia (2012)	Pendleton <i>et al.</i> (2012)	<ul style="list-style-type: none"> Household Food Insecurity Access Prevalence (HFIAP) indicator Share of food expenditure in total expenditure 	<ul style="list-style-type: none"> 77 percent of the sampled population were food insecure based on the HFIAP. Households situated in informal settlements consumed an average of three or less food groups out of the twelve food groups per week as compared to five food groups by those residing in formal or planned areas. On average, households in Windhoek spent about 36 percent of their budget on food.
Manzini, Eswatini (2012)	Tevera <i>et al.</i> (2012)	<ul style="list-style-type: none"> Household Food Insecurity Access Scale Household Dietary Diversity Score Months of inadequate food provisioning Coping Strategies Index (CSI) 	<ul style="list-style-type: none"> On average, the sampled households consumed three out of the twelve food groups, meaning that their dietary diversity was inadequate. Four out of every five households reported not having enough food a year before the survey. The months of January, February, March, October and December were reported as the worst in terms of food access by a majority of the households (75 percent). Seven out of every ten households applied the strategy of relying on less preferred or less expensive food.
Lusaka, Zambia (2013)	Mulenga (2013)	<ul style="list-style-type: none"> Household Food Insecurity Access Scale Months of inadequate food provisioning 	<ul style="list-style-type: none"> Three-quarters of households were food insecure as determined the Household Food Insecurity Access Scale (HFIAS). A majority of households (85 percent) reported difficulties in accessing food throughout the year, most of whom had enough food for less than half of the year. Food price fluctuation was reported by three out of five of the households as the main reason for difficulties in accessing food especially among the most impoverished urban households.

2.6. Policies and commitments supporting food security and nutrition in Africa

The evidence presented in the previous section has shown that a significant amount of work needs to be done if food insecurity and malnutrition are to be eradicated in Africa. Several initiatives are being implemented to achieve food security for all at the continental level. However, urban food security issues are not reflected in most continental and regional efforts.

The African Union Agenda 2063 outlines a vision for the development of the African continent through fostering inclusive growth and sustainable development (AU, 2014). The agenda is central to ending hunger and halving poverty in line with the global 2030 Agenda for Sustainable Development (AU, 2014). The first ten-year implementation plan for the African Union Agenda 2063 covers the period 2015 to 2025; reaffirmed in the Malabo Declaration on “Accelerated Agriculture Growth and Transformation for Shared Prosperity and Improve Livelihoods” (AU, 2015). Among other efforts, the Agenda seeks to double the current levels of agricultural productivity and reduce post-harvest losses and waste by at least half to end hunger by 2025 (AU, 2014).

At the regional level, the Southern African Development Community’s (SADC) Food Security and Nutrition Strategy (FNSS) supports the Comprehensive African Agriculture Development Programme (CAADP) commitments (SADC, 2014). The strategy seeks to address food security and nutrition issues from a multi-sectoral perspective. The 2015-2025 FNSS provides an implementation for the food security and nutrition aspects of the 2013 Regional Agricultural Policy (RAP) and the 2015 Regional Health Policy (SADC, 2014:2). The objectives of the 2015-2025 Food Security and Nutrition Strategy include promotion of food availability through improved production and competitiveness, improvement in access to adequate and appropriate quality and quantity food, improvement in the consumption of nutritious, healthy, diverse and safe food and improvement in the stability and sustainability in availability, access and food (SADC, 2014).

2.7. Food security policies in Malawi

Food insecurity and malnutrition remain significant challenges for Malawi. Although there is slow progress in addressing food security and nutrition-related challenges in Malawi, there is

a need to acknowledge the current efforts being undertaken to achieve food security and nutrition for all. Over the years, several policies and strategies have been developed to provide a platform for addressing food insecurity and malnutrition in Malawi. A detailed description of the policies and strategies aimed at addressing food security and nutrition in Malawi are presented in Table 2.2. Despite highlighting the importance of achieving food security for all in Malawi, food security and nutrition policies and strategies do not emphasise on urban food security, which is very critical considering the growing urban populations.

In general, agricultural and nutrition policies in Malawi partly address food security as they tend to focus more on the availability dimension of food security neglecting other equally important elements such as accessibility and stability (Aberman *et al.*, 2018). Although the nutrition policies relate to utilisation component of food security, they do not clearly demonstrate the linkages between nutrition and other sectors such as health (Aberman *et al.*, 2018). While most policies seem to, directly and indirectly, address food security, one thing that is common to all the policies and strategies is the glaring absence of urban food security.

Table 2.2: Summary of Agriculture, Food Security and Nutrition-related policies and strategies in Malawi

Document	Reference period	Responsible MDA	Brief Description
Malawi Growth and Development Strategy (MGDS III)	2017-2022	Ministry of Economic Planning and Development	The MGDS is a medium-term development strategy for Malawi that seeks to reduce poverty through sustainable economic growth and infrastructure development. The strategy has six thematic areas and nine key performance areas (KPA) among which agriculture and food security is one. Through the first KPA, the MGDS seeks to improve agriculture productivity, promote diversification and improve and food security. Among the strategies of achieving food security include minimising post-harvest losses, promoting dietary diversity and expanding national food storage capacity
National Agriculture Policy (NAP)	2016	Ministry of Agriculture, Irrigation and Water Development	The NAP aims at promoting food security through increased production of diversified food crops to foster better nutrition. It attempts to resolve the existing imbalances between food production and nutrition outcomes. The policy further proposes the adoption of a concerted and multipronged approach that increases both production and consumption of diversified food especially among the nutrition vulnerable groups such as the elderly, pregnant and lactating mothers and the chronically ill.
National Agriculture Investment Plan (NAIP)	2018-2023	Ministry of Agriculture, Irrigation and Water Development	The Malawi NAIP is medium-term strategic implementation framework of the 2016 National Agriculture Policy. It aims to address several challenges facing the agricultural sector in Malawi and to attain the agricultural goals spelled out in the third Malawi Growth and Development Strategy (MGDS III) and the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods.

Document	Reference period	Responsible MDA	Brief Description
			Despite focusing on public investment in agriculture, the NAIP acknowledges the significance of private sector investments in achieving agricultural growth. The Malawi NAIP has four programmatic areas (<i>policies, institutions and coordination; Resilient livelihoods and agricultural systems; production and productivity and Markets, value chain, trade and finance</i>) and 16 associated interventions areas including food security and nutrition (IA4). The fourth intervention area seeks to improve nutrition through the promotion of consumption of diversified diets. Three immediate outcomes are identified under the IA4 including improved implementation and coordination nutrition-related activities; linking smallholder farmers to food purchase for institutional feeding programs, and increased availability of nutrition education nationally
National Irrigation Policy (NIP)	2016	Ministry of Agriculture, Irrigation and Water Development	The NIP seeks to promote inclusive economic growth through increasing both agriculture production and production of nutritious food crops. It places irrigation at the heart of the development of the country and recognises the need to reduce over-dependence on rainfall. Among its priority outcomes, the policy aims at improving food security through increasing food availability and incomes at both household and national levels.
National Multisectoral Nutrition Policy	2017-2021		The NMNP was developed to guide the implementation of nutrition response in Malawi. It aims to promote better nutrition in order to have a well-nourished population that can significantly contribute to the country's development. The policy seeks to harmonise nutrition-related interventions from different sectors and among various stakeholders like

Document	Reference period	Responsible MDA	Brief Description
(NMNP)			the government, civil society and the private sector. The policy identifies a total of eight priority areas including prevention of undernutrition, promotion of gender equality, prevention of overnutrition and non-communicable diseases (NCDs), emergency related nutrition, monitoring and evaluation for nutrition, social mobilisation and creation of an enabling nutrition environment.

2.8. The urbanisation context in Malawi

Although the rate of urbanisation is not as high as in the other countries in the Southern Africa Development Community, Malawi continues to urbanise (AU, 2016). The United Nations Human Settlement Programme (UN-Habitat) reported in 2016 that Malawi is still in its early stages of urbanisation with a moderate rate of urbanisation. The proportion of people living in urban areas in Malawi grew from 15.2 percent in 2007 to 16.7 percent in 2017 (NSO, 2018). It is projected that by 2030, a quarter Malawi's population will be living in urban areas (World Bank, 2018) (see Figure 2.1). Three-quarters of Malawians living in urban areas are concentrated in the four major cities of Blantyre, Lilongwe, Mzuzu and Zomba, half of whom live in Lilongwe (Chilanga and Riley, 2017; Manda, 2013). Some researchers have identified rural to urban migration as a significant driver of urbanisation in Malawi (Manda, 2013; Luka, 2016).

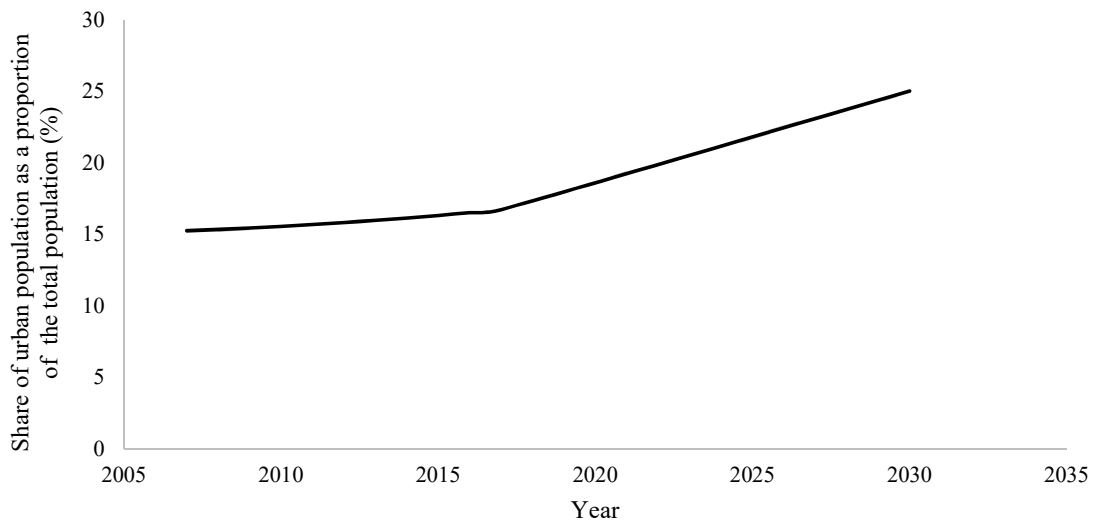


Figure 2.1: Proportion of urban population in Malawi (World Bank, 2018)

Rapid population growth and urbanisation in Malawi have brought more challenges than opportunities to urban areas, especially in the major cities (Riley *et al.*, 2018). Among other challenges, urbanisation has led to a dramatic increase in urban poverty, unemployment and the number of informal settlements (NSO, 2015). Urbanisation has further strained other resources essential for food security such as land, water, sanitation, and health facilities (Manda, 2013).

The proportion of poor people in Malawi is still higher in rural areas (60 percent) compared to urban areas (Figure 2.2). However, recent statistics from the National Statistics Office of Malawi have shown that urban poverty is growing at a rate twice as fast as that of the rural areas (NSO, 2018). While there is a decline in the proportion of poor people in urban areas in Malawi from 25 percent to 18 percent between 2004 and 2016, rural poverty headcount increased from 57 percent to 60 percent within the same period (Figure 2.2).

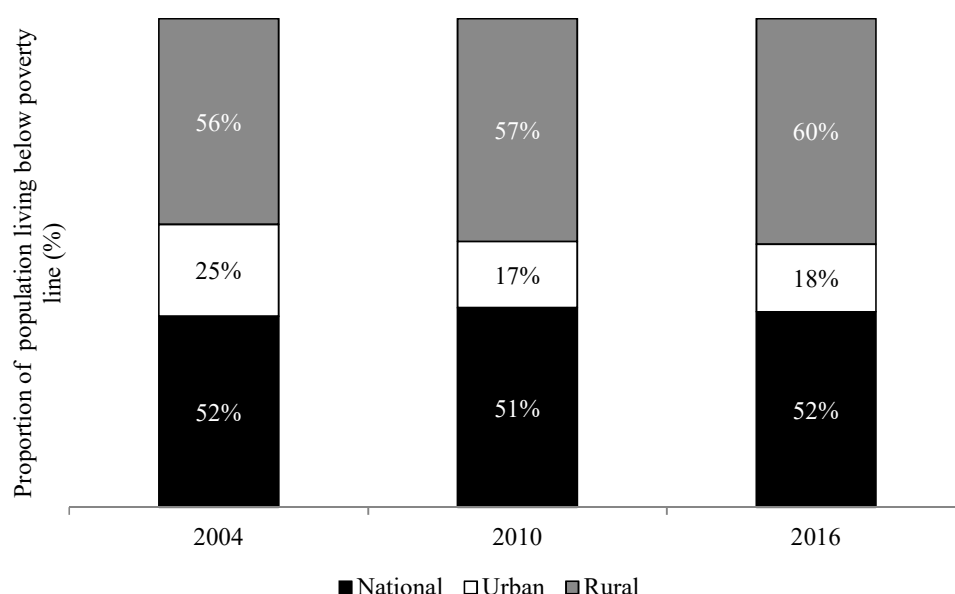


Figure 2.2: Poverty prevalence in Malawi (NSO, 2017)

The number of slums in urban Malawi rose by 30 percent between 2000 and 2015 (UN-Habitat, 2016). There are over 150 informal settlements in the four main urban centres in Malawi (Chilanga and Riley, 2017; Manda, 2013). The residents of these informal settlements are prone to diseases and disasters, which makes them vulnerable to poverty and food insecurity (GoM, 2014).

2.9. Food security and nutrition context in Malawi

Malawi's economy is predominantly agricultural. The primary causes of food insecurity in Malawi are poor agricultural planning and practices, combined with erratic weather and

environmental degradation (WFP, 2018). The environmental degradation is partly attributed to rapid population growth, which places strain on the natural resources (UNDP, 2016).

Malawi has made slow progress in reducing the prevalence of undernourishment (UN, 2018). Although the number of undernourished people has increased, the proportion of undernourished people declined from 27.1 percent in 2000 to 17.7 percent in 2015 (FAO, 2016) (see Figure 3.1). Although undernourishment was the lowest recorded in 2015, the prevalence of undernourishment in Malawi increased slightly to 18.1 percent between 2017 and 2018 (FAO, 2019). The rise in the proportion of undernourished people in the past two years can be attributed to successive shocks such as recurrent dry spells and floods as well as a fall armyworm infestation (FEWS NET, 2019). As a result, the production of various agricultural commodities has fallen (GoM, 2019).

Two rounds of the Food Insecurity Experience Scale (FIES) conducted by the Food and Agriculture Organisation in 2014 and 2016 showed a drop in the prevalence of severe food insecurity from 53.9 percent in 2014 to 51.7 percent in 2016 (FAO, 2017). The 2016 figure is still one of the highest in sub-Saharan Africa; surpassing the regional average (31 percent).

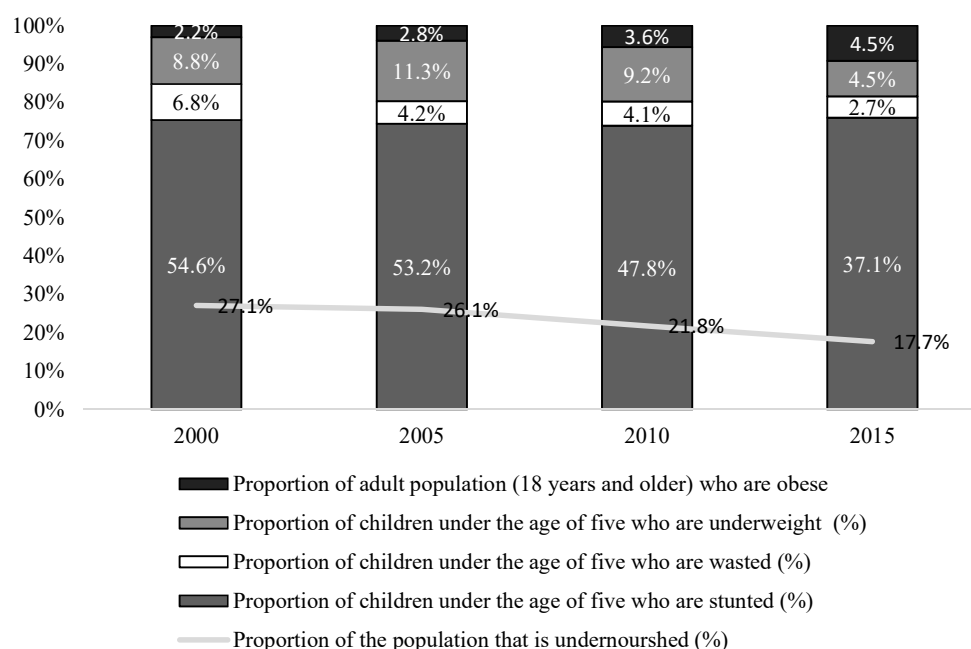
Despite some progress in recent years, child undernutrition remains a developmental and public health challenge in Malawi (USAID, 2018). At the turn of the 21st century, more than half of children under the age of five years were stunted (NSO, 2015). By 2015, the prevalence of child stunting in Malawi was at 37 percent (Figure 3.1). The improvements can be partly attributed to the intensification of nutrition-sensitive programs by both government non-governmental organisations. Child stunting is more prevalent in rural areas (39 percent) than urban areas (25 percent) (NSO and ICF, 2015). Similarly, the proportion of under-five children who are underweight is marginally lower in urban areas (7.8 percent) (see Table 2.3).

In the last two decades, the prevalence of wasting (among children under the age of five) has fluctuated. In 2000, 6.8 percent of children under five years of age were wasted. This proportion reached an all-time low in 2009, where only 1.8 percent of children under the age of five were wasted (NSO, 2017). By 2015, the prevalence of wasting among children under the age of was at 2.7 percent (Figure 2.3). The overall decline of wasting in Malawi can be attributed to interventions such as the Scaling-Up Nutrition (SUN) programme, a global movement that unites national leaders, civil society, bilateral and multilateral organizations, donors, businesses and researchers in a collective effort to improve nutrition (USAID, 2018).

Table 2.3: Rural-urban comparisons of child undernutrition in Malawi

Form of undernutrition	Urban	Rural	Source
Stunting	25.0%	39.0%	NSO, 2015
Wasting	2.6%	3.3%	NSO, 2015
Underweight	7.8%	8.8%	NSO, 2015

Childhood overweight and obesity are some of the serious public health challenges of the 21st century, especially in urban settings (WHO, 2018). Obese children are likely to stay obese into adulthood and more likely to develop noncommunicable diseases such as diabetes at a younger age (WHO, 2018; Simmonds, 2016). In Malawi, there has been a general decline in overweight among children under the age of five years from 8.8 percent in 2000 to 5.1 percent in 2015 (NSO, 2015). The prevalence of adult obesity has increased from 2.2 percent to 4.5 percent (Figure 2.3). One fifth of women between 15 and 49 years of age are either overweight or obese (NSO, 2015). As in many developing countries, the rise in overweight and obesity in Malawi is more pronounced in urban than rural areas (NSO, 2015).

**Figure 2.3: Prevalence of undernutrition and undernourishment in Malawi (World Bank, 2018)**

In Malawi, the proportion of the population accessing basic drinking water rose from 51.6 percent in 2000 to 67.2 percent in 2015 (GoM, 2016). Between 2000 and 2015, the proportion of population accessing basic sanitation facilities increased from 35.5 percent to 43.5 percent (Figure 2.4). Access to proper sanitation remains a challenge for the majority of the population (GoM, 2016).

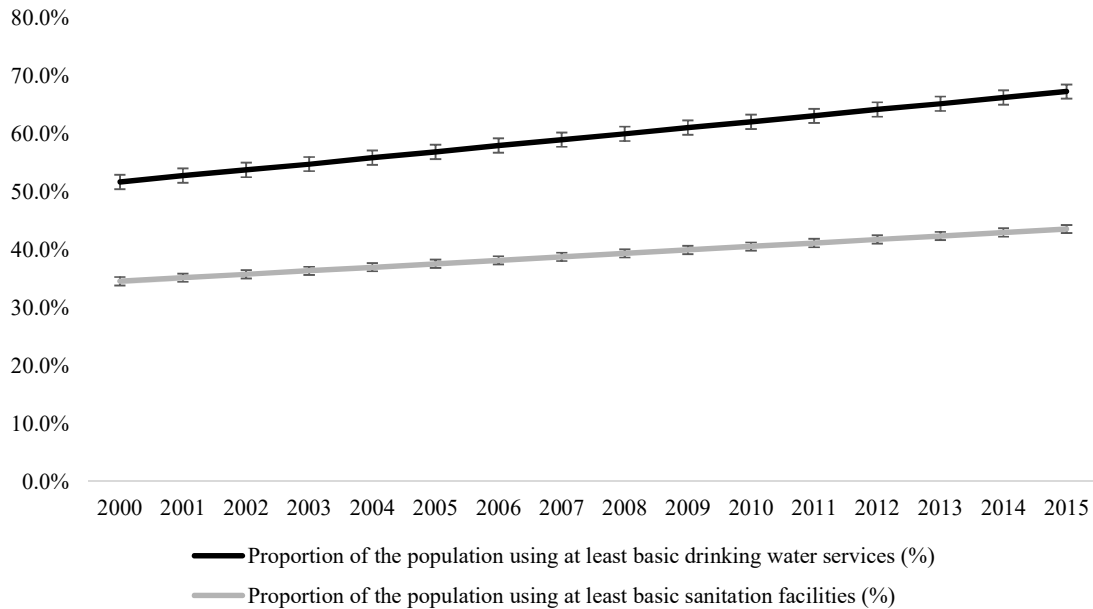


Figure 2.4: Proportion of population accessing basic drinking water and sanitation services in Malawi (World Bank, 2018)

2.10. Food insecurity in urban Malawi

To date, only three urban food security studies have been conducted in Malawi (Mvula et al., 2013; Chilanga *et al.*, 2017; Riley *et al.*, 2018). All three studies were commissioned by the African Urban Food Security Network (AFSUN) and adopted the same methodology focused on income and livelihoods (see Table 2.4).

Table 2.4: A summary of urban food security studies in Malawi

Case Study (year)	Sample size	Methods	Summary findings
Blantyre (2013), Mvula and Chiweza	432 Households from one suburb in Blantyre (Lunzu)	Household Dietary Diversity Score (HDDS) Household Food Insecurity Access Scale (HFIAS) Household Food Insecurity Access Prevalence (HFIAP) Months of Adequate Household Food Provisioning	<ul style="list-style-type: none"> • Over half of the sampled households were food insecure. On average, households consumed six out of twelve food groups. • Sixty-one percent of the households had moderate to low dietary diversity. Cereals were the most consumed food group by most households (98%). • On average, households had enough food for three-quarters of the years.
Lilongwe (2017) Chilanga et al	300 Households from six densely populated neighbourhoods in Lilongwe (Areas 18, 23, 24,25,50 and Airwing)	Household Dietary Diversity Score (HDDS) Household Food Insecurity Access Scale (HFIAS) Household Food Insecurity Access Prevalence (HFIAP) Months of Adequate Household Food Provisioning	<ul style="list-style-type: none"> • Seventy-two percent of the households were severely food insecure. • On average, households consumed five out of twelve food groups. Cereals were the most consumed food group (97%) and meat and other meat products was the least consumed food group (22%). • On average, households had enough food for eight months a year, just under ten percent of the households had enough food for the whole year.

Case Study (year)	Sample size	Methods	<ul style="list-style-type: none"> Summary findings
Mzuzu (2018) Riley et al	910 households from areas around Mzuzu city	Household Dietary Diversity Score (HDDS) Household Food Insecurity Access Scale (HFIAS) Household Food Insecurity Access Prevalence (HFIAP) Months of Adequate Household Food Provisioning	<ul style="list-style-type: none"> Nine in 20 households (45%) were severely food insecure. On average, households consumed half of the twelve food groups, On average, households had enough food for 11 months a year, just over half of households had enough food throughout the year. About 58 percent of the households had difficulties in accessing food during the month of January.

2.11. Synopsis

This chapter has argued that rapid urbanisation poses serious threats to urban food security through compromising the four dimensions of food security. Urban food insecurity in developing countries is mostly regarded as a problem of food access, especially among poor households, considering that most urban dwellers are net food buyers. Although urban areas offer a wide range of employment opportunities for many, most poor urbanites are engaged in informal employment, making it hard for them to cope with low purchasing power. The nature of urban food environment leaves the most urban poor vulnerable to food price shocks, given that most depend on unreliable livelihood sources. Rapid urbanisation also contributes challenges for the urban poor in informal settlements with regard to access to adequate clean water, sanitation and hygiene facilities, putting them at risk of malnutrition. There is an urgency to address urban food security, given the rapid urban population growth in most African cities.

CHAPTER 3:

STUDY CONTEXT AND METHODOLOGY

3.1. Description of the study areas

The study analysed the 2016/17 Malawi Integrated Household Survey data to determine and compare levels and severity of food insecurity and identify groups the most vulnerable people to food insecurity in Blantyre, Lilongwe, Zomba and Mzuzu (Figure 3.1). Blantyre is the commercial and industrial capital of Malawi located in the southern region. Lilongwe is the capital of Malawi located in the plains of the central region. Zomba and Mzuzu are the secondary cities of Malawi situated in the northern and eastern region respectively as shown in figure 3.1.



Figure 3.1: Map of Malawi indicating the four study areas (NSO, 2015)

Table 3.1 provides a socio-demographic comparison of the four study areas. Lilongwe is the largest urban centre in terms of both area and population (NSO, 2018). One in seventeen Malawians lives in Lilongwe (NSO, 2018). Blantyre is the second-largest city followed by Mzuzu and Zomba (NSO, 2018). However, the population density is higher in Blantyre than in other cities (NSO, 2018). The annual population growth rates of Lilongwe and Mzuzu are similar (NSO, 2018). Manda (2013) projected that Mzuzu and Lilongwe will continue to experience more rapid urbanisation over the 20 to 50 years, more so than Blantyre and Mzuzu.

Lilongwe has the highest proportion of people living in informal or unplanned areas (75 percent) followed by Blantyre, Zomba and Mzuzu (NSO, 2018). These informal settlements are usually characterised by poorly constructed infrastructure and limited urban basic services such as quality houses and improved water and sanitation facilities (GoM, 2014). Only one in five people in Zomba have access to piped water (Manda, 2013).

Table 3.1: Socio-demographic characteristics of the study areas

Characteristics	Districts				
	Blantyre	Lilongwe	Mzuzu	Zomba	Data source
Area (km ²)	240	403	146	42	NSO (2018)
Population	800,264	989,318	221,272	138,013	NSO (2018)
Population growth rate (%)	3.6	4.0	4.0	3.4	NSO (2018)
Proportion of males (%)	50.8	51	50	52	NSO (2018)
Population density (persons per Km ²)	3334.433	2454.883	1515.5	3286	NSO (2018)
Proportion of population in informal settlement	70	75	60	66	UN-Habitat (2013)

Over half of the labour force in Blantyre work in formal employment, making it the primary livelihood source (NSO, 2015). On the contrary, a majority of the labour force (70 percent) in Lilongwe relies on the informal sector (NSO, 2015). Chilanga *et al.* (2017) found that about

40 percent of people working in the informal sector in Lilongwe engage in micro and small and medium enterprises (MSMEs). According to the United Nations Settlement Programme (UN-Habitat (2013)), a substantial proportion of the population (70 percent) depend on the timber industry as a source of livelihood in Mzuzu.

In terms of unemployment, Lilongwe has the highest proportion of unemployed people (16 percent) than the other cities (NSO, 2015). The unemployment rates of the other cities are about half of Lilongwe's (NSO, 2015) (see Figure 3.2).

About a third of people live below the poverty line (\$1.90 per day) in Mzuzu, making it the most impoverished urban centre followed by Zomba, Lilongwe and Blantyre (24 percent) (Figure 3.2). Kita (2017) attributed the growing poverty and inequality in Mzuzu to high rates of rural to urban migration.

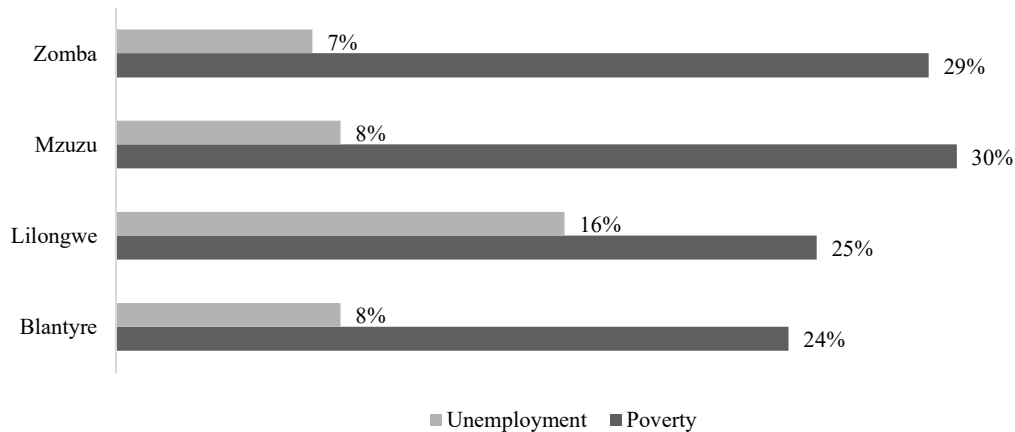


Figure 3.2: Prevalence of poverty (<\$1.25/day) and unemployment in four urban centres in Malawi (NSO, 2015)

3.2. Food security context of the study areas

In terms of food security, there is sparse data on how the four main urban centres in Malawi compare. The only available data that can be used to compare the four study areas is from the 2012 World Food Programme's comprehensive food security and vulnerability analysis (CFSVA), (Table 3.2).

On average, all four cities exceed the minimum daily food energy requirement for Malawi (2100 Kcal) (WFP, 2012). Blantyre had the highest daily food energy consumption per

capita (2779 Kcal) followed by Mzuzu (2641 Kcal) and Zomba cities (2413 Kcal). The results for Blantyre were slightly higher than both the national average and the urban average daily food energy consumption per capita. Lilongwe city had the lowest mean daily food energy consumption per capita (2226 Kcal). Almost 40 percent of the people in Lilongwe fail to meet the daily minimum energy requirement (2100 Kcal). Mzuzu had the lowest proportion of food energy deficient people probably due to the fact it has the highest proportion of farmers engaging in food production.

A majority of Malawians (73 percent) derive most of their food energy from staples and this is attributed to overreliance on maize (IFPRI, 2017. Aberman *et al.* (2015) noted that an average Malawian consumes about 130 kilograms of thick maize porridge in a year which is locally referred to as “*nsima*”. Out of the four urban centres, Lilongwe had the highest proportion of people with a very high share of energy from staples (like cereals and grains) (27 percent), followed by Mzuzu, Blantyre and Zomba. The findings imply that diets for most households in Malawi lack other essential nutrients such as proteins (WFP, 2012).

Lilongwe had the highest proportion of households (11.9 percent) with low dietary diversity implying that they ate fewer than five food groups of the seven groups (FANTA, 2006). The proportion for Lilongwe was lower than the national proportion with low dietary diversity and slightly higher than the urban proportion. Nationally, a quarter of households in Malawi were classified as having inadequate food consumption in 2012 WFP’s CFSVA, meaning that they consume limited nutritious and less diversified food required for an active and healthy life (WFP, 2015).

The highest proportion of the population with inadequate food consumption was from Mzuzu (11.2 percent) followed by Zomba, Lilongwe and Blantyre. Blantyre had the highest average FCS score (FCS 66.7), which was higher than the national average FCS of 48. The findings mean that to a larger extent, households from all the cities had acceptable diets (WFP, 2015).

Blantyre reported the highest average reduced Coping Strategies Index (rCSI 3.8) followed by Mzuzu, Zomba and Lilongwe. The higher the rCSI means that households used more coping strategies when they were faced with food shortage (Maxwell *et al.*, 2013). The average rCSI for Blantyre was higher compared to the country average of rCSI 3.4. The findings suggest that households in Blantyre used detrimental coping strategies than other

Table 3.2: A comparison of various food security indicators in Malawi from 2011/2012 IHS data

Diet quantity			Diet quality					Vulnerability			
	Daily food energy consumption per capita	Population with food energy deficiency	food energy from staples	Households with a very high share of energy from staples	Households with poor food consumption	Households with borderline consumption	Households with inadequate Consumption	Food Consumption Score	Dietary diversity	Households with low dietary diversity	rCSI
	(mean kcal)	%	%	%	%	%	%	mean	Mean (0-7)	%	mean
Malawi	2129	46.8	73.9	53.2	3.5	22.2	25.8	48	5.1	29.2	3.4
Urban	2497	34.4	65.2	25.9	0.4	6.4	6.9	61.8	6	7.9	3.5
Rural	2063	49	75.5	58.2	4.1	25.2	29.3	45.5	4.9	33.1	3.6
Blantyre	2779	31.2	64.3	24.7	0.3	4.5	4.5	66.7	6.1	4.4	3.8
Lilongwe	2226	39.4	66.5	27.1	0.5	7.3	7.8	58.5	5.8	11.9	1.4
Mzuzu	2641	25.9	64.6	27	3.1	8.1	11.2	56.8	5.9	10.1	1.7
Zomba	2413	38.1	63.1	22.7	0.5	8.1	8.6	62.1	6.1	6.2	1.6

Source: WFP, 2012

The study set out to investigate the levels and severity of food insecurity and identify the most vulnerable groups in Blantyre, Lilongwe, Mzuzu and Zomba in Malawi. Methods applied in the study are discussed in this chapter.

3.3. Data sources and sampling

The study used secondary data from the National Statistical Office of Malawi in its fourth Integrated Household Surveys (IHS4) of 2016/17. Integrated Household Surveys (IHS) are conducted every five years, collecting nationally representative data to assist the Malawian government in monitoring various aspects of the welfare of population (NSO, 2016). The IHS data assist in monitoring the progress of achieving the Sustainable Development Goals (SDGs) and targets set out in the Malawi Growth and Development Strategy (MGDS). The surveys are implemented with the help of the World Bank as part of the Living Standards Measurement Surveys (LSMS) (NSO, 2016).

The Integrated Household Survey used a stratified two-stage sampling technique (NSO, 2016). The first stage involved the selection of the Primary Sampling Units (PSUs), referred to as census Enumeration Areas (EAs) - as defined in the 2008 Population and Housing Census (PHC). The EAs were selected from two strata of urban and rural areas. Households were then selected with a probability proportional to the size of each EA. The second stage involved a systematic random selection of households from EAs identified in the first stage. The four major urban centres include Blantyre, Lilongwe, Mzuzu and Zomba. A total sample of the urban stratum in the IHS 4 data was 1728 households. Of this sample, Lilongwe had the highest proportion (33.4 percent), Blantyre, Mzuzu and Zomba had 22 percent apiece.

3.4. Data treatment and analysis

Data were cleaned and checked for inconsistencies before analysis. Descriptive statistics analyses including means, frequencies, cross-tabulations, standard deviations were used to describe various aspects of sampled households including Demographic characteristics; sources of income; livelihood sources and food insecurity coping strategies. The Microsoft Excel 2016, Stata 15 and SPSS statistical software were used in the analysis to construct

various food security indicators. One-way analysis of variance was used in the study to compare the differences in the mean values of food security indicators. T-test was used to determine if they were statistically significant differences in the means of continuous socio-demographic variable between male and female-headed households. The Chi-square tests were applied to test relationships between various categories of food security indicators. Bivariate proportional tests were also applied to determine the differences in the proportions food insecure households.

There is a consensus among researchers that measuring food insecurity is complex and that to date, no single agreed measure of food insecurity exists (Hendriks, 2013a; Headey and Ecker, 2013). As a result, there is always a trade-off in the choice of food insecurity metrics to be used as there is no measure that captures all the four dimensions of food security, food availability, food accessibility, food utilisation and stability (Maxwell *et al.*, 2014). The following food security indicators included in the survey were used to address the first two study objectives: The Household Dietary Diversity (HDDS), the Food Consumption Score (FCS), the reduced Coping Strategies Index (rCSI), the Months of Adequate Household Food Provisioning (MAHFP), the share of expenditure on food and an asset indicator. Table 3.3 provides a description of each food security indicator. These indicators were calculated from the raw Integrated Household Survey (IHS) data in accordance with the literature (FANTA, 2006; WFP, 2008; WFP, 2015; Africare, 2007; Maxwell *et al.*, 2014; Browne *et al.*, 2014). Estimation details of food security indicators are discussed in the sections below:

The Household Dietary Diversity Score (HDDS) captures various food groups consumed by the household within a designated period, usually 24 hours (FANTA, 2006). It captures the quality of food but not quantity accessed by a household a day prior to being interviewed (Leroy *et al.*, 2015). In 2006, the International Food Policy Research Institute (IFPRI) reported significant correlations between the HDDS and caloric measures. Due to its strong association with household calorie access and socioeconomic status, the HDDS is considered a good indicator of food access (Hoddinot and Yohannes, 2002; Kennedy *et al.*, 2010; Aberman *et al.*, 2018) The sensitivity of the HDDS to changes in food access makes it useful in program impact evaluation (Jones *et al.*, 2013).

The IHS questionnaire asked households to report on the number of food groups that they consumed during the previous week. A seven-day recall period was considered in this study.

The following food groups were considered in the calculation of the HDDS: fish; meat; eggs; fats and oils; staples including cereals and grains; vegetables; fruits; daily products; roots and tubers; condiments; sugar and pulses. Following the methodology of FAO (2006), the scores were grouped into three categories: lowest dietary diversity ($HDDS \leq 3$); medium dietary diversity ($HDDS 4$ and 5) and high dietary diversity ($HDDS \geq 6$).

Table 3.3: Description of the variables used in the analysis

Variable	Brief Description
Months of Adequate Household Food Provisioning (MAHFP)	A proxy of food access measuring number of months a household has enough food in a year
Food Consumption Score (FCS)	measures household consumption of different food groups which are weighted according to their nutrition value
Household Dietary Diversity Score (HDDS)	A nutrition quality indicator capturing different food groups consumed by a household within a designated period
reduced Coping Strategies Index (rCSI)	An indicator that measures the level of household coping capacity to food shortages
Per Capita Expenditure(PCEXP)	A proxy for the level of household income measured as a quotient of monthly household expenditure and the total number of household members
Asset ownership	An indicator that measures the level of household resilience or stability of food calculated by a simple summation of household assets

The IHS questionnaire asked households to report on the number of food groups that they consumed during the previous week. A seven-day recall period was considered in this study. The following food groups were considered in the calculation of the HDDS: fish; meat; eggs; fats and oils; staples including cereals and grains; vegetables; fruits; daily products; roots and tubers; condiments; sugar and pulses. Following the methodology of FAO (2006), the scores were grouped into three categories: lowest dietary diversity ($HDDS \leq 3$); medium dietary diversity ($HDDS 4$ and 5) and high dietary diversity ($HDDS \geq 6$).

The World Food Programme's Food Consumption Score or the FCS is a composite score that measures dietary diversity, food frequency and relative nutrition importance of various food groups (WFP, 2008). Normally, the FCS uses a seven-day recall period (as compared to the HDDS which considers either 24 hours or a week) and considers eight weighted food groups as opposed to twelve unweighted groups in the HDDS. The eight food groups used in calculating the FCS are staples; pulses; vegetables; fruits; meat, fish and eggs; fats and oils. Research has shown that the FCS is significantly positively correlated with other food security indicators such as the Household Dietary Diversity Score, assets, the Months of Adequate Household Food Provisioning and expenditure (WFP, 2007; Perez-Escamilla, 2017).

The information on the dietary diversity and frequency of food consumption as reported by the surveyed households was used to compute a food consumption score. The FCS was converted into the following consumption categories: poor consumption (FCS, 0-21); borderline consumption (FCS 21.5-35) and acceptable consumption (FCS greater than 35). According to WFP (2015), if over 90 percent of the sampled households consume sugar and oils on a daily basis, the thresholds must be adjusted as follows: Poor consumption (FCS 0-28); borderline consumption (FCS 28.5-42) and acceptable consumption (FCS greater than 42).

The Food expenditure as a share of total household expenditure measures household economic vulnerability, implying that the more important food is within a household budget relative to non-food items or services, the more economically vulnerable the household is (Maxwell, 2014; WFP, 2015). The indicator is calculated by dividing total monthly food expenditure by total monthly household expenditure (WFP, 2015).

In this study, two steps were involved following the WFP's (2015) methodology for estimating the share of food expenditure in total household expenditure. The first step involved adjusting nominal monthly household expenditures to real expenditure by dividing the nominal monthly expenditure figures by corresponding Consumer Price Indices (CPI) following Deaton and Zaidi's (2002) methodology. The rationale for doing this was to account for temporal (time) differences during data collection. Real monthly food expenditures were divided by the real total monthly expenditure. The ratios were then converted to percentages (shares). The food expenditure share indicator was converted into a

four-point scale: food secure (score of 1) if the share was higher than 50%; marginally food secure (2) if the share was between 50-65%; moderately food insecure (3) if the share was between 65-75% and severely food insecure (4) if the share was higher than 75% (WFP, 2015).

The Months of Adequate Household Food Provisioning (MAHFP) is an indicator of both availability and access dimensions of food security at the household level (Africare, 2007; Bilinsky and Swindale, 2010; FANTA, 2003). The indicator captures the number of months in a year that the households reported having enough food. The number of months households reported not having enough food was subtracted from 12 months to derive the MAHFP. The score was classified into three categories following the Africare (2007) methodology. The categories are presented in Table 3.4.

The reduced Coping Strategies Index (rCSI) is a variant of the Coping Strategies Index (CSI) (Maxwell and Caldwell, 2008). The rCSI is a proxy indicator of household food insecurity, measuring the frequency and severity of food consumption behaviours used by households when faced with food shortages (WFP, 2015). Unlike the CSI, the rCSI measures least severe coping strategies (Maxwell *et al.*, 2013). The coping strategies considered in the rCSI include: reducing the number of daily meals; consuming less preferred or cheaper foods; limiting portion sizes at mealtimes; borrowing food from friends or relatives and restricting consumption by adults so that small children can eat.

Studies have shown that the rCSI is correlated with other food consumption measures like the FCS and the HDDS (Maxwell *et al.*, 2008; Maxwell *et al.*, 2014; Perez-Escamilla *et al.*, 2017). The rCSI has the ability to determine whether food security is improving or worsening thereby making it a good indicator of household vulnerability to shocks (Maxwell *et al.*, 2013). One advantage of the rCSI is its wider applicability to different contexts which allows for regional or community comparison (Maxwell *et al.*, 2008). Calculation of the rCSI involved multiplying the frequency of the use of coping strategies and their respective severity weights as defined by Maxwell and Caldwell (2008). Following Maxwell *et al.*'s (2014) methodology, four groups were generated from the rCSI. The groups are presented in Table 3.4.

Asset ownership is an indirect measure of food security as it reflects the household's ability to cope and withstand food shortages (Hjelm *et al.*, 2016). In other words, the level of assets a household has determines its resilience to food insecurity. Studies suggest that households

with fewer assets are more vulnerable to food insecurity (Gebre, 2012; Maxwell, 1998; Chambers, 2006). In this study, we used a simple asset count derived from the summation of assets owned by the household. The following three categories were generated according to Browne *et al.* (2014): more resilient households (higher asset ownership); moderately resilient households and least resilient (low asset ownership) (Table 3.4)

Table 3.4: Classification of food security indicators

Indicators	Category number	Category description	Range	Source
FCS	1	Acceptable	>42	WFP, 2008
	2	Borderline	28.5-42	
	3	Poor	0- 28	
HDDS	1	Adequate dietary diversity	>6	FANTA, 2006
	2	Moderate dietary diversity	4-5	
	3	Inadequate dietary	≤ 3	
Food expenditure share	1	Low	>50%	WFP, 2015
	2	Medium	50% - 65%	
	3	High	65% - 75%	
	4	Very high	≥75%	
MAHFP	1	Least food insecure	≥10	Africare, 2007
	2	Moderately food insecure	6 - 10	
	3	Most food insecure	3 - 6	
rCSI	1	Food Secure	0- 3	Maxwell <i>et al.</i> , 2014
	2	Mildly food insecure	4 - 8	
	3	Moderately food insecure	9 - 18	
	4	Severely food insecure	> 18	
ASSET Index	1	Most resilient	≥10	Browne <i>et al.</i> , 2014
	2	Moderately resilient	6 - 10	
	3	Least resilient	3 - 6	

Non-parametric relationships between the food security indicators (FCS, HDDS, rCSI, MAHFP, share of food expenditure and Assets) were determined using spearman's rho correlation.

3.5. Quantitative evaluation techniques

To identify groups of most vulnerable people to food insecurity, the study used spearman's rank-order correlation, a non-parametric test that capture strength and direction of association between variables (usually ordinal or continuous) (Gauthier, 2001). The Spearman's

correlation is applied where the assumption of normality is violated and a non-linear relationship between the two variables exists (Hauke *et al.*, 2011). In this study, the variables of interest (food security indicators and socio-economic characteristics) were either ordinal or continuous in nature, thereby satisfying the first assumption. In addition to scatter plots, the assumption of normality was rejected for the continuous variables after being subjected to Shapiro Wilk test for normality. Scatter plots revealed monotonic relationships between the variables, meaning that either the variables increased in value together or as one variable increases in value, the other one decreased in value. The mathematical representation of Spearman's correlation was as follows:

$$rR = 1 - \frac{6 \sum_{i=1}^n d_i^2}{n^3 - 1}$$

where n is the number of data points of the two variables and d_i is the difference in the ranks of the i th element of each random variable considered. The Spearman correlation coefficient, ρ , can take values from +1 to -1.

- A ρ of +1 indicates a perfect association of ranks
- A ρ of zero indicates no association between ranks and ρ of -1 indicates a perfect negative association of ranks.
- The closer ρ is to zero, the weaker the association between the ranks.

3.6. Validity and reliability of the methods

The concepts of validity and reliability are very crucial in every research. For a study to be valid, the tools used have to be adequate and well-grounded (Mohajan, 2017). If the tools are able to produce results that are consistent, then, the study is said to be reliable (Cafiero *et al.*, 2014). The study is reliable in a way that it uses food security indicators that are well established, have been validated in different contexts and have prescribed guidelines. The procedures used can be replicated to yield results that are consistent.

To ensure the reliability and validity of this research, the following procedures were followed according to Saunders *et al.* (2009). The data were also checked for inconsistencies such as inappropriate units of different variables making sure that there are uniform units of measurement of a particular variable. Following Mohajan's (2017) methodology for dealing

with missing values, missing values in the data were replaced by the mean values. The procedures for computation of indicators were repeated in SPSS and excel after the initial results in Stata software, ensuring that we are getting the same results.

3.7. Study ethics

The study protocol was approved by the Ethics Committee of the Faculty of Agricultural and Natural Sciences at the University of Pretoria (Appendix A). Formal authorization was obtained from the National Statistics Office of Malawi (NSO) to use the 2016/17 Integrated Household Survey (IHS 4) data for the purposes of this study (Appendix B). A memorandum of understanding was signed regarding data usage (Appendix C).

3.8. Assumptions

The first assumption of this study is that the sample was representative enough to make inferences about the urban population. The study also assumed that the respondents were honest in their responses during data collection such that any analysis made reflected the actual situation on the ground. It further assumed that literacy levels did not affect how respondents answered the survey questions. Similarly, it was assumed that enumerators were well trained and followed all the necessary procedures in the data collection process and that they were able to probe for the right answers.

3.9. Limitations of the study

The study used cross-sectional data from the 2016/2017 Integrated Household Survey (IHS). Consequently, the study does not capture food insecurity trends over time. The indicators used in the study were limited those available in the 2017 IHS data set. Assessment of nutrition outcomes is an important aspect of food security analyses. However, the data did not contain nutrition indicators such as anthropometric indicators. As such, the study was restricted to indicators of dietary quality and food access.

CHAPTER 4:

DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF SAMPLED HOUSEHOLDS

This chapter presents the demographic and socio-economic characteristics of the study population. The chapter seeks to provide an overview of the study sample distribution and the interaction of various socio-economic characteristics. Of the 1728 sampled households, Lilongwe had the highest share of households (33.3 percent) while Blantyre, Mzuzu and Zomba cities constituted 22.3 percent apiece.

4.1 Sex and marital status of the household head

Male headed households constituted the largest proportion of as compared to female-headed households (78.2 percent). This was observed in all the study areas. Lilongwe had the highest proportion of male-headed households with 83.5 percent (see Table 5.1). Blantyre had the lowest proportion of male-headed households (74.5 percent). These findings are in line with those of the National Statistics Office (NSO, 2016), which reported that there were more male-headed households (74.8 percent).

Table 4.1 shows that a majority of the household heads were married (72.6 percent). Lilongwe had the highest proportion of married household heads (77.1 percent), while Blantyre had the least proportion (66.9). Mzuzu had a higher proportion of households headed by single persons (9.4 percent) followed by Zomba, Blantyre and Lilongwe. Blantyre had a higher proportion of widow-headed households. A higher proportion of households headed by either divorced or separated individual were from Blantyre

4.2. Age of the household head

Distribution of the sampled population by mean age and household size is shown in Table 5.2. The overall mean age of the household heads was 41 years, ranging from 17 to 91 years.

Table 4.1: Demographic and socio-economic characteristics of the sampled population

Measurements		District				
Variable	Category	Overall Count (%) (n= 1728)	Blantyre (n=384)	Lilongwe (n =576)	Mzuzu (n=384)	Zomba (n=384)
			%	%	%	%
Sex	Male	1351 (78.2)	74.5	83.5	75.8	76.3
	Female	377 (21.8)	25.5	16.5	24.2	23.7
Age	<20	4 (0.2)	0.8	0.2		
	20 – 34	642 (37.2)	35.4	37.5	37.0	38.5
	35 – 49	719 (41.6)	38.8	44.3	41.9	40.1
	50 – 65	273(15.8)	19.0	13.9	18.0	13.3
	>65	90 (5.2)	6.0	4.2	3.1	8.1
Marital status	Single	137(7.9)	8.9	5.6	9.4	9.1
	Married	1254(72.6)	66.9	77.1	72.9	71.1
	Widowed	172(10.0)	14.3	7.3	9.4	10.2
	Divorced/separated	165(9.5)	9.9	10.1	8.4	9.6
Household size	Small (1-4)	999(57.8)	64.1	54.0	57.6	57.6
	Medium (5-8)	683(39.7)	34.4	43.1	39.1	40.6
	Large (>8)	43(2.5)	1.6	3.0	3.4	1.8
Education level of household Head	None	535(31.0)	26.8	36.3	25.0	33.1
	Primary	199(11.5)	11.7	11.3	13.5	9.6
	Secondary	698(40.4)	44.4	38.9	47.5	33.6
	Tertiary	296(17.1)	19.0	13.6	14.1	23.7

Source: Author's analysis of the fourth Integrated Household Survey (NSO, 2017).

Table 4.2 shows that Blantyre had the highest average age of the household head (41.17 years). Most household heads were between 35 and 40 years (41.5 percent). The results of t-test revealed a significant difference between the mean ages of male-headed households and female-headed households ($p < 0.01$) (Table 4.3).

Table 4.2: Distribution of sampled population by mean age and household size

Variable	Mean (standard deviation)				P-Value
	Blantyre (n=384)	Lilongwe (n= 576)	Mzuzu (n= 384)	Zomba (n = 384)	
Age of household head (in years)	41.17(13.50)	40.96(13.89)	39.82(11.96)	40.32(11.83)	0.398
Household size	3.97(1.83)	4.48(2.03)	4.29(2.16)	4.25(1.94)	0.015**

*and ** Indicate 1% and 5% level of significance respectively

Source: Author's analysis of the fourth Integrated Household Survey (NSO, 2017)

4.3. Household size

The mean household size of the surveyed population was three individuals; this is slightly lower than the national average household size of four individuals (NSO, 2016). The mean adult equivalent was 3.6 individuals (Table 4.3). Lilongwe had the highest average household size (4.5 persons), this is slightly higher than the urban average household size reported by NSO (2016). Blantyre had the lowest mean household size of four Individuals. On average, male-headed households had relatively larger household sizes (4.4 persons).

Table 4.3: Proportion distribution of mean household head age and household size by sex

Variable	Male (n=1351)	Female (n=377)	T-test	Overall
	Mean(SD)	Mean(SD)		Mean(SD)
Age of the household head	39.9(±12.17)	42.6(±14.40)	***	40.5(±12.74)
Household size	4.44(±2.00)	3.7(±1.89)	***	4.3(±2.01)
Adult equivalents	3.8(±1.69)	3.1(±1.61)	***	3.6(±1.70)

*** Indicate 1% level of statistical significance

Source: Author's analysis of the fourth Integrated Household Survey (NSO, 2017)

4.4. Education level of the household head

Education plays an important role in household food security in such a way that educated household heads have the potential to access better economic opportunities (Aidoo and Mensah, 2013). The more one is educated, the better their chances of being employed or running a successful income-generating activity, thereby improving their prospects of being food secure. Lower education levels impede access to such economic opportunities in the labour market (IFAD, 2016). A significant proportion of household heads in all the districts had completed secondary school (40.4 percent). Almost one third of the household heads did not have a formal education. A higher proportion of male heads completed secondary (42.8 percent) and tertiary (18 percent) education levels than female heads, meaning that male heads were generally more educated. These differences all significant at one percent level (Table 4.4).

Table 4.4: Relationship between sex and education level of the household head

Sex	N	Educational level				X ² significance
		None	Primary	Secondary	Tertiary	
Female	377	40.1	14.3	32.6	13	
Male	1351	28.4	10.7	42.6	18.3	***

*** Indicate 1% level of statistical significance

Source: Author's analysis of the fourth Integrated Household Survey (NSO, 2017)

4.5. Household income sources

Formal employment was the most prevalent income source, with over half of the households depending on this source (Figure 4.1). This finding supports that of the African Food Security Urban Network (AFSUN, 2016) who found that half of the urban population in southern Africa rely on formal employment as their main source of income. Non-agricultural businesses were the main income source among households in the Lilongwe sample. This was likely as Lilongwe is the business hub and capital city of Malawi (GoM, 2016). Male-headed household relied more on formal employment as their main income source while

females (53.3 percent) households relied more on non-agricultural business than their main income source. The primary income source between male and female-headed households was not statistically significant different between sexes.

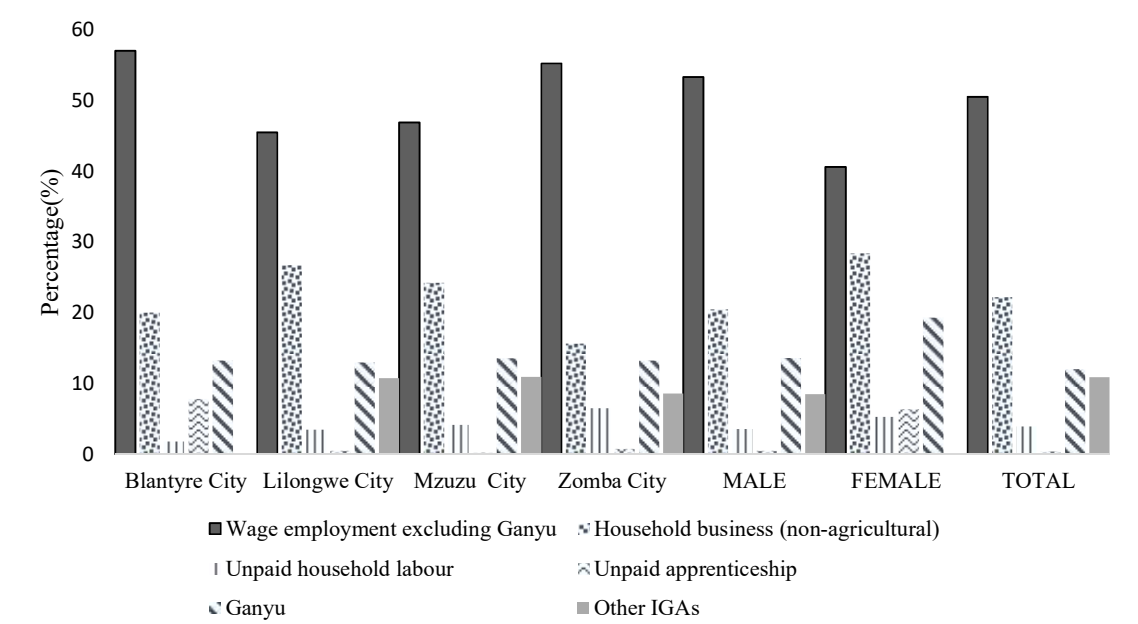


Figure 4.1: Main sources of income by district and sex of the household head (NSO, 2017)

¹ “*Ganyu*”

¹ A term that used to describe off-farm labor, usually piecework

CHAPTER 5:

COMPARATIVE ANALYSIS OF THE LEVELS AND SEVERITY OF FOOD INSECURITY IN THE FOUR CITIES

5.1. Introduction

The first objective of this study was to compare the levels of food insecurity in the four main urban centres in Malawi using the Food Consumption Score, the Household Dietary Diversity Score, food expenditure as a share of total household expenditure, the reduced Coping Strategy Index, the Months of Adequate Household Food Provision and an asset index. The second objective of this study was to establish how severe food insecurity is in four main urban centres and compare these levels across the cities. The findings of these two objectives are presented and discussed in the sections below.

5.2. The Household Dietary Diversity Score (HDDS) results

The household dietary diversity score ranged from three to eleven over the 12 possible food groups, with a mean of nine food groups. About two-thirds of the households had adequate dietary diversity, i.e. they consumed food from more than six food groups the week prior to the survey.

The proportion of households with low dietary diversity (those consuming three food groups or less) was higher for Zomba (2 percent) (Figure 5.1). Mzuzu had the highest proportion of households with adequate dietary diversity followed by Lilongwe, Zomba and Blantyre. The F test showed that there were statistically significant differences in the average values of the HDDS across the four cities at 5 % level of significance (p -value = 0.015).

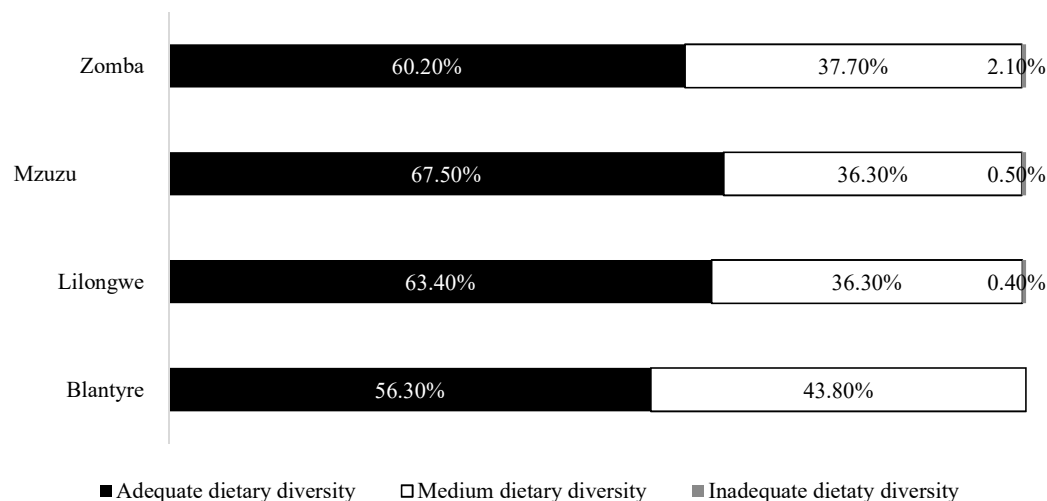


Figure 5.1: Proportion of households in urban Malawi by dietary diversity, N=1728 (Blantyre =384, Lilongwe =576, Zomba =384, Mzuzu =384)

Source: (NSO, 2017).

All households consumed cereals, especially the grains. Over 96 percent of the households in Blantyre and 95 percent in Mzuzu consumed cereals every day. This may be explained by the fact that maize prices are comparatively low in Blantyre, Lilongwe and Zomba as compared to Mzuzu (Auction Holdings Commodity Exchange, 2018). Mzuzu is the largest producer of roots and tubers, which may permit substitution of tubers for grain in the diets of these households.

Other frequently consumed food groups were vegetables, fats and oils, sugars and condiments. On average, 82 percent of the households in Mzuzu consumed vegetables daily, followed by Blantyre (77 percent), Lilongwe (76 percent) and Zomba (73 percent). About four in five households in Blantyre consumed sugar every day.

The least frequently consumed food groups were fruits (79 percent), milk and other dairy products (61 percent) and pulses (76 percent). On average, these foods were consumed about twice a week. The low consumption of pulses can partly be explained by an increase in prices between 2016 and 2018 (averaging 47 percent per annum) (GoM, 2018). Despite milk and other daily products being the least consumed food group, sixty-nine percent of households in Mzuzu consumed milk at least once a week. Forty-four percent of households in Blantyre did not consume milk at all a week prior to the survey. The lower milk consumption can be explained by the fact that dairy products are relatively expensive and that most poor households consider these foods as a luxury (Auction Holdings Commodity Exchange, 2018).

Overall, the results of a chi-square test showed significant differences (at 5 percent level of significance) in the proportions across the four cities. Further, the results from the bivariate analyses of a sub-sample proportional tests which aim at establishing whether there are significant differences between proportions of any two samples showed that the proportion of most food-insecure households were significantly different between Blantyre and Zomba (P-value = 0.0043), Lilongwe and Zomba (P-value = 0.0340) and Mzuzu and Zomba (P-value = 0.0503)).

5.3. The Food Consumption Score (FCS) results

The results of the Food Consumption Score revealed that main staples (including cereals, roots and tubers), vegetables and sugar were the most frequently consumed foods. On average, pulses (such as legumes) were consumed for two days making the least consumed food group of the eight groups considered in the FCS (Table 5.1). The coefficient of variation (CV) for milk and other daily product was the highest among all the food groups (100%) while the CV for staples was the lowest (12%). The results of the CV suggest that there was more variability in the consumption of milk than in the consumption of staples (Maxwell *et al.*, 2013).

Overall, a third of households (30 percent) had inadequate food consumption. They consumed limited and insufficient nutritious food. Of those households with inadequate consumption, 3.2 percent consumed a poor diet and 26.8 percent consumed a borderline diet. The proportion of households with acceptable food consumption was higher in Mzuzu (73 percent) followed by Zomba, Lilongwe and Blantyre (Figure 5.2). Lilongwe had a higher proportion of households with inadequate food consumption (34 percent). The results of one-way analysis of variance showed that there were statistically significant differences between the average values of the FCS among the four study areas at 5% level of significance (p-value = 0.045).

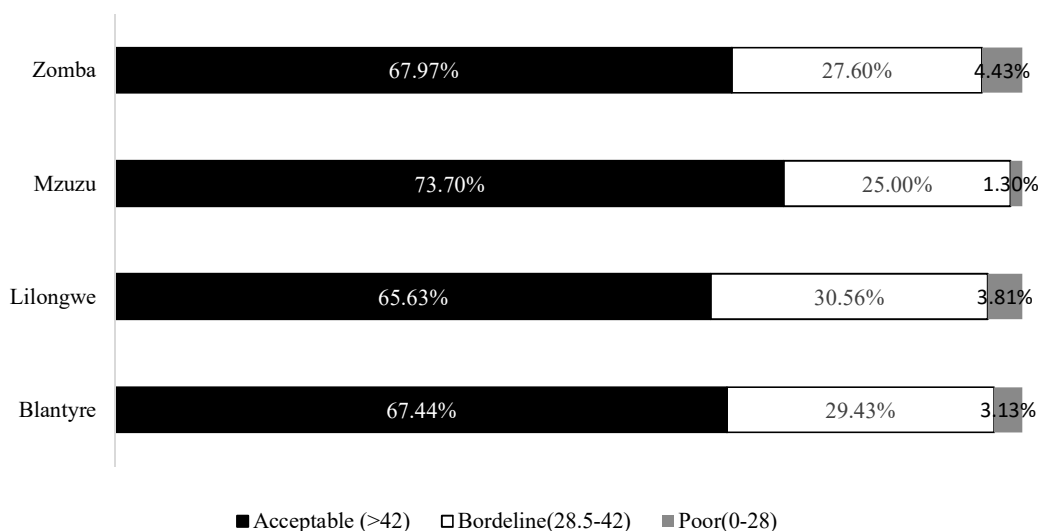


Figure 5.2: Proportion of households by food consumption in urban Malawi, N=1728 (Blantyre =384, Lilongwe =576, Zomba =384, Mzuzu =384)

Source: (NSO, 2017).

The results of the Food Consumption Score were consistent with those of the Household Dietary Diversity score in a way that both suggest Mzuzu had a higher proportion of households with adequate dietary diversity and acceptable food consumption. Again, both indicators point out that Zomba was the worst in terms of dietary quality, with higher proportions of households with inadequate dietary diversity and food consumption.

Figure 5.3 show that a majority of households (94 percent) consumed protein-rich foods such as fish and meat than vitamin A and iron-rich foods which were only consumed by 90 percent and 87 percent of households respectively. Fish is widely available in Malawi and relatively cheap compared to meat (IFPRI, 2017). On average, 15 percent of households in Zomba consumed protein-rich foods daily. This finding can be explained by the fact that Zomba is closer to Lake Malombe, which makes fish more affordable due to high supply.

Statistically significant differences (at 5 percent level of statistical significance) in the proportions of households consuming poor diets were observed across the four city samples based on the chi-square test results. However, statistically significant differences in the proportion of households consuming poor diets as determined by a bivariate proportional test of sub-samples were noted between Blantyre and Mzuzu (at 10 percent level of significance), Lilongwe and Mzuzu (at 5 percent level of significance) and Zomba and Mzuzu.

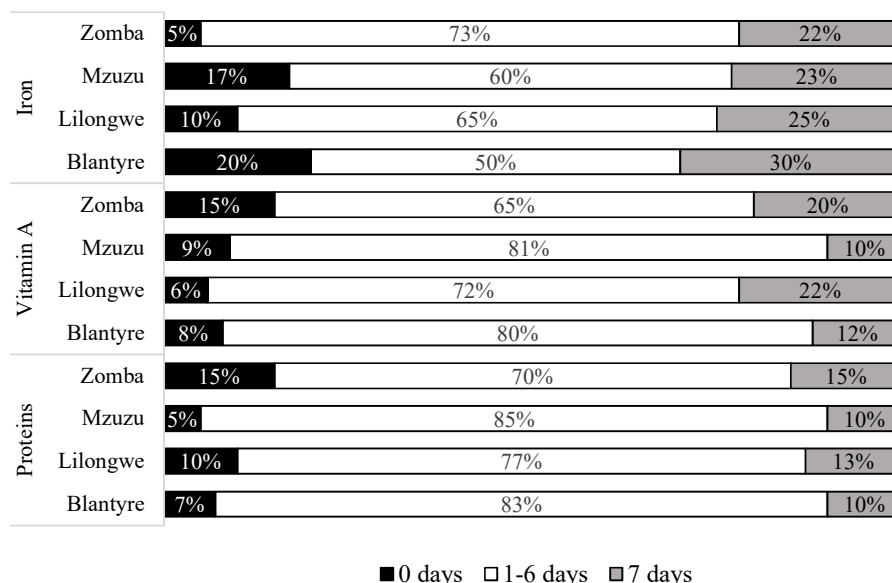


Figure 5.3: Proportion of households consuming proteins, vitamin A and iron-rich foods by district, N=1728 (Blantyre =384, Lilongwe =576, Zomba =384, Mzuzu =384)

Source: (NSO, 2017).

Statistically significant differences (at 5 percent level of statistical significance) in the proportions of households consuming poor diets were observed across the four city samples based on the chi-square test results. However, statistically significant differences in the proportion of households consuming poor diets as determined by a bivariate proportional test of sub-samples were noted between Blantyre and Mzuzu (at 10 percent level of significance), Lilongwe and Mzuzu (at 5 percent level of significance) and Zomba and Mzuzu (at 5 percent level of significance).

More households (22 percent) in Lilongwe consumed vitamin A-rich foods such as dark green vegetables, orange fruits and orange vegetables on a daily basis (Figure 5.3). Three in ten households in Blantyre consumed iron-rich foods (such as organ meat, fish and eggs) daily. This was higher than in the other cities (Figure 5.3). Households in Blantyre have relatively higher per capita incomes, which may allow households to consume such foods more regularly (Manda, 2013).

Table 5.1: Summary findings of food groups consumed in the study areas

Food group	Coefficient of variation	Blantyre n=384				Lilongwe n=586				Mzuzu n=384				Zomba n=384			
		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max				
Main staples	0.13	6.89±0.62	1	7	6.84±0.75	1	7	6.53±1.24	1	7	6.77±0.87	1	7				
Pulses	0.73	2.11±1.73	0	7	2.40±1.69	0	7	2.39±1.55	0	7	2.64±1.69	0	7				
Vegetables	0.21	6.27±1.42	2	7	6.35±1.36	0	7	6.47±1.29	0	7	6.27±1.42	1	7				
Fruits	0.83	2.30±2.25	0	7	2.71±2.18	0	7	2.89±2.38	0	7	3.34±2.40	0	7				
Meat and fish	0.50	3.88±1.94	0	7	3.86±1.88	0	7	4.31±2.11	0	7	4.21±2.16	0	7				
Milk and other dairy products	1.00	2.93±2.98	0	7	2.92±2.94	0	7	3.16±2.83	0	7	2.93±3.03	0	7				
Fats and oils	0.26	6.50±1.40	0	7	6.25±1.75	0	7	6.51±1.34	0	7	5.97±1.87	0	7				
Sugar	0.29	6.42±1.67	0	7	6.32±1.79	0	7	6.21±1.89	0	7	6.02±1.96	0	7				
Condiments	0.12	6.89±0.58	2	7	6.79±0.94	0	7	6.89±0.66	0	7	6.81±0.87	1	7				

“Mean” in the table represents the average number of days (out of 7) a particular food group is consumed.

Source: Authors computation from the Malawi’s fourth Integrated Household Survey (NSO, 2017).

5.4. The reduced Coping Strategies Index (rCSI) results

Overall, about two in five households were found to be food insecure (including mildly, moderately and severely food insecure categories) (Figure 5.4). Zomba had the highest (rCSI 10.93) and Zomba the lowest average reduced Coping Strategies Index (rCSI 5.31). The one-way analysis of variance results showed that there were statistically significant differences in the means of rCSI across the four areas (at 5% level of significance with an associated p-value of 0.013).

The most commonly adopted coping mechanism was relying on less preferred or cheaper food. Zomba had a higher proportion of food-insecure households (about two-thirds) followed by Mzuzu, Lilongwe and Blantyre (Figure 5.4). Zomba also had the highest proportions of households using each of the five coping strategies (relying on less preferred or cheaper food, borrowing from a friend or relative, reducing the number of daily meals, limiting meal portion sizes and restricting consumption by adults) (see Table 5.2). The coefficient of variation showed greater variability in using the individual coping strategies across the four samples, with the highest variability observed for Zomba in the strategy of restricting consumption by adults so that children can eat (2.99). The findings for Zomba could be explained by the finding the district was severely affected by disasters such as recent floods and drought, leading to significantly low agriculture production (GoM, 2018). As a result, food prices for most foods were high, making them unaffordable by poor urban households.

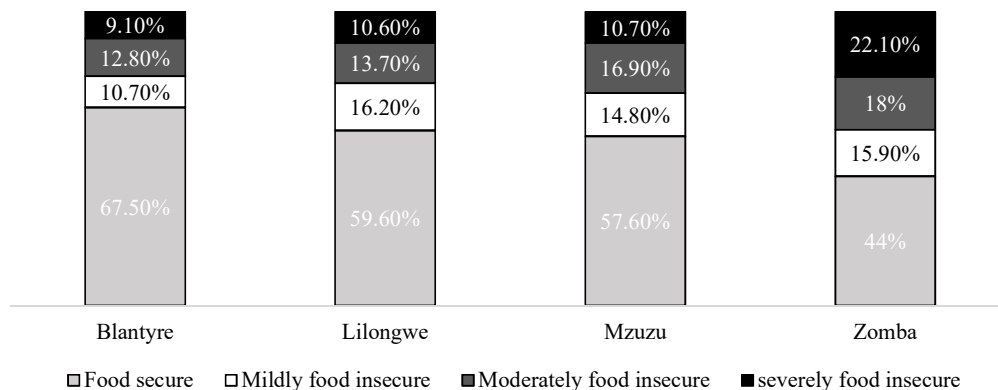


Figure 5.4: Proportion of households by food security categories from rCSI by district, N=1728 (Blantyre =384, Lilongwe =576, Zomba =384, Mzuzu =384)

Source: (NSO, 2017).

In relation to the sex of the household heads, the analysis of the rCSI revealed on average, female-headed had higher rCSI scores as they applied comparatively more coping strategies than male-headed households. T-test results showed that the rCSI scores of male-headed households were statistically significantly different from those of female-headed households at 1% level of statistical significance. These findings mean that female-headed households were more food insecure. Such higher levels of food insecurity in female-headed households could be explained by lower monthly per capita incomes (Mk18, 378) and relatively a bigger family sizes with a higher number of dependents (an average of five members and an average of one income earner) (NSO, 2017).

Table 5:2: Proportion of food coping strategies by district

Food Insecurity coping strategy	N	Blantyre (n=384)	Lilongwe (n=576)	Mzuzu (n=384)	Zomba (n=384)	P-value
		%	%	%	%	
Rely on less preferred food	738	29.7	39.9	48.2	54.4	0.000***
Borrow from a friend or relative	268	14.3	15.3	11.5	21.1	0.023**
Reduce the number of meals eaten in a day	459	18.2	25.0	25.3	38.5	0.000***
Limit portion size of meals	541	23.2	28.5	31.5	43.5	0.000***
Restrict consumption by adults	249	10.4	13.9	11.2	22.4	0.000***

*** and ** denotes levels of statistical significance at 1% and 5% respectively.

5.5. The Months of Adequate Household Food Provisioning (MAHFP) results

Lilongwe had a relatively higher proportion of households (45 percent) that were more food insecure followed by Mzuzu, Zomba and Blantyre (Figure 5.5). Mzuzu had a higher proportion of least food insecure households.

Three in five households had enough food for at least ten months a year preceding the survey. The average number of months of adequate household food provisioning varied from 7.53 (for Lilongwe) to 9.63 (for Blantyre). The interquartile range for Mzuzu and Lilongwe were relatively more dispersed than for Blantyre and Zomba. The results of one-way analysis of variance revealed statistically significant differences in the average number of months of adequate food provisioning across the four study areas at 1% level of statistical significance (p -value = 0.001). This means that households in some districts had enough food for more months than in other districts. Households in Blantyre had more months with adequate food (10) followed by Zomba (9), Mzuzu (8) and Lilongwe (7). This could be explained by the finding that Blantyre had a higher proportion of households deriving their livelihoods from formal employment which is more stable.

Three-quarters of households that did not have enough food all year round reported December, January and February as the most difficult months to access food. These findings suggest that food access was a more seasonal problem, with the months with more hunger coinciding with the agricultural lean season in the rural farming communities as such, food prices are also higher. This finding suggests that urbanites rely heavily on rural food produce. Consequently, seven in ten households reported price fluctuations within the year and lack of cash as the main reasons for difficulties in accessing enough food.

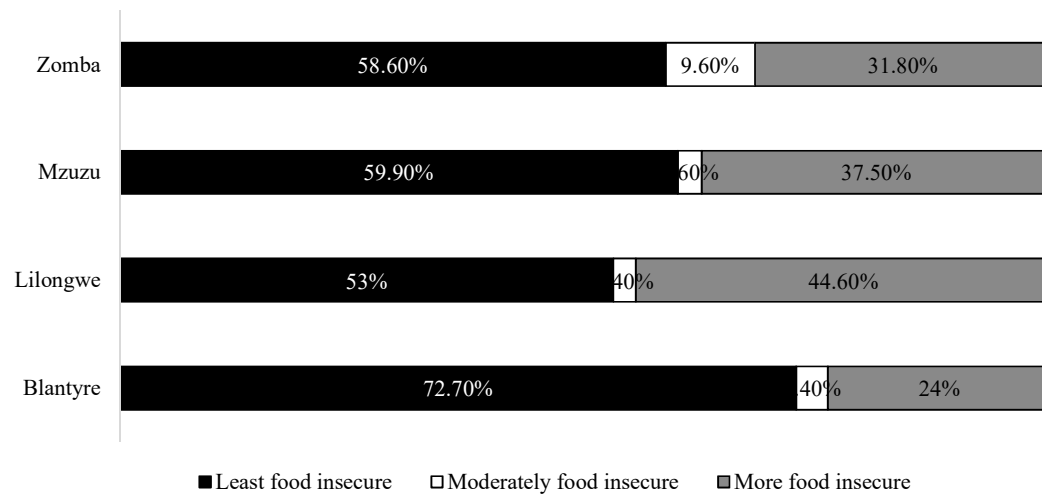


Figure 5.5: Proportion of households by food security categories from the MAHFP by district, N=1728 (Blantyre =384, Lilongwe =576, Zomba =384, Mzuzu =384)

Source: (NSO, 2017).

The results of a chi-square test showed statistically significant differences in the proportions of the most food-insecure households (at 5 percent level of significance) across all the case studies where households in Blantyre and Mzuzu reported having enough food for more months than in Lilongwe and Zomba. The bivariate proportional tests showed significant differences in proportions of the most food-insecure households between Blantyre and Lilongwe (P-value = 0.0000), Blantyre and Mzuzu (P-value = 0.0001), Blantyre and Zomba (P-value = 0.0160), Lilongwe and Mzuzu (P-value = 0.0445), Lilongwe and Zomba (P-value = 0.0001) and Mzuzu and Zomba (P-value = 0.0470). However, these findings were inconsistent with the HDDS and the FCS considering that the two dietary quality measures classified Zomba as the most food-insecure unlike the MAHFP.

5.6. Food expenditure as a share of total household expenditure

Forty-two percent of households in Lilongwe allocated at least 65 percent of their budget to food, which was relatively higher compared to Blantyre (38 percent), Zomba (35 percent) and Mzuzu (26 percent). On average, households in Blantyre spent relatively more on food followed by Lilongwe, Zomba and Mzuzu (Figure 5.6). As indicated earlier, average incomes in Blantyre are reportedly higher than in the other cities.

The chi-square test results showed that the proportions of most severe food insecure people were statistically significantly different across the city samples (at 1 percent level of significance, with an associated p-value = 0.0002). Food expenditure shares were very high in Blantyre and Lilongwe.

The results of one-way analysis of variance showed that there were statistically significant differences in the average monthly per capita food expenditures among the four urban centres (at the 5% level of significance and with a p-value of 0.002). Chilanga *et al.* (2017) and Mvula and Chiweza (2013) found that food prices are relatively higher in Blantyre and Lilongwe than Zomba and Mzuzu.

On average, households had per capita food expenditure of MK 9, 982 (about 58 percent of the total per capita expenditure) every month, with the lowest monthly per capita spending, ranging from MK365 to about MK90,000. One in ten households allocated more than 75 percent of their budget to food. The majority of households with food expenditures exceeding 75 percent of their income were also classified as the poorest. This is in line with the finding that poor households tend to have higher food expenditures (WFP, 2015).

Upon closer inspection on the food commodities that households bought, it was observed that about 40 percent of the food budget was spent on cereals. This finding concurs with those of the FCS and the HDDS which showed that cereals were the most consumed food commodity across the four case studies.

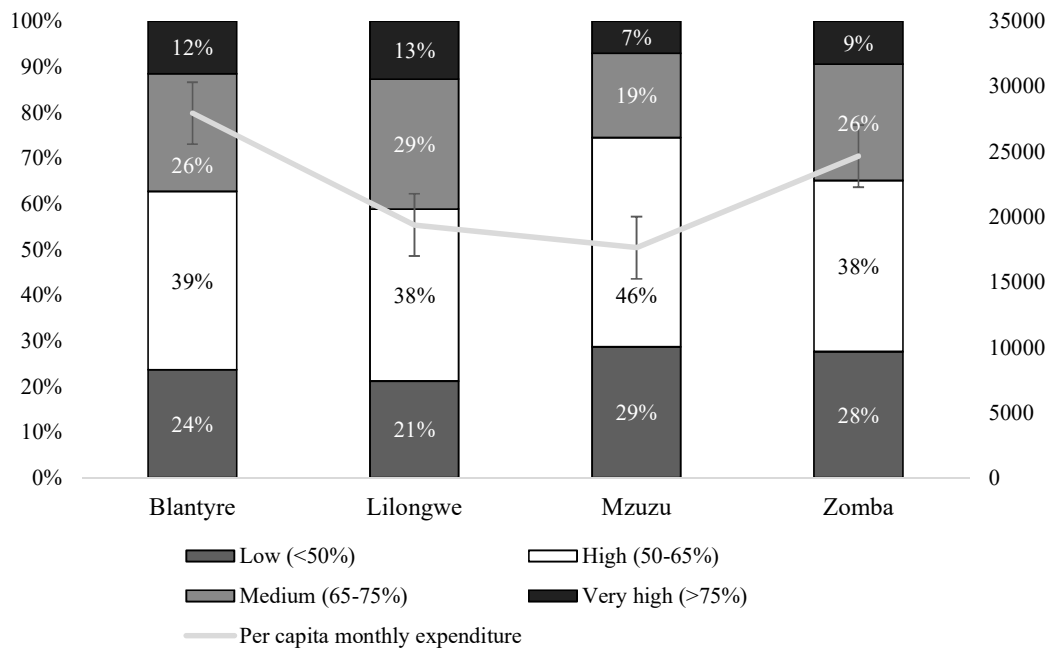


Figure 5.6: Proportion of households by share of food expenditure and mean per capita monthly expenditure, N=1728 (Blantyre =384, Lilongwe =576, Zomba =384, Mzuzu =384)

Source: (NSO, 2017).

Generally, the chi-square test results showed that the proportions of most severe food insecure people based on the food expenditure as a share of total food expenditure were statistically significantly different across the city samples (at 1 percent level of significance, with an associated p-value = 0.0002). Food expenditure shares were very high in Blantyre and Lilongwe. However, the results of bivariate sub-sample proportional test specifically showed statistically significant differences in the proportions of Blantyre and Mzuzu (P-value = 0.0428), Lilongwe and Mzuzu (P-value = 0.0030) and Lilongwe and Zomba (P-value = 0.0454).

5.7. Asset index results

Household asset ownership is a proxy indicator for resilience, meaning that the more assets a household has, the higher its ability to bounce back quickly from shocks (Browne *et al.*, 2014). Zomba was found to be more food secure based on asset ownership, with slightly over a third of the households owning at least ten categories of assets. The proportion of the least food insecure households was higher in Lilongwe, with over half of the households owning five or fewer assets out of the ten classes of assets (Figure 5.7). These findings are consistent with the findings of the months of adequate household food provisioning and the food expenditure as a share of total expenditure. All three indicators suggest that there were relatively higher levels of food insecurity in Lilongwe.

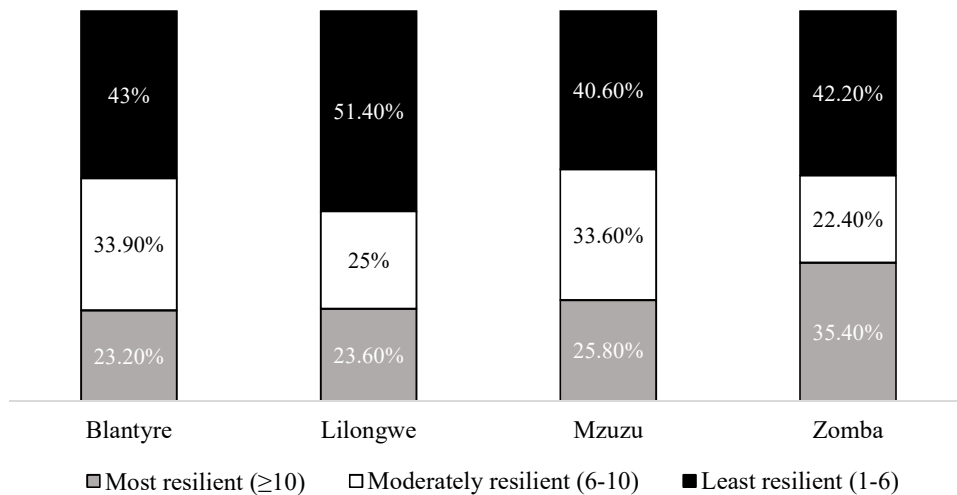


Figure 5.7: Proportion of households by asset categories in urban Malawi, N=1728 (Blantyre =384, Lilongwe =576, Zomba =384, Mzuzu =384)

Source: (NSO, 2017).

Two in five households owned fewer than five assets. The most commonly owned assets were beds (79 percent), irons (52 percent) and chairs (50 percent). On average, households owned seven out of the 28 possible asset classes. The results of the coefficient of variation showed more variability in asset ownership classes among households in Lilongwe (78 percent) (see Table 5.3). The results of the one-way analysis of variance also showed that there were statistically significant differences in the average number of assets owned among the four urban centres at 5% level of significance ($p\text{-value} = 0.001$). Households in Zomba and Blantyre owned more assets than households in Mzuzu and Lilongwe. This finding could

be explained by the finding that households in Zomba and Blantyre engaged in more income generating activities which allow them to invest in more assets.

Table 5:3: A summary of asset ownership by district

District	N	Coefficient of variation	Mean	Min	Max	F stat
Blantyre	384	0.66	7.54	0	22	7.20***
Lilongwe	576	0.78	6.67	0	28	
Mzuzu	384	0.62	7.04	0	21	
Zomba	384	0.73	8.20	0	27	

P=Sig (2-tailed) results

***Significant at P<0.01 level (2-tailed)

The findings from the asset ownership index, which measures the ability of a household to cope with food security shocks, showed that Lilongwe had a higher proportion of most severely food insecure people. Overall, significant differences were observed in the proportions of least resilient households across the four case studies (at 5 percent level of significance) as determined by the chi-square test. In terms of the actual differences based on the bivariate sub-sample proportional test, statistically significant differences were observed between Blantyre and Lilongwe (P-value = 0.0096), Mzuzu and Lilongwe (P-value = 0.0010) and Zomba and Lilongwe (P-value = 0.0050). These findings were consistent with the MAHFP findings in that both indicators identified Lilongwe as the most food insecure. Low asset ownership in Lilongwe could be explained by the finding that Lilongwe has a higher proportion of poor people who mostly prioritise their current consumption as opposed to cumulating assets (NSO, 2016).

5.8. Food insecurity anxiety

The first sign of household food insecurity is worrying about its future food supplies (Maxwell *et al.*, 1999). About half of the sampled households were worried about being food insecure in the future. This is a clear indication that in the event of a sudden shock; households would easily slip into food insecurity. Figure 5.8 shows that about half of the

households in Lilongwe were worried about future food insecurity. Thirty-seven percent of households in Blantyre were worried about food insecurity.

Female-headed households were more anxious about future food insecurity (50 percent). The chi-square showed that there were statistically significant associations with regards to food insecurity anxiety (at the 5% level of statistical significance, $p\text{-value} = 0.037$). This finding may be explained by the finding that male-headed households had more diversified livelihood opportunities (an average of three livelihood sources) as opposed to two sources in female-headed households, such that if one fails they could easily switch to the other.

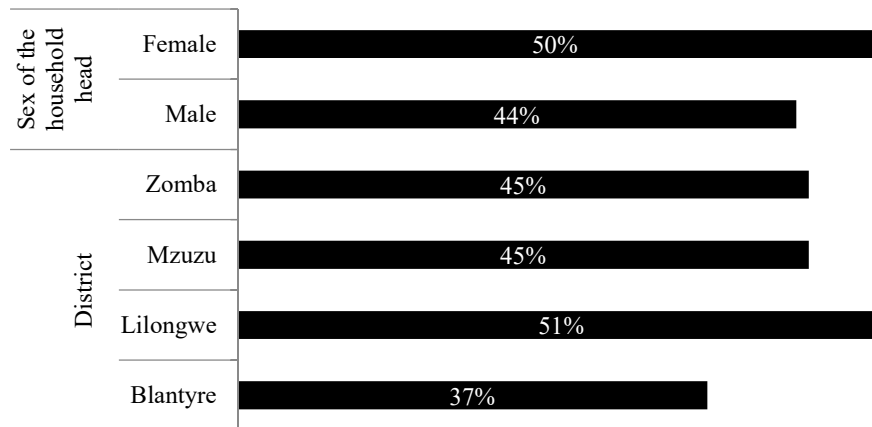


Figure 5.8: Proportion of households that worried about food shortages in urban Malawi, N=1728 (Blantyre =384, Lilongwe =576, Zomba =384, Mzuzu =384)

Source: (NSO, 2017).

5.9. A comparison of food security indicators

A summary of spearman's rho correlation of the six food security indicators (HDDS, FCS, RCSI, MAHFP, SHARE and ASSET) using a complete sample of 1728 households is presented in Table 5.4. All the measures but HDDS and share were in the expected direction and significant at 1% level of statistical significance.

Table 5:4: Spearman's Rho correlation for food security indicators (N=1728)

	HDDS	FCS	RCSI	MAHFP	ASSET	SHARE
HDDS ¹	1.0000					
FCS ²	0.6360*	1.0000				
rCSI ³	-0.3148*	-0.4104*	1.0000			
MAHFP ⁴	0.1820*	0.2826*	-0.4517*	1.0000		
ASSET ⁵	0.4577*	0.5078*	-0.3860*	0.3436*	1.0000	
SHARE ⁶	0.0034	-0.0732*	0.0905*	-0.1122*	-0.2704*	1.0000

*indicate level of statistical significance at 1%.¹Food Consumption Score, ²Household Dietary Diversity Score, ³Reduced Coping Strategy Index, ⁴Months of Adequate Household Food Provisioning, ⁵ Food Expenditure Share, ⁶Total number of assets owned by a household.

The dietary quality indicators (the HDDS and the FCS) had a strong, positive and significant correlation with each other because the more food groups a household consumed the more likely it consumed more nutritious foods. As expected, ASSET had a positive and significant correlation with MAHFP and FCS. This meant that the more assets a household owned the more food secure it was, based on the higher MAHFP and FCS scores.

The rCSI had a significant negative correlation with HDDS, FCS, MAHFP and asset ownership. According to Table 5.4, this can be interpreted as meaning that the higher the household score for HDDS, FCS, MAHFP and ASSET, the more food secure a households was and the lower the need for the household to adopt food coping strategies. Likewise, the food expenditure share had a negative and significant correlation with the FCS, MAHFP and ASSET indicators. The higher the food expenditure share, the poorer the households were and the less the food secure state as shown by the lower household scores for FCS, MAHFP and ASSET.

5.10. Synopsis of the levels of insecurity in the four cities

The first objective of this study was to compare the levels of food insecurity in the four main urban centres in Malawi using the Food Consumption Score, the Household Dietary Diversity Score, food expenditure as a share of total household expenditure, the reduced Coping Strategy Index, the Months of Adequate Household Food Provision and an asset index. Table 5.5 provides a summary of food security indicators used in this study. Overall results showed that Lilongwe was the most food insecure city followed by Zomba, Blantyre and Mzuzu.

5.11. A comparison of the levels of food insecurity in the four cities

The second objective of this study was to establish how severe food insecurity is in four main urban centres of Blantyre, Lilongwe, Mzuzu and Zomba in Malawi and compare the levels of severity in the cities.

The Household Dietary Diversity Score (HDDS) was a proxy measure for the quality of food consumed by households. Based on the results of the HDDS, food insecurity was most severe in Zomba given a higher proportion of households consuming inadequate diets (Table 5.5). However, Zomba was identified as the most food-insecure city among the four case studies based on the results of the Food Consumption Score (FCS). This was in line with the findings of the HDDS. The prices for most food commodities are much higher in Zomba due to the long distances from the areas of production, which in turn affects food affordability by most households (Aberman, 2015).

A significantly lower proportion of most food-insecure households was found in Mzuzu, making this city the least severely food insecure. Mzuzu had a higher proportion of educated household heads, who may have been exposed to more nutrition information and so had better diets.

Table 5.5: Summary of food security outcomes for Malawi, 2017

Indicators	Category number	Category description	Range	Blantyre (n=384)	Lilongwe (n=586)	Mzuzu (n=384)	Zomba (n=384)
Household Dietary Diversity Score (HDDS)	1	Inadequate dietary diversity	≤3	0	0.4	0.5	2.1
	2	Moderate dietary diversity	4-5	43.8	36.3	32.3	37.7
	3	Adequate dietary diversity	>6	56.3	63.4	67.5	60.2
Food Consumption Score (FCS)	1	Poor	0-28	3.2	3.9	1.3	4.5
	2	Borderline	28.5-42	29.4	30.5	25	27.6
	3	Acceptable	>42	67.4	65.6	73.7	67.9
Food expenditure share	1	Very high	≥75%	11	13	7	9
	2	High	65%-75%	39	28	46	38
	3	Medium	50%-65%	26	29	19	26
	4	Low	<50%	24	21	29	28
Months of Adequate Household Food Provisioning (MAHFP)	1	Most food insecure	3-6	24	44.6	37.5	31.8
	2	Moderately food insecure	6-10	3.3	2.4	2.6	9.6
	3	Least food insecure	≥10	72.7	53	59.9	58.6
reduced Coping Strategies Index (rCSI)	1	Severely food insecure	>18	9.1	10.5	10.7	22.1
	2	Moderately food insecure	9-18	12.8	13.7	16.9	18
	3	Mildly food insecure	4-8	10.6	16.2	14.8	15.9
	4	Food secure	0-3	67.5	59.6	57.6	44
Asset Index	1	Least resilient	3-6	42.9	51.4	40.6	42.2
	2	Moderately resilient	6-10	33.9	25	33.6	22.4
	3	Most resilient	≥10	23.2	23.6	25.8	35.4

The months of adequate household food provisioning captured the household's ability to access food. Lilongwe had a higher proportion of most food-insecure households, who barely had enough food most times of the year. The share of food expenditure in total household expenditure is an indicator of food security as poor households spend a significantly higher share of their income on food. Lilongwe also had the highest proportion of most severely food insecure people (those with food expenditure shares higher than 75 percent). In addition, Lilongwe also had the highest proportion of households in the lowest income quintile (poorest). These findings were consistent with the MAHFP but inconsistent with the HDDS and the FCS.

The reduced Coping Strategies Index (rCSI) measures the food coping mechanisms that households adopt when faced with food shortages. The findings of the rCSI revealed that Zomba had the highest proportion of severely food insecure people. However, Lilongwe had a higher proportion of most severely food insecure people based on the asset ownership index.

Based on the findings of the HDDS, the FCS and the rCSI, Zomba was classified as the most food-insecure city. Households in Zomba experienced more difficulties in accessing quality diets, which is not surprising considering the city's higher food prices. Consequently, most food-insecure households are forced to apply strategies that help in soothing their food consumption thereby compromising the nutrition status of household members.

The results of the MAHFP, asset ownership and share of food expenditure in total household expenditure, showed Lilongwe as the most food insecure city. These findings could be explained by high poverty prevalence in the city. Lilongwe experiences rapid urban population growth, averaging five percent growth annually in the past decade (2008-2018) which is more than the average annual urban population growths of Zomba (3 percent), Blantyre (2.8 percent) and Mzuzu (2.5 percent) (NSO, 2018; UN-Habitat, 2019). However, the population growth does not commensurate with its ability to properly manage the ever-growing population, pushing more people into poverty.

Based on these findings, the hypothesis that there were no statistically significant differences in the severity of food insecurity across the cities was rejected.

CHAPTER 6:

IDENTIFICATION OF THE MOST VULNERABLE GROUPS

The final objective of this study was to identify groups most vulnerable to food insecurity in the four main urban centres of Malawi. Table 6.1 presents results of Spearman's rank correlation of six food security indicators and household socio-economic characteristics of the 1728 urban households in Blantyre, Lilongwe, Mzuzu and Zomba, Malawi.

There were negative and significant correlation between household size and MAHFP, asset ownership and HDDS. While a positive and significant correlation was observed between rCSI and household size. These findings mean that the larger the household, the less likely it is to be food secure. Most large households also had a relatively higher number of dependents, implying that fewer workers supported a larger number of people. As a result, such households may have prioritised current consumption at the expense of investing in durable assets thereby exposing themselves to future shocks.

Education of the household head had a positive and significant correlation with FCS, HDDS and ASSET (all significant at 1 percent level of statistical significance). However, negative and significant correlations were observed between education level of the household head and rCSI, SHARE and MAHFP. These findings imply that households with less educated heads were more likely to be food insecure. A possible explanation for this finding could be that most uneducated households were not frequently involved in formal employment and very profitable income generating activities. This is further supported by the fact that education generally increases the likelihood of getting better job opportunities and managing a successful business which in turn allow households to not only accumulate savings but also to have long term investments.

The socio-economic status (SES) of the household head had positive and significant correlations with HDDS, FCS and asset ownership (all significant at the one percent level of significance). On the contrary, SES had an expected negative and significant correlation with rCSI, food expenditure share and MAHFP. Poorer household would more likely be food insecure and headed by people with lower education levels, making it harder for them to engage in reliable income generating activities.

Table 6.1: Spearman's Rank correlation coefficients of socio-economic characteristics and the likelihood of being most food insecure

	FCS	MAHFP	SHARE	rCSI	Asset	HDDS
Household size	-0.034	-0.069***	-0.017	0.098***	-	-
					0.199***	0.121***
Education level	0.141***	-0.274***	-	-	410***	0.291***
			0.136***	0.201***		
Social Economic	-	-0.319***	-	-	-	0.074***
Status	0.178***		0.102***	0.293***	0.409***	
Sex of head	-0.022	-0.011	0.029	0.061	0.059**	0.323***
Age of the household head	0.063	0.042	-0.031	-0.043	0.247	-0.013
Marital Status	-0.071	0.054	-0.177	-0.093	0.049	-0.151
Livelihood options	0.374**	0.235**	-0.461**	-0.152	0.197**	0.299**
Credit	0.178**	0.260**	-0.051	-0.435**	0.063**	0.063**

** and *** indicate level of statistical significance at 5% and 1% respectively.

¹Food Consumption Score, ²Household Dietary Diversity Score, ³Reduced Coping Strategy Index, ⁴Months of Adequate Household Food Provisioning, ⁵ Food Expenditure Share, ⁶Total number of assets owned by a household.

The results in Table 6.1 further revealed positive and significant correlations between sex of the household head and asset ownership and HDDS. These findings mean that male-headed households were more likely to be food insecure than female-headed households. This finding contradicts those of the World Food Programme (WFP, 2012) who found that female-headed households were the more vulnerable. The findings of this study could be explained by the relatively higher education levels among urban female heads, which could improve their prospects of securing better livelihood opportunities. The job opportunities for educated females may have been enhanced women's empowerment campaigns such as the 50-50 initiative being championed by the Malawi Ministry of Gender, Children and Social Welfare in collaboration with the UN Women (GoM, 2019).

Number of livelihood activities per household was positively negatively and significantly correlated with HDDS, ASSET and FCS at 5 percent level of significance. A positive and significant correlation was observed between number of livelihood activities a household was involved in and rCSI, MAHFP and food expenditure share. The results can be supported by the finding that households with at least two livelihood options had higher per capita incomes. This implied that households with fewer livelihood options were more likely to be food insecure. Livelihood diversification may increase incomes and has a positive influence on food consumption as shown by Tumaini (2016) and Semali *et al.* (2011).

Access to credit, which defined in this study as the ability of the household finances either through both formal and non-formal financial institutions, was statistically and significant correlated with FCS, MAHFP, ASSET, rCSI and HDDS at five percent level of statistical significance. Households without access to credit were more likely to be food insecure. Access to credit can lead to investment in various businesses. This is further supported by the finding that three-quarters of households that had access to credit depended on non-agricultural business as their primary income source.

In summary, households most vulnerable to food insecurity in the four cities were typically large poor, male-headed households with an uneducated head and many dependents. Vulnerable households had limited sources of income and no access to credit. Based on these findings, the study accepted the hypothesis that the above identified groups were most vulnerable.

CHAPTER 7:

CONCLUSIONS AND RECOMMENDATIONS

7.1. Synopsis

Using the secondary data from 2016/17 Integrated Household Survey of the National Statistics Office of Malawi, the study assessed and compared levels and severity of food insecurity and identified groups of the most vulnerable people in the four main urban centres of Malawi, namely Blantyre, Lilongwe, Zomba and Mzuzu. This study addressed three specific objectives. First, it compared the levels of food insecurity in the four main urban centres in Malawi using the Food Consumption Score, the Household Dietary Diversity Score, and food expenditure as a share of total household expenditure, the reduced Coping Strategy Index, the Months of Adequate Household Food Provision and an asset index. Second, the study determined the severity of food insecurity in urban Malawi through bivariate analyses of proportions across the six food security indicators. Finally, groups of most vulnerable people in Malawi's four major cities were identified using Spearman's rank correlation analysis.

The study established that despite most urban households consuming adequate diets, their diets consisted mainly of starchy foods rather than nutrient-rich foodstuffs. On average, the sampled households had enough food for eight months. The months of December, January and February were established to be the hardest to access food by most households. High food price fluctuation was identified as the primary reason for unstable food access by many. When faced with food shortages, most households resorted to relying on less preferred or cheaper foods. Most poor urban households spent significant shares of their income on food and such higher shares were associated with food insecurity. On average, sampled households owned ten classes of assets.

Based on the six food security indicator's findings, Lilongwe and Zomba were identified as the most severely food insecure city. In summary, households most vulnerable to food insecurity in the four cities were typically large poor, male-headed households with an uneducated head and many dependents. Vulnerable households had limited sources of income and no access to credit.

7.2. Conclusions

While Malawi's urban population continues to grow rapidly in these four cities, food insecurity seems relatively low and less severe compared to reported levels in Malawi's rural areas. Rural to urban migration is considered as one of the strategies for managing food security as urban areas are thought to offer better employment opportunities and social services. However, the conditions in Malawi's cities do not allow most people to thrive, making it harder for them to afford basic necessities such as quality food, water, sanitation and hygiene. Food insecurity was worst in Lilongwe and Zomba cities - the fastest growing among the four cities.

As in most urban food environments, urban dwellers purchase most food commodities, exposing households to food price fluctuations, especially during the lean agricultural season. Increased urbanisation has led to a decline in the number of producers in rural areas, most of which are small-scale farmers. The existing food producers are unable to meet the growing food demand in Malawi's cities; consequently, food prices are high and unaffordable to the urban poor. Most low income urban households in Malawi's cities spend higher proportions of their incomes on food, much of which does not meet minimum dietary diversity needs.

Food insecure urban households in Malawi's cities tend to adopt less severe food coping strategies which are less likely to compromise their long-term food consumption. However, the continued use of such strategies could prompt households to adopt even more severe strategies in the event of recurrent food or income shocks such as selling assets, making it even harder for households to bounce back.

Households most vulnerable to food insecurity in the four cities were typically large poor, male-headed households with an uneducated head and many dependents. Vulnerable households had limited sources of income and no access to credit.

7.3. Recommendations

Given that the urban food environment in Malawi is largely cash-based and that poor households are particularly vulnerable to income and price shocks, there is need to promote alternative livelihood development programmes, providing more stable sources of income for households. To ensure that the majority of urban residents have stable incomes, government needs to intensify skills development programs for the self-employed as well as those seeking or already in wage employment which will improve the quality of labor thereby increasing the probability of securing a decent livelihood.

While addressing the underlying causes of urban food insecurity is important, deliberate efforts that seek to positively impact food insecurity have to be promoted by the national government. These include connecting vulnerable urban households, especially those in informal settlements, to existing social services such as the food and cash for work programmes. As a means of promoting the consumption of nutritious foods, policy makers need to consider incorporating more nutrition-related material in school curricula starting from primary school.

Municipal governments need to establish market structures in places convenient to urban households, especially those in slum settings so as to improve food access. They also need to invest in the infrastructure such as roads and electricity which will promote food transportation, processing and storage.

Where possible, urban households could adopt homestead food production, specifically focusing on the nutrient dense foods such as vegetables, poultry and fish as these could significantly improve their diets in terms of nutrition. This initiative will assist households in reducing food expenditure, thereby freeing up resources for other equally important aspects to food security such as, sanitation, hygiene and health care. Urban households could also diversify their income portfolios through engaging in micro to small and medium enterprises to supplement the existing livelihood sources. Households also need to increase their savings to cushion them in the event of income and price shocks.

Non-governmental organisations and civil society organisations implementing various food security programmes need to direct some of their interventions towards cities, especially the low income suburbs rather than simply concentrating on rural areas. The private sector also needs to provide ready markets for inputs required to produce healthy foods in the urban areas.

7.4. Contribution to the knowledge

Given that there is little evidence available on food insecurity in the main urban centres of Malawi, this dissertation will add to the empirical evidence on urban food security in Malawi. Through the identification of the most vulnerable people, the study will improve the understanding of their characteristics. The knowledge of the most vulnerable people will contribute to designing policies and programmes that will effectively address their needs.

7.5. Recommendations for further research

It should be acknowledged that this study was limited to cross-sectional data from the 2016/17 Integrated Household Survey data of the National Statistics Office of Malawi, as such it only provided food security situation in relation to that period. Conducting a similar study using panel data of the Integrated Household Survey can be explored to understand urban food security trajectories in Malawi. Further, a study comparing the prevalence, severity and determinants of food insecurity between urban and rural areas in Malawi can be recommended. Given the high rates of urbanisation being experienced in Malawi, there need to explore the impacts of urbanisation on food security. Researchers can also consider investigating the impacts of food price changes on urban food security in Malawi, an area that has not been exploited to date.

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Appendix A: Ethics approval from Natural and Agricultural Sciences (NAS) Faculty



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Natural and Agricultural Sciences
Ethics Committee

E-mail: ethics.nas@up.ac.za

13 November 2018

ETHICS SUBMISSION: LETTER OF APPROVAL

Mr LM Mkusa
Department of Agricultural Economics Extension and Rural Development
Faculty of Natural and Agricultural Science
University of Pretoria

Reference number: 180000013

Project title: State of urban household food insecurity in Malawi: A case of Blantyre, Lilongwe, Mzuzu and Zomba cities

Dear Mr LM Mkusa,

We are pleased to inform you that your submission conforms to the requirements of the Faculty of Natural and Agricultural Sciences Ethics committee.

Note that you are required to submit annual progress reports (no later than two months after the anniversary of this approval) until the project is completed. Completion will be when the data has been analysed and documented in a postgraduate student's thesis or dissertation, or in a paper or a report for publication. The progress report document is accessible on the NAS faculty's website: Research/Ethics Committee.

If you wish to submit an amendment to the application, you can also obtain the amendment form on the NAS faculty's website: Research/Ethics Committee.

The digital archiving of data is a requirement of the University of Pretoria. The data should be accessible in the event of an enquiry or further analysis of the data.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'J. J. J.', written over a light blue rectangular background.

Chairperson: NAS Ethics Committee

Appendix B: Authorisation to use IHS 4 data

Telephone: 01 524 377/01 524 111
Fax: 01 525 130
E-mail: commissioner@statistics.gov.mw
Web Site: www.nso.malawi.net

Correspondence should be addressed to:
Commissioner of Statistics



In reply please quote Ref. No

NATIONAL STATISTICAL OFFICE,
P.O. BOX 333,
ZOMBA, MALAWI.

Ref. No. NSO/IHS/600/2

7th August, 2018

Leonard Mkusa
University of Pretoria
South Africa

Dear Sir,

**RE: AUTHORITY TO USE NSO IHS4 DATA IN PREPARING A
DISSERTATION TOWARDS FULFILMENT OF A MASTERS DEGREE IN
AGRICULTURAL ECONOMICS**

I acknowledge receipt of your letter on the above subject dated
6th August 2018.

I am pleased to inform you that authority has been granted for
you to use the IHS4 data as per you requested. We look forward to
your adherence to the specifications of the Memorandum of
Understanding between National Statistical Office of Malawi and
yourself (Mr Leonard Mkusa).

Attached is the Memorandum of Understanding.

Mercy Kanyuka (Mrs)
COMMISSIONER OF STATISTICS

Appendix C: Memorandum of agreement between Leonard Mkusa and NSO

Memorandum of agreement between Leonard Mkusa and National Statistics Office data in preparing a dissertation towards the fulfilment of Leonard Mkusa's Masters studies.

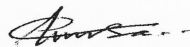
I, Leonard Mkusa am pursuing Masters studies in Agricultural Economics. I have requested NSO management for the provision, access and use of NSO data and information, for my research towards the fulfilment of the said Masters studies. The memorandum signed by me, serves as an undertaking by myself that:

1. The NSO data and information will only be used for my research studies and for no other purpose.
2. I will not disseminate the NSO data or information to any other party.
3. I will keep NSO information for my research confidential
4. I will not disseminate the results of my research to any other party other than for the purposes of research.
5. I will share my research with NSO before publishing and accept comments.
6. I will acknowledge NSO as the source of data and information in my research dissertation.
7. The views and opinions expressed in my dissertation will be mine and will not in any way represent policies and position of NSO.
8. NSO has no liability of any errors or omissions in my research dissertation. Errors or omissions in my research dissertation remain my sole responsibility.

Signed by:

Name: Leonard Mkusa

Signature:



Date: 6th August 2018

Accepted by:

Name: MERCY KANYUKA

Signature: 

Date:

