The relationship between food security and disaster risk reduction at the urban household level in the South African context

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Abstract

South Africa is considered to be a food secure country at the aggregate level as the country produces enough staple foods and has the capacity to import food if needed, however large numbers of households within the country are food insecure. Food security implies that the vulnerability to food insecurity needs to be reduced by achieving an adequate level of food consumption and maintaining this level at a low risk over time. It is the purpose of the research study to investigate whether disaster risk reduction provides a useful framing for the food security issue in order to achieve an adequate level of food consumption and to maintain this level at a low risk over time for urban households in South Africa.

In order to answer the research questions posed for the study and to provide a foundation for the research a review of literature was undertaken. The study considered the status and current developments of food security and disaster risk reduction on a global scale. The dynamics of food security in South Africa's urban areas including the relationship between poverty and food security and challenges relevant to the South African context was then discussed in order to provide background information and gain insight into the existing status of urban food security in the South African context. The study furthermore discussed the usefulness of approaching food security/hunger in urban South Africa from a disaster risk reduction perspective by making use of examples in the South African context.

The study found that South Africa is characterised by high levels of poverty and inequality which means that many households do not enjoy food security or adequate access to food. Urban food security is consequently highly dependent on money, but income poverty is not the only challenge to overcome and it is important that urban food security in South Africa be understood in connection with other developmental challenges such as rising food prices, urbanisation, the

HIV/AIDS epidemic and climate change. Natural or human-induced hazards can destroy livelihoods, reduce food production and increase hunger, thus affecting all dimensions of food security and efforts to address these hazards are important, as the risk of disasters can pose serious threats to sustainable development. It was further established that there is a relationship between food security and disaster risk reduction at the urban household level in the South African context. Disaster risk reduction activities can be successfully implemented to assist in avoiding or limiting the risk of potential shocks impacting on those vulnerable to food insecurity.

Keywords

Food security, disaster risk reduction, poverty, urban areas, South Africa.

List of Acronyms and Abbreviations

HIV - Human Immunodeficiency Virus

AIDS - Acquired Immune Deficiency Syndrome

UN - United Nations

FAO - Food and Agriculture Organisation of the United Nations

WFP - World Food Programme

IFSS - Integrated Food Security Strategy

WHO - World Health Organization

GEC - Global environmental change

IFPRI - The International Food Policy Research Institute

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CHAPTER 1

BACKGROUND AND ORIENTATION

1.1 INTRODUCTION

South Africa, as a middle income developing country that produces enough staple foods and has the capacity to import food if needed, is deemed a food secure nation at aggregate level (Hart, 2009a:30). Access to food, however, remains a problem for many South Africans and large numbers of households in the country are thus considered food insecure (Altman *et al*., 2009a:345). South Africa is currently experiencing a large-scale urban influx as people migrate to urban areas in search of better employment and education opportunities. These migrations create new social challenges in the urban areas of the country. One of the biggest social and developmental challenges in this regard is to ensure food security for all people living in urban areas (Van der Merwe, 2011a:1).

Disasters and food insecurity are directly related as natural hazards, prolonged crises and conflicts can reverse development, destroy livelihoods, reduce food production and increase hunger. The alleviation of hunger is therefore strongly correlated with disaster risk reduction, which seeks to protect livelihoods from shocks, to make food production systems more capable of absorbing the impact of disruptive events and recovering from such events (FAO, 2011:2). Effective disaster risk reduction is rooted in careful risk identification and analysis before prevention or mitigating actions are implemented. The likelihood of a disastrous occurrence should then be minimised by reducing either the intensity of external threats (hazards) or the vulnerability of those at risk (Holloway, 2003:35). In order to improve food security, it then becomes important to identify the risk involved and to determine who is vulnerable to this specific risk. Although the term “vulnerability” is commonly used in

development terminology, its meaning is often vague (Chambers, 2006:33), as the term has assumed different connotations in different contexts (Dilley & Boudreau, 2001:245).

Other bodies of knowledge that could be potentially relevant to the food security issue include migration, HIV/AIDS, urban livelihoods and climate change. De Waal and Whiteside (2003:1) propose that new aspects to the food crisis can be attributed largely to the effect of the HIV/AIDS pandemic in Southern Africa. Altman *et al.* (2009b:24) also confirm that HIV and AIDS interact negatively with food security at household level. Furthermore, climate change will probably affect the food security and livelihoods of agriculture-dependent populations in vulnerable countries, as climate change is likely to reduce agricultural productivity, production stability and general income in areas that already experience high levels of food insecurity (FAO, 2011:8). Karimanzira (1999:18) is also of the opinion that disasters are increasing with a greater incidence of weather and climate-related disasters that place stress on food security, infrastructure, and economies worldwide.

1.1.1 Food security

According to the definition adopted by the World Food Summit organised in Rome in 1996, food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 1996). This definition identifies four dimensions of food security, namely food availability, food access, food utilisation and food stability. *Food availability* implies the availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports. *Food access* implies the ability of a nation and its households to acquire sufficient food on a sustainable basis. *Utilisation* refers to the appropriate use of food, based on knowledge of basic nutrition and care, as well as adequate water and sanitation. Finally,

stability refers to the stability of the other three dimensions over time (Du Toit, 2011:2; FAO, 2008a:1).

The definition that the South African Department of Agriculture provides for the South African context, is similar to the above definition and states that "food security is defined as physical, social and economic access to sufficient, safe and nutritious food by all South Africans at all times to meet their dietary and food preferences for an active and healthy life" (Department of Agriculture, 2002:15). Food security can thus be described as the availability of, access to and utilisation of safe and nutritious food maintained over time, while considering potential natural, economic, social and political impacts.

A distinction can be made between food security at national, community and household levels (Twigg, 2004:253). At a national level, food security is achieved when the nation is able to manufacture, import, retain and sustain food needed to support its population. The residents of a community should be able to maintain a safe, culturally acceptable, nutritionally adequate diet through a sustainable system that maximises community self-reliance in order to achieve food security at a community level. A household, in turn, is regarded as food secure when the members of the family do not live in hunger or fear of starvation (Du Toit, 2011:3). Since communities and households have different needs in terms of food security, food security at these respective levels is assessed differently. Twigg (2004:253) points out that the monitoring and analysis of food insecurity should not only take place at different times during the year but also at different geographical levels and within different social classes. For purposes of this study, the vulnerability to food security at the urban household level is discussed.

Food insecurity furthermore has a temporal dimension that comprises chronic, transitory and seasonal food insecurity (Du Toit, 2011:4). Chronic food insecurity is long-term or persistent, whereas transitory food insecurity is short-term and temporary (Devereux, 2006:2). Chronic food insecurity occurs when

people are unable to meet their minimum food requirements over a sustained period of time. This can be the result of extended periods of poverty, lack of assets such as land, water, skills and knowledge and inadequate access to financial resources. Transitory food insecurity occurs when there is a sudden drop in the ability to produce or access enough food to maintain a good nutritional status and it results from short-term shocks and fluctuations in food availability and food access. Seasonal food insecurity is usually predictable and of limited duration, and will occur when there is a cyclical pattern of inadequate availability and acces to food (FAO, 2008a:1).

South Africa is largely deemed a food secure nation. The country produces enough staple foods and has the capacity to import food if needed in order to meet the basic nutritional requirements of the population (Du Toit, 2011:4). Altman *et al.* (2009a:345), however, are of the opinion that while South Africa may be food secure at a national level, large numbers of households in the country are food insecure. McLachlan and Thorne (2009:6) also confirm that household food insecurity, in both South Africa's rural and urban areas, is widespread and that malnutrition continues to affect the lives of millions of children and women in the country. Therefore, household food security in the South African context demands both an urban and a rural focus (Duncan, 1999:459) even though the causes, determinants and solutions for food insecurity differ in rural and urban settings (Crush & Frayne 2010:49). Most literature as well as development interventions concerned with food security focus on rural food security and the plight of the rural poor, while the issue of urban food security has been neglected (Crush & Frayne, 2010:6) despite the fact that chronic food insecurity is persistent in urban centres in Southern Africa (Frayne *et al.*, 2010:49).

According to Steyn (2006:33), the growing urban population brings about new social challenges that need to be addressed. These social challenges include lack of housing, poor sanitation and sewage disposal, lack of adequate energy and/or fuel sources, lack of access to clean water as well as high rates of

crime and violence. The rising food insecurity in urban areas is one of the biggest social and developmental challenges and remains a great cause for concern (Van der Merwe, 2011a:6). Ziervogel and Frayne (2011:6) state that urban food security demands a new focus as there is compelling evidence that the majority of the urban poor do not have equal or universal access to sufficient food, and that the food which is consumed is often highly processed and of poor nutritional value. Crush and Frayne (2010:7) also argue that Southern Africa's urban food insecurity is a large and growing challenge and that very little is actually known about the food security of the urban poor, the strategies that urban households adopt to feed themselves and the obstacles they face in doing so. Urban food insecurity therefore needs to be urgently added to the food security agenda of local and national governments, regional organisations and international organisations.

1.1.2 Disaster risk reduction

Disasters, especially those that seem principally to be caused by natural hazards, are not the greatest threat to humanity. Earthquakes, epidemics and famine are indeed devastating and many lives are lost through these disasters, but a much greater proportion of the world's population find their lives shortened by events that often go unnoticed, like violent conflict, illness and hunger (Wisner *et al.*, 2004:3). Disasters are therefore also the product of social, political and economic environments and it is important to reduce the risk of disasters and to build resilient societies and economies.

Disaster risk reduction is defined by the UNISDR (2004:17) as the conceptual framework of elements considered with the possibilities to minimise vulnerabilities throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development. Arnold (2008:9) defines disaster risk reduction as the development and application of policies, strategies and practices to do everything possible before a disaster occurs to protect lives, limit damage and

strengthen the capacity of communities and society to recover quickly. In terms of these definitions, disaster risk then involves a cumulative process in which natural, socio-natural and human-made threats are combined with human actions that create conditions of vulnerability (Valdés, 2006:3). Wisner *et al.* (2004:7) argue that disaster risk is a combination of the factors that determine the potential for people to be exposed to particular types of hazards.

Risk can then be defined as the probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damage) resulting from interactions between natural or human-induced hazards and vulnerable conditions (UNISDR, 2004:16). A disaster is therefore a function of the risk process and it results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk (UNISDR, 2004:17). It is also crucial to recognise that risks are inherent or can be created or exist within social systems.

Vulnerability, as one of the core concepts of disaster risk reduction, can be defined as the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of a community to the impact of hazards (UNISDR, 2004:16). Wisner *et al.* (2004:11) define vulnerability as the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard. The vulnerability dimension of food security consists of two components. Firstly, a household's food insecurity is a function of its exposure to shocks such as food price inflation; and secondly, it is a function of the household's ability to cope with these shocks (Devereux, 2006:8). Dilley and Boudreau (2001:231) define vulnerability directly in relation to an undesirable outcome such as food insecurity, hunger or famine within the food security context.

1.2 PROBLEM STATEMENT

South Africa is largely considered to be food secure at a national level (Du Toit, 2011:4). The South African Constitution entrenches the right to adequate nutrition for all, and the government devised the Integrated Food Security Strategy for South Africa (IFSS) to deal with food security issues in the country (HSRC, 2004:3). Yet, large numbers of households in the country are food insecure (Altman *et al.*, 2009a:345).

Food security implies that the vulnerability to food insecurity needs to be reduced by achieving an adequate level of food consumption and maintaining this level at a low risk over time (Devereux, 2006:8). Vulnerability has many dimensions, including economic, social, demographic, political and sociological dimensions, and is therefore not related to poverty alone, although the poor tend to be more vulnerable (Twigg; 2001:1). Du Toit (2011:3) asserts that the concepts of food insecurity and poverty in a country are interrelated and influence one another, as poverty refers to the condition of not having the means to afford basic human needs such as clean water, nutrition, health care, education, clothing and shelter. Van der Merwe (2011a:2) also argues that urban residents have to purchase most of their food, whereas people living in rural areas can produce their own food at a much lower cost, which implies that urban food security is highly dependent on the availability of money.

The nature of the relationship between disaster risk reduction and food security within South Africa needs to be further explored. The study aims to evaluate whether the disaster reduction vernacular provides a useful framing for the food insecurity problem in the country's urban areas.

1.3 RESEARCH QUESTIONS

Based on the phenomenon described above, the following research questions are formulated to guide this study:

1. What are the prevailing theories pertaining to disaster risk reduction and urban food insecurity?
2. What is the relationship between disaster risk and food security in urban areas in the South African context?
3. What recommendations can be made to improve food security by reducing vulnerability to food insecurity in terms of the prevailing theories?

1.4 RESEARCH OBJECTIVES

Based on the above research questions, this study has the following research objectives:

1. Investigate the prevailing theories pertaining to disaster risk reduction and urban food insecurity.
2. Determine the relationship between disaster risk and food security in urban areas in the South African context.
3. Make preliminary recommendations in terms of the prevailing theories pertaining to vulnerability and food insecurity in the South African context.

1.5 RESEARCH METHODOLOGY

This study is qualitative in nature. The research is descriptive and analytical and a literature review forms the basis of the research. This involved the

collection and analysis of existing data. Data used for the research included academic articles, books, government reports and international reports, conference proceedings as well as research reports and documents.

1.5.1 Literature review

The literature review consists of an extensive review of secondary literature resources with the focus on summarising and discussing the arguments and ideas on the subject contained in previous published works. This contributes in developing a good understanding of the concepts of disaster risk reduction and food security as well as providing insight into previous research.

The review of the literature attempts to provide answers to the research questions and ultimately to provide a foundation for the research. National and international sources were consulted in order to provide background information and to gain insight in the most current developments on the topic.

1.5.2 Data collection and analysis

Data collection consisted of a conventional literature search aimed at capturing books and journal articles with information on the subject as well as related fields. Various additional sources have also been used to collect data. The internet allowed access to the publications and databases of a variety of organisations and government institutions, for example United Nations (UN) agencies like the Food and Agriculture Organisation of the United Nations (FAO), the World Food Programme (WFP), the World Health Organization (WHO) and the International Food Policy Research Institute (IFPRI) as well as national government departments and municipalities. The following databases have also been consulted to ascertain the availability of material for the purpose of this research:

a) Catalogue of theses and dissertation of South African Universities (NEXUS);
b) Catalogue of books: Ferdinand Postma Library (North-West University); and
c) Sabinet Online (SA ePUBLICATIONS).

The data collected was analysed and the concepts of disaster risk reduction, disaster risk management and food security, as well as relevant interpretive frameworks are discussed in detail. The relationship between disaster risk reduction and food security is explored by providing background information into the status and current developments on the topic on a global scale. The dynamics of urban food (in)security in South Africa are considered and analysed in terms of relevant interpretive frameworks, and the usefulness of approaching food security in urban South Africa from a disaster risk reduction perspective is discussed. Additional potentially relevant literature on migration, HIV/AIDS, urban livelihoods and climate change is also consulted in order to investigate the relationship between these concepts and the food security issue in terms of South African urban households.

1.6 SIGNIFICANCE OF THE STUDY

This research was aimed at investigating whether disaster risk reduction provides a useful framing for the food security issue in order to achieve an adequate level of food consumption and to maintain this level at a low risk over time for urban households in South Africa.

This will highlight the key significance of vulnerability and poverty in food production and the way these factors affect food security. The multi-disciplinary and multi-dimensional nature of the study could also allow it to contribute to the field of sustainable development as environmental, social, political and economic influences are discussed.

1.7 CHAPTER LAYOUT

Chapter two consists of a discussion of food security, disaster risk reduction, disaster risk management and interpretive frameworks. The chapter provides background information and gain insight into the status and current developments on the topics on a global scale and highlights the relevance of the sustainable livelihood approach and vulnerability theories.

Chapter three investigates the dynamics of food security in South Africa's urban areas. Food security in South Africa is discussed in order to provide background information and gain insight into the existing status of urban food security in the South African context. Poverty in relation to food security and challenges relevant in the South African context is also discussed.

Chapter four consists of a discussion of the usefulness of approaching food security/hunger in urban South Africa from a disaster risk reduction perspective by making use of examples in the South African context.

Chapter five provides conclusions and recommendations based on the research conducted. The conclusions are discussed according to the research questions proposed for the study, and a brief summary of the findings relating to the research objectives is also included.

1.8 CONCLUSION

The first chapter of the research study provides the framework by which the rest of the study was conducted. It provides a background to the problem and introduces the problem statement. The research objectives and research questions arising from the problem statement are outlined and the purpose of the investigation and the significance of the study are also discussed. The

chapter concludes with a delineation of the main focus of each of the chapters that follow.

CHAPTER 2

FOOD SECURITY AND DISASTER RISK REDUCTION

2.1 INTRODUCTION

The nature of the relationship between disaster risk reduction and food security within the South African context as well as internationally needs to be further explored. This chapter provides background information and gain insight into the status and current developments on the topic on a global scale, which in turn enable the researcher to apply the discussion in further chapters in an analysis of the situation in South Africa and thus answer the research questions. The following aspects are discussed in this chapter:

Firstly, the concept of food security is addressed to include an overview of the food security definition and its components, consisting of availability, access, utilisation and stability with specific attention to urban environments and food systems. The purpose of this discussion is to consult national and international sources on the topic in order to establish a baseline as to the current situation regarding food security in the world. The second section of this chapter serve as a general introduction to the concepts of poverty and vulnerability and the way these factors are linked with food security. The importance of poverty lines as a tool for measuring poverty is also discussed. The chapter concludes by highlighting the relevance of disaster risk reduction and disaster risk management to the particular study. Special attention is given to the sustainable livelihood approach and vulnerability theories.

2.2 THE FOOD SECURITY DEFINITION AND THE CONCEPT OF FOOD INSECURITY

In Chapter 1 food security is described in terms of the FAO and South African definitions as the availability of, access to and utilisation of safe and nutritious food maintained over time, while considering potential natural, economic, social and political impacts (FAO, 1996; Department of Agriculture, 2002:15). The World Health Organization (WHO) (2015) describes food security as a complex sustainable development issue, linked to sustainable economic development, environment and trade.

The concept of food insecurity refers to “the limited, inadequate or insecure access of individuals and households to sufficient, safe, nutritious, personally acceptable food both in quality and quantity to meet their dietary requirements for a healthy and productive life”. Food insecurity can therefore be interpreted as deprivation in the basic need for food and as absolute food deprivation at its most severe stage (Tarasuk, 2001:2). It can then be said that food insecurity occurs when one or more of the dimensions of food security are weakened, because the availability of, access to, and utilisation of food are interconnected and a single element cannot assure food security on its own (StatsSA; 2012a:3).

Social, economic and political factors are increasing food insecurity in Southern Africa. Key indicators are the rising levels of chronic and severe malnutrition and rates of stunting in children (GECAFS, 2006:6). Malnutrition is an abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients (FAO, 2013a:50). Stunting refers to being too short for one’s age (FAO, 2013a:21) and is an indicator of chronic malnutrition (Devereux, 2006:25). Historically food insecurity has resulted from a combination of factors, including *inter alia* changing demographics, poor agricultural infrastructure and widespread poverty. Other socio-economic issues like large-scale urban migration,

HIV/AIDS and global environmental change (GEC) add further stress and complicate what is already a food insecure situation for many (GECAFS, 2006:6). These dynamics are further discussed in later chapters.

2.3 FOOD SECURITY AND FOOD SYSTEMS

According to Ziervogel and Frayne (2011:2) the 1996 FAO definition for food security overlooks the idea of sustainable food production. Following the 1996 FAO definition of food security, Ingram (2010:2) is of the opinion that food security is based on the stability of food availability, food access and utilisation, while it is underpinned by food systems and not just food production, and if any component of the food system is stressed, food security will be weakened. Food production is thus only included as an activity of a food system and it is recognised that the components of food security extend beyond food production to encompass broader socio-economic issues. The International Food Policy Research Institute (IFPRI) (2015) also includes the concept of food systems and sustainable use of natural resources in its 2020 Vision for Food, Agriculture, and the Environment to consist of “a world where every person has access to sufficient food to sustain a healthy and productive life, where malnutrition is absent, and where food originates from efficient, effective, and low-cost food systems that are compatible with sustainable use of natural resources”.

Food systems are commonly described as the production, processing, distribution and consumption of food (Ziervogel & Frayne, 2011:17). Ericksen *et al.*, 2009:374) describe food systems as comprising of four sets of activities that lead to a number of outcomes which contribute to food security as well as environmental and social welfare. These activities relate to food production, processing and packaging of food, distribution and retailing of food and the consumption of food (Ingram, 2010:4; Ericksen, 2008:6), whereas the outcomes of these activities contributing to food security include availability,

access, utilisation and stability (Ericksen *et al.*, 2009:374). The contribution to social welfare includes, for example, livelihoods, which are discussed later on and the contribution to environmental welfare includes emissions of greenhouse gasses and changes in land use (Ingram, 2010:4).

2.4 RURAL AND URBAN FOOD SECURITY

Living in an urban environment could be associated with increased affluence, but it could also increase consumption expectations, thereby raising food demand *per capita* and local prices. The urban poor however spend a large proportion of their income on food and are acutely sensitive to food price fluctuations (Ingram, 2012:4). Rapid urbanisation is however, not associated with increased incomes and better standards of living in Southern Africa where urban food security is a growing development concern and fundamentally different to questions of food security within the rural and agricultural sectors (Crush & Frayne; 2010:15). Although a higher proportion of the South African rural population is poor, the proportion of the poor who lives in rural areas is declining as a result of rural to urban migration (Leibbrandt *et al*., 2005:21).

According to Crush and Frayne (2010:29) the lack of adequate housing and poor access to infrastructure and social services are some of the socio-economic problems facing the large number of people living in urban informal settlements. In addition to these hardships, the high costs associated with urban shelter, transport, access to health care and education also create a challenge for the urban poor to access sufficient food. Urban food security is furthermore not primarily about production or availability of food and these issues are seldom the major constraint in terms of urban food security. Access to food is the critical factor for the urban poor as access is often determined by affordability, which can depend on scarcity. As a result, price increases can have an effect on urban food supply (Ziervogel & Frayne; 2011:20). The lack of access to food for the urban poor, especially children, is a critical issue as

malnutrition still affects at least one third of the developing world's population. Malnutrition is the outcome of chronic food insecurity and hunger and is still a major development issue in Southern African cities (Ziervogel & Frayne, 2011:4).

Crush and Frayne (2010:35) state that urban food security is scarcely more visible to policymakers today than suggested by Daniel Maxwell during the 1990's. Maxwell (1999:27) suggested several reasons for the political invisibility of urban food security in contemporary African cities. He argued that "urban food insecurity is obscured by more urgent urban problems" including unemployment, overcrowding, decaying infrastructure and declining services; that national policymakers have tended to focus less on urban food insecurity than on food insecurity in rural areas and that as long as food insecurity is a household-level problem and does not translate into a political problem, it does not attract policy attention. Crush and Frayne (2010:35) then further argue that except for urban agriculture, these reasons are still applicable to urban food security.

2.5 DETERMINANTS OF FOOD SECURITY IN SA URBAN AREAS

As is evident from the 1996 FAO definition the major components of food security consist of availability, access, utilisation and stability, concepts that should be discussed in detail.

2.5.1 Availability

The availability of food depends on the production, distribution and exchange of food. Production includes the production of adequate crop, livestock and fisheries. The collection of wild foods and resources for migratory and indigenous communities is also seen as production (Ziervogel & Frayne, 2011:3). Distribution relates to how food is moved to be available for

consumption. This includes transportation and infrastructure, public safety nets, storage facilities, governance, security and the enforcement of trade barriers and borders. Exchange can be perceived as the amount of food available, obtained through exchange mechanisms such as trade, purchase, or loans as opposed to local production (Ericksen, 2008:7). The major elements of a secure food supply include domestic production, reliable import capacity, presence of food stocks and access to food aid when necessary (Ziervogel & Frayne, 2011:3).

The food availability in an urban area is mainly determined by food supply to cities. These food supply systems to cities include a complex distribution chain, involving wholesalers, intermediaries, distributors and street vendors. This distribution chain can potentially increase the price of food which in turn will have a negative impact on the ability of the urban poor to access adequate and nutritious food products due to their vulnerability to price increases stemming mainly from limited income or limited opportunities to generate income (Van der Merwe, 2011a:2).

South Africa has largely maintained its ability to meet national food requirements and to provide food in sufficient quantities and of appropriate quality to consumers (StatsSA, 2012a:53). The country's large-scale commercial farming sector ensures that the country produces most of its food internally and distribution of food products largely takes place through the formal market system based on supermarkets (Ngandu *et al*., 2010:106).

2.5.2 Access

Food accessibility refers to food affordability, allocation and preferences that enable people to effectively translate their hunger into demand (Ziervogel & Frayne, 2011:3). Affordability can be seen as the purchasing power of households or communities relative to the price of food, which can be affected by pricing policies and mechanisms, seasonal and geographical variations in

price, local prices relative to external prices as well as income and wealth levels. The mechanisms governing when, where, and how food can be accessed by consumers constitute allocation; and preference are the social or cultural norms and values that influence consumer demand for certain types of food. Preference can be determined by religion, season, advertising, preparation requirements, human capital, tastes and customs (Ingram, 2009:13).

Large scale inequality and poverty mean that many households do not enjoy food security or adequate access to food (StatsSA, 2012a:53). The challenge of urban food insecurity is therefore primarily one of access and not availability (Battersby, 2012:141; Warshawsky, 2011:810; Crush, 2012:38). City dwellers tend to be dependent on cash to acquire food and as a result of this dependence on the market, any weaknesses in the urban food system are likely to drive households into food insecurity (Battersby, 2011: 547). The inability to gain access to adequate, nutritious food however mainly stems from limited income or limited opportunities to generate income and the fact that the urban poor often pay more for food since they are forced to buy small quantities of food due to limited income (Van der Merwe, 2012a:2).

Further constraints to sufficient food access can include the location of supermarkets or informal markets, which are not necessarily located close to residential areas where the poor reside as well as the cost implication of transport to these markets (Tacoli, 2013:3). Access also varies considerably from household to household, within the poor areas of the city, with wage employment, other income-generating activity, the size and structure of the household, the educational level of the household members and access to social grants all playing a role (Crush, 2012:38). According to Frayne, Crush, *et al*. (2014:103) the urban poor are also exposed to both acute and chronic problems of food access, which negatively impact on nutritional status at all stages of the life cycle, from conception to adulthood, and also in old age.

2.5.3 Utilisation

Food utilisation refers to the ability of a person to utilise food and nutrients depending on age, health and disease, as well as the quality of food intake. Poor health and sanitation, inadequate safety standards and chronic illness may compromise a person's digestion and undermine nutrient intake (Ziervogel & Frayne, 2011:3). Another element of food utilisation is social value where eating meals together may be an important part of kinship, or it may be important to always have food for guests or special foods as an integral part of important holidays (Ericksen, 2008:7).

In the South African context notable differences between eating patterns of different ethnic and cultural groups and between urban and rural areas are evident. Urbanisation also brings about a change in lifestyle and diet which include a subsequent higher intake of fat, sugar and salt. These changes have a negative effect on the health of urban residents and pose a great health challenge for urban dwellers (Van der Merwe, 2011a:2; Drimie *et al*., 2013:2). There is a strong relationship between food security and dietary diversity evident in the fact that when food insecurity increases, dietary diversity declines. It is no surprise that malnutrition and underweight therefore affect a large proportion of poor people in Southern African cities (Frayne, Crush, *et al*., 2014:104). A common coping response to household food insecurity is reducing the quality and quantity of food and skipping meals, while at the same time working longer hours which has long-term health consequences (Tacoli 2013:2). Malnutrition furthermore continues to affect the lives of millions of children and women in South Africa (McLachlan & Thorne, 2009:6) and overnutrition is another significant nutritional problem associated with urbanisation as levels of obesity are escalating rapidly in Africa's cities. It can therefore be said that a double burden of undernutrition and overnutrition are affecting poor urban communities and households in Southern Africa (Frayne, Crush, *et al*., 2014:108).

2.5.4 Stability

Food stability is the stability of food availability, access to food and the utilisation of food over time (FAO, 2008a:1). Continuity in the urban food supply and access to food can be affected by seasonal variations in food supply or income caused by climate variability, price fluctuations, and political and economic factors (Ziervogel & Frayne, 2011:3). Stability in this context then refers to sustained access to nutritious food despite suffering shocks such as conflict, droughts, or death or unemployment at a household level (Chitiga-Mabugu *et al*., 2013:3).

Achieving food security therefore requires that households have adequate resources to obtain appropriate foods for a nutritious diet and that availability of physical supplies of food is sufficient. Furthermore, households must be able to utilise food in that they have access to essential nutrients, potable water, adequate sanitation and the appropriate knowledge about optimum food utilisation (StatsSA, 2012a:5).

2.6 FOOD SECURITY, POVERTY AND VULNERABILITY

The preceding sections have focused on the food security definition and its components as a general discussion. As mentioned in the Problem Statement in chapter 1, poverty and vulnerability are significant factors which affect food security and these factors also influence one another. There has been considerable research on the connection between poverty and food security and researchers agree that poverty and hunger as well as the causes thereof are closely related (Devereux, 2006:12; Tacoli, 2013:1; UN, 2008:2).

Poverty can refer to several different forms of human deprivation such as a lack of resources, including the lack of income, housing and health facilities, a lack of knowledge and education (Oldewage-Theron & Slabbert 2010:1) as

well as hunger, malnutrition and disease (Ahmed & Siwar, 2013:353). Poverty, in its most general sense, is therefore the lack of necessities based on shared values of human dignity (Bradshaw 2006:3). Poverty can further be perceived as either absolute or relative. Absolute poverty refers to the inability of the poor to afford the basic or minimal necessities of life, in other words deprivation of basic human needs such as food or shelter. Absolute poverty therefore relates to the definitions of poverty given above. Relative poverty is based on a socially constructed belief where a person is considered poor when they are in a clearly disadvantaged situation, either financially or socially, with regard to other people in their environment and this type of poverty is also closely linked to the notion of inequality (Machado, 2006:4; INE, 2009:2).

Complex interactions along a number of dimensions pose difficulties for measuring poverty as well as identifying strategies for poverty reduction (Chagunda & Taylor, 2014:2). In this regard, poverty lines are important tools that allow for statistical reporting of poverty levels and patterns as well as planning for poverty reduction in any population (StatsSA, 2015:1). The poverty line is the level of welfare that distinguishes poor households from non-poor households and is a pre-determined and well-defined standard of income, or value of consumption (Baiyegunhi, 2014:51). For purposes of this research, poverty is defined as individuals or groups of people living below the poverty line. Statistics South Africa makes use of a set of three national poverty lines in order to measure poverty in the country (StatsSA, 2014a:7). These poverty lines are discussed in more detail in chapter 3.

Although food typically accounts for half of the total expenditure of poor households (FAO, 2008b:76), further socio-economic variables of the households are also important determinants of their poverty and food security status (Ahmed & Siwar, 2013:353). These variables include the living environment, shelter and employment (Smith, 1998:212). Poor urban households obtain their food from retail outlets such as supermarkets and informal stores or through self-production. Additionally, food can be obtained

through institutionalised food aid or as gifts from friends or family living in rural areas (Smith, 1998:212). Rising food costs and inadequate incomes are major factors contributing to poverty and food insecurity and many poor households just cannot afford adequate amounts of safe and nutritious food even though there is enough food available (Ash, 2013:54). A large proportion of low-income urban residents, for example, tend to live in small overcrowded dwellings with limited space for cooking and proper storage of food, which lead to food purchases in small quantities and at higher prices (Tacoli, 2013:2). Other shocks, such as drought, floods and economic crises, especially when occurring in rapid succession with insufficient recovery periods in between can also have an impact on food and nutrition security. These shocks have the ability to force already poor households to dispose of their assets, which leads to further poverty and a weakened ability to access adequate food (Gustafson, 2013:398; Devereux, 2006:10).

Strategies to fight poverty must be integrated with policies to ensure food security, although food security alone does not eradicate poverty and conversely, economic growth alone might not be enough to ensure food security (ADB, 2012:6). Although broad-based income growth is necessary to alleviate global hunger in a sustainable way (Ash, 2013:54), additional interventions to include policies that enable people to make a viable living, is required. According to (Devereux, 2006:12), these can include economic policies to promote market development, asset redistribution in the form of land reform policies, health and education services and employment creation programmes.

It is evident that there are many complex reasons for a low-income urban household to become food insecure; however, poverty seems to be at the core of the problem. It is therefore important to understand the root causes of poverty in an urban environment in order to suggest prevention and reduction strategies for food insecurity. Impacts on poverty and food security as well as

coping mechanisms and appropriate interventions in the South African urban context are explored in chapter 3.

According to Devereux (2006:11) households' vulnerability to chronic and transitory food insecurity is often inseparable. The intensity of food insecurity experienced by these households often fluctuates between moderate and severe. When a household's livelihood strategy does not enable the households to prepare for future shocks or gradual changes through the accumulation of resources, households will become more vulnerable to severe food insecurity. The concept of vulnerability is further discussed in terms of disaster risk reduction in the following sections.

2.7 DISASTERS AND DISASTER RISK

Disasters affect the most vulnerable sectors and population groups in society with the least capacity to cope. These groups include the very poor, women, children and the elderly, which often live and work in high-risk areas, rely on climate dependent livelihoods and have few assets or resources to cope with and respond to disasters and recurring shocks (UNEP, 2010).

A disaster can be defined as a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources (UNISDR, 2004:17). This definition entails that an event has to occur, which is serious enough that the day to day activities of a specific group of people are interrupted in a way that prevents them from continuing their normal existence without help from an outside source. This situation would imply that a disaster occurred as a result of people being at risk. In this instance risk can then be defined as the probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting

from interactions between natural or human-induced hazards and vulnerable conditions (UNISDR, 2004:16). This definition highlights hazard and vulnerability and the interaction between the two concepts as critical in establishing risk and it is therefore fitting that risk is conventionally expressed by the equation: Risk = Hazard x Vulnerability (Wisner *et al*., 2004:49).

In light of this equation, a hazard is a potentially damaging physical event, a phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins which include natural or human induced processes (UNISDR, 2004:16). Vulnerability has already been discussed elsewhere, but it is important to note that in order to understand disasters one must not only be knowledgeable about the types of hazards that might affect people, but also the different levels of vulnerability of different groups of people (Wisner *et al.*, 2004:7). In addition to hazards and vulnerability and their relationship to risk, the coping capacity as a combination of all the strengths and resources available within a community, society or organisation, can reduce the level of risk, or the effects of a disaster (UNISDR, 2004:16). Capacity, as opposed to vulnerability, is therefore a positive factor, which increases the ability of people to cope with hazards. Following the above definitions, a disaster can be seen as a function of the risk process and it results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk (UNISDR, 2004:17).

Disaster risk can be seen as a cumulative process that combines natural, socio-natural and human-made threats with human actions that create conditions of vulnerability. This vulnerability determines a society's level of susceptibility to a threat that can cause damage to a community and affects people (Valdés, 2006:3). Wisner *et al.* (2004:7) also argues that disaster risk is

a combination of the factors that determine the potential for people to be exposed to particular types of hazards.

2.8 DISASTER RISK REDUCTION, DISASTER RISK MANAGEMENT AND DISASTER MANAGEMENT

Disaster risk reduction, as defined in chapter 1, can be seen as the conceptual framework of elements considered with the possibilities to minimise vulnerabilities throughout a society, to avoid or to limit the adverse impacts of hazards, within the broad context of sustainable development (UNISDR, 2004:17). Van Niekerk (2008:371) states that various international disasters, professional constituencies and international organisations contributed to the development of disaster risk reduction and that some aspects such as the disaster relief agenda and disaster response were major role players in the development of the term disaster risk reduction. It was however the relative lack of prevention measures to disaster events which highlighted disaster risk reduction internationally. The definition focuses on risk aversion and not merely disaster relief in that it aims to reduce the risk of hazards impacting on vulnerable conditions and in doing everything possible before a disaster occurs to protect the lives of people and their livelihoods. According to Holloway (2003:34), effective disaster risk reduction roots itself in careful risk identification and analysis before implementing prevention or mitigation actions. It is therefore important to understand the potential risk and to develop and implement the relevant policies, strategies and practices accordingly.

Disaster risk management, on the other hand, is the systematic process of using administrative decisions, organisation, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid

(prevention) or to limit (mitigation and preparedness) adverse effects of hazards (UNISDR, 2004:17). The components of disaster risk management also include risk identification, risk mitigation and risk financing (Arnold, 2008:12). Subsequent to this definition, disaster risk management constitutes the activities focused on reducing risks and vulnerabilities and the tools used to achieve these goals. These actions should be performed by all organs of state and departments as integrated activities in order to reduce the effects of a disaster risk.

It is clear from the above definitions of disaster risk management and disaster risk reduction, that disaster risk management is the application of disaster risk reduction and is responsible for the implementation of policies, strategies and practices and that disaster risk reduction relates to the achievement of these policies, strategies and practices. According to Van Niekerk (2006:96) the cornerstone of successful and effective disaster risk management is the integration and coordination of all the role-players (including all spheres of government, the private sector, civil society, non-governmental organisations, research institutions and institutions of higher learning) and their activities into a holistic system aimed at disaster risk reduction.

Disaster management is defined by the Disaster Management Act 57 of 2002 as a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures aimed at preventing or reducing the risk of disasters, mitigating the severity or consequences of disasters, emergency preparedness, a rapid and effective response to disasters and post-disaster recovery and rehabilitation (Van Niekerk, 2006:97). Van Niekerk (2006:98) states that this definition rather refers to disaster risk management because it places emphasis on the implementation of measures to reduce risk, as well as on a multi-sectoral and multidisciplinary approach. According to Twigg (2004:3) risks are located at the point where hazards, communities and environments interact, and all of these aspects must be addressed. Disasters

are therefore no longer seen as unfortunate one-off events to be responded to, but also as inherent and longer-term problems that must be planned for.

Disaster Management can thus be seen as measures implemented for post disaster mitigation, or a so-called preparedness for response in order to deal with the consequences of a disaster, whereas disaster risk reduction and disaster risk management relates to measures implemented in terms of policies to reduce the risk that the disaster might happen.

2.9 SUSTAINABLE LIVELIHOOD APPROACH AND VULNERABILITY THEORIES

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintains or enhances its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers & Conway, 1991:6). Investment on strengthening and diversifying the sources of livelihoods of the people of disaster prone areas can be an effective strategy for disaster risk reduction in the long run (Yodmani, 2001:7).

The sustainable livelihoods approach is a way of thinking about the objectives, scope and priorities for development (DFID, 1999). The approach takes into account poor people as the centre of the development process and embraces the complexity of rural livelihoods from the perspective of the poor and thereby increasing the effectiveness of development assistance (Ahmed & Siwar, 2013:352). There are six core principles of the sustainable livelihoods approach. These principles indicate that poverty-focused development activity should firstly be people-centred in that sustainable poverty elimination will be achieved only if external support focuses on what matters to people, understands the differences between groups of people and works with them in

a way that fits in with their current livelihood strategies, social environment and ability to adapt. Secondly, it should be responsive and participatory where poor people must be the key actors in identifying and addressing livelihood priorities and where outsiders need processes that enable them to listen and respond to the poor. It should thirdly be multi-levelled to ensure that local-level activity informs the development of policy and an effective enabling environment, and that higher-level policies and institutions support people to build upon their own strengths. Poverty-focused development activity should in the fourth place be conducted in partnership with both the public and the private sector as role-players. It should, in the fifth instance, be sustainable, because a balance must be found between economic, institutional, social and environmental sustainability. Finally, it must be dynamic in the sense that external support must recognise the dynamic nature of livelihood strategies, respond flexibly to changes in people's situations, and develop longer-term commitments (Ashley & Carney, 1999:7). The sustainable livelihoods approach has been widely used in recent development programmes that aim to reduce poverty and vulnerability in less developed countries and is typically set out in the form of a framework that brings together assets and activities that are thought to comply with the livelihood definition and illustrates the interactions between them (Ahmed & Siwar, 2013:352).

The pressure and release model and access model are two complementary theories that explore disaster risk and vulnerability. The relationships between disaster risk, vulnerability, hazard and coping capacity can be derived from these theories (Schilderinck, 2009:11). These models originally presented in 1994, and re-introduced by the same authors in an improved format in 2004, are not inconsequential details but tools that allow a carefully crafted explanation of disasters at different levels (Wisner *et al*., 2004:31).

2.9.1 Sustainable livelihoods framework

The livelihoods framework is an approach to help understand and analyse livelihoods, mainly the livelihoods of the poor (DFID, 1999) and it forms the core of the sustainable livelihoods approach (Kollmair & Gamper, 2002:4). According to Ahmed and Siwar (2013:352), the framework brings together assets and activities that are thought to comply with the livelihood definition and illustrates the interactions between them. The framework summarises the main components of and influences on livelihoods. It starts with the vulnerability context in which people live their lives and the livelihood assets that they possess. It goes on to look at how transforming structures and processes generate livelihood strategies that lead to livelihood outcomes (DFID, 1999; Majale, 2002:4).

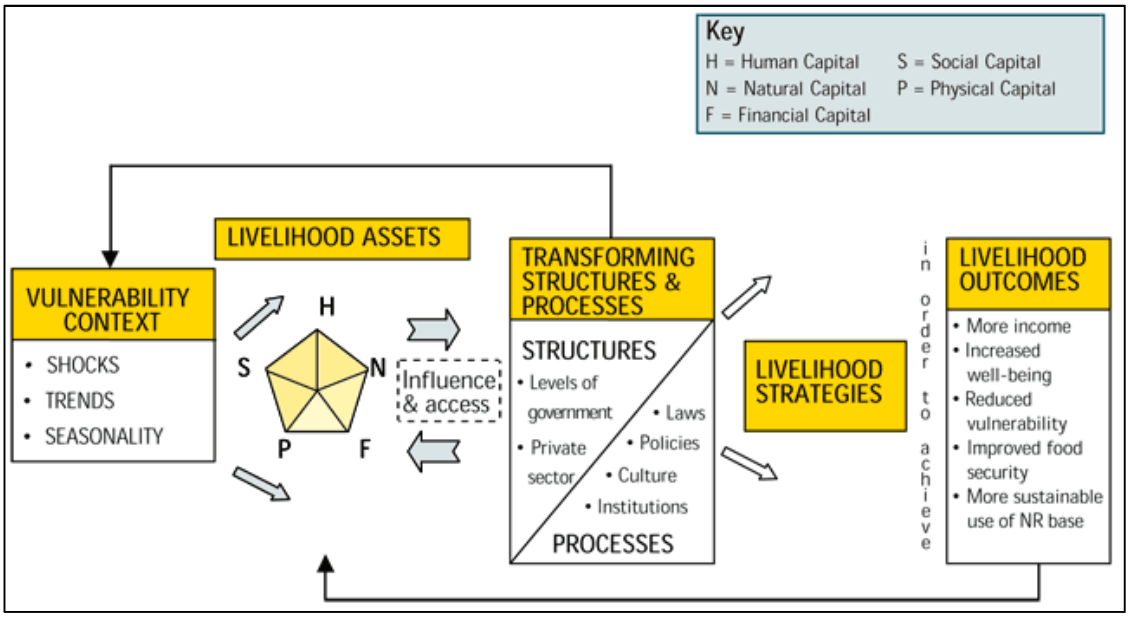

Figure 2.1: Sustainable Livelihoods Framework
(Source: DFID, 1999)

The approach views people as operating in a context of vulnerability, and the vulnerability context frames the external environment in which people exist. Three main categories of vulnerability, namely trends, shocks and seasonality are presented in the framework (Twigg, 2001:10). Trends include population

trends, resource trends, economic trends, trends in governance and politics and technological trends. Shocks include human health shocks, natural shocks, economic shocks, conflict and crop/livestock health shocks. Seasonality is expressed through seasonal shifts in prices, production, food availability, employment opportunities and health (Twigg, 2001:10; Ahmed & Siwar, 2013:352).

The framework considers the livelihood assets or types of capital owned, controlled, claimed, or by some other means accessed by the household (Ahmed & Siwar, 2013:352). According to Serrat (2008:2) these are human capital, social capital, natural capital, physical capital and financial capital. Human capital represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives (DFID, 1999). Social capital is the social resources upon which people draw in pursuit of livelihoods objectives (Serrat 2008:2). Natural capital includes the natural resource stocks from which resource flows and services such as land, water, forests, air quality, erosion protection, biodiversity and environmental resources useful for livelihoods are derived (Kollmair & Gamper, 2002:7). Physical capital is the basic infrastructure and producer goods needed to support livelihoods such as affordable transport, secure shelter and buildings, adequate water supply and sanitation, affordable energy and access to information (Serrat 2008:2). Financial capital includes savings and credit as well as inflows of money other than earned income (Ahmed & Siwar, 2013:352). Although financial capital tends to be the asset that is the least available for the poor, it is probably the most versatile as it can be converted into other types of capital or it can be used for direct achievement of livelihood outcomes, for example to purchase food in order to reduce food insecurity (Kollmair & Gamper, 2002:7).

Transforming structures and processes within the framework are the institutions, organisations, policies and legislation that shape livelihoods (Twigg, 2001:11). These various structures and processes directly enable or

impede the households' access to both assets and activities they need (Ahmed & Siwar, 2013:352). They operate at all levels, from the household to the international arena, as well as in the private and public spheres and effectively determine access to the five different types of capital, livelihood strategies and decision-making bodies, terms of exchange between different types of capital and economic and other returns from livelihood strategies (Twigg, 2001:11). Transforming structures and processes occupy a central position in the framework and directly feed back to the vulnerability context (Kollmair & Gamper, 2002:8).

Livelihood strategies refer to the range and combination of activities and choices that people make or undertake in order to achieve their livelihood goals (DFID, 1999). Activities can be combined to meet various needs at different times and on different geographical or economical levels, and may even differ within a household (Kollmair & Gamper, 2002:8). Livelihood strategies can be described at an individual, household level and regional or national levels and the ability to pursue different livelihood strategies is dependent on the basic material and social, tangible and intangible assets that people have in their possession (Scoones, 1998:7). It is evident that this approach seeks to promote choice and opportunity as well as diversity (DFID, 1999).

Livelihood outcomes are the achievements or outputs of livelihood strategies (DFID, 1999). A livelihood outcome is sustainable if people are able to maintain or improve their standard of living related to wellbeing and income or other human development goals, reduce their vulnerability to external shocks and trends, and ensure their activities are compatible with maintaining the natural resource base (Allison & Horemans, 2006:759). The livelihood outcomes are divided into five categories which include more income, increased wellbeing, reduced vulnerability, improved food security and a more sustainable use of the natural resource base (DFID, 1999; Kollmair & Gamper, 2002:9).

Although the sustainable livelihood framework is only a very broad model, it is effective for viewing all aspects of livelihoods and in setting risk reduction and hazard vulnerability in the wider vulnerability and livelihoods context (Twigg, 2001:13).

2.9.2 Pressure and release model

The pressure and release model is a simple tool for showing how disasters occur when natural hazards affect vulnerable people (Wisner *et al*., 2004:50). The model identifies a disaster as the outcome of natural hazards such as tsunamis, earthquakes, volcanic eruptions, wild fires, riverine and coastal floods and storms, on one side, and a progression of driving forces which shape the degree of people's vulnerability to these hazards, on the other (Blaikie *et al*., 2005:2). The progression of these driving forces or vulnerability originates with root causes which are shaped by a series of dynamic pressures and can give rise to unsafe conditions (Schilderinck, 2009:27; Cutter *et al*., 2009:4).

Root causes are the most remote influences and can be seen as an interrelated set of widespread and general processes within a society and the world economy (Wisner *et al*., 2004:52). The most important root causes that give rise to vulnerability are economic, demographic and political processes as they affect the allocation and distribution of resources among different groups of people. Root causes also reflect the distribution of power in a society and are connected to the functioning and power of the state (Twigg, 2001:4; Schilderinck, 2009:27). Dynamic pressures are processes and activities operating at different spatial scales that channel the effects of root causes into unsafe conditions (Barnes, 2014:164). These include epidemic disease, rapid urbanisation, current wars and other violent conflicts, foreign debt and certain structural adjustment programmes (Wisner *et al*., 2004:54). The interaction between root causes and dynamic pressures leads to unsafe conditions which are the final expressions of vulnerability (Barnes, 2014:164). Unsafe conditions

are the specific forms in which the vulnerability of a population is expressed in time and space in conjunction with the hazard (Schilderinck, 2009:11). Examples of unsafe conditions include people having to live in dangerous locations, being unable to afford safe buildings, having to engage in dangerous livelihoods or having minimal food entitlements (Twigg, 2001:4).

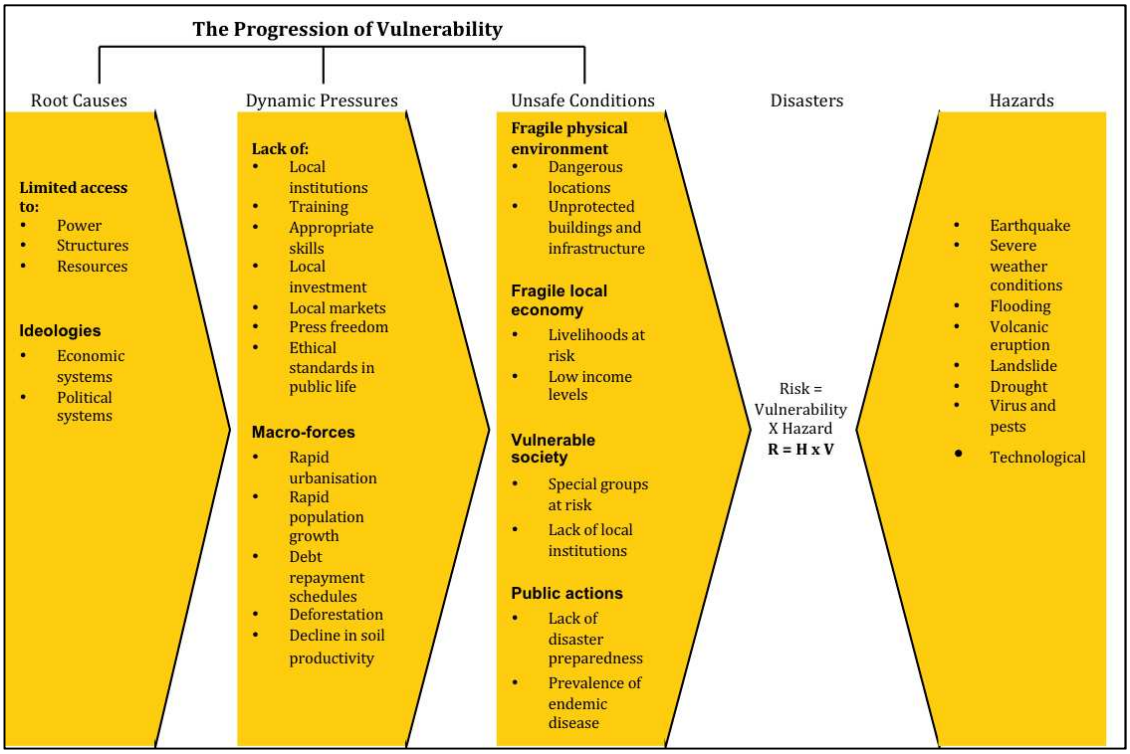

Figure 2.2: Pressure and Release Model: The progression of vulnerability
(adapted from Wisner *et al*., 2004:51)

The release component focuses upon factors that reduce hazard vulnerability (Barnes, 2014:164) and thus conceptualise the reduction of disaster (Wisner *et al*., 2004:50). According to Twigg (2001:4), increasing pressure can come from either side, but to release the pressure, vulnerability has to be reduced. Although reversal of the hazard side of the model is also possible, it does not improve the unsafe conditions, but merely reduces the risk for disaster and can lead to people still living in unsafe conditions (Jordaan, 2006:4). It is therefore important to recognise that in order to release the pressure that causes disasters, the entire chain of causation needs to be addressed and not just the

triggers of the hazard itself or the unsafe conditions of vulnerability (Wisner *et al*., 2004:87).

2.9.3 Access model

The access model is an expanded analysis of the factors presented in the pressure and release model (Wisner *et al*., 2004:50) and is intended to assist in recognising how the various forces identified in the pressure and release model can influence the daily lives of people and groups most affected by disaster risks and vulnerability (Cyr, 2005:4).

The access model is a more magnified analysis of how vulnerability is initially generated by economic, social and political processes and what then happens as a disaster unfolds (Wisner *et al*., 2004:50). As a household's level of access to resources is strongly influenced by its capacity to respond to the impact of hazards, the model explains how unsafe conditions at a household level emerge as a result of processes that allocate resources. These resources can be economic, related to health, or infrastructure, or be information-based (Schilderinck, 2009:27). Therefore, risk and vulnerability of social groups can be minimised by identifying the intervention points through which enhancements in the allocation of additional assets and resources can be made (Cyr, 2005:4).

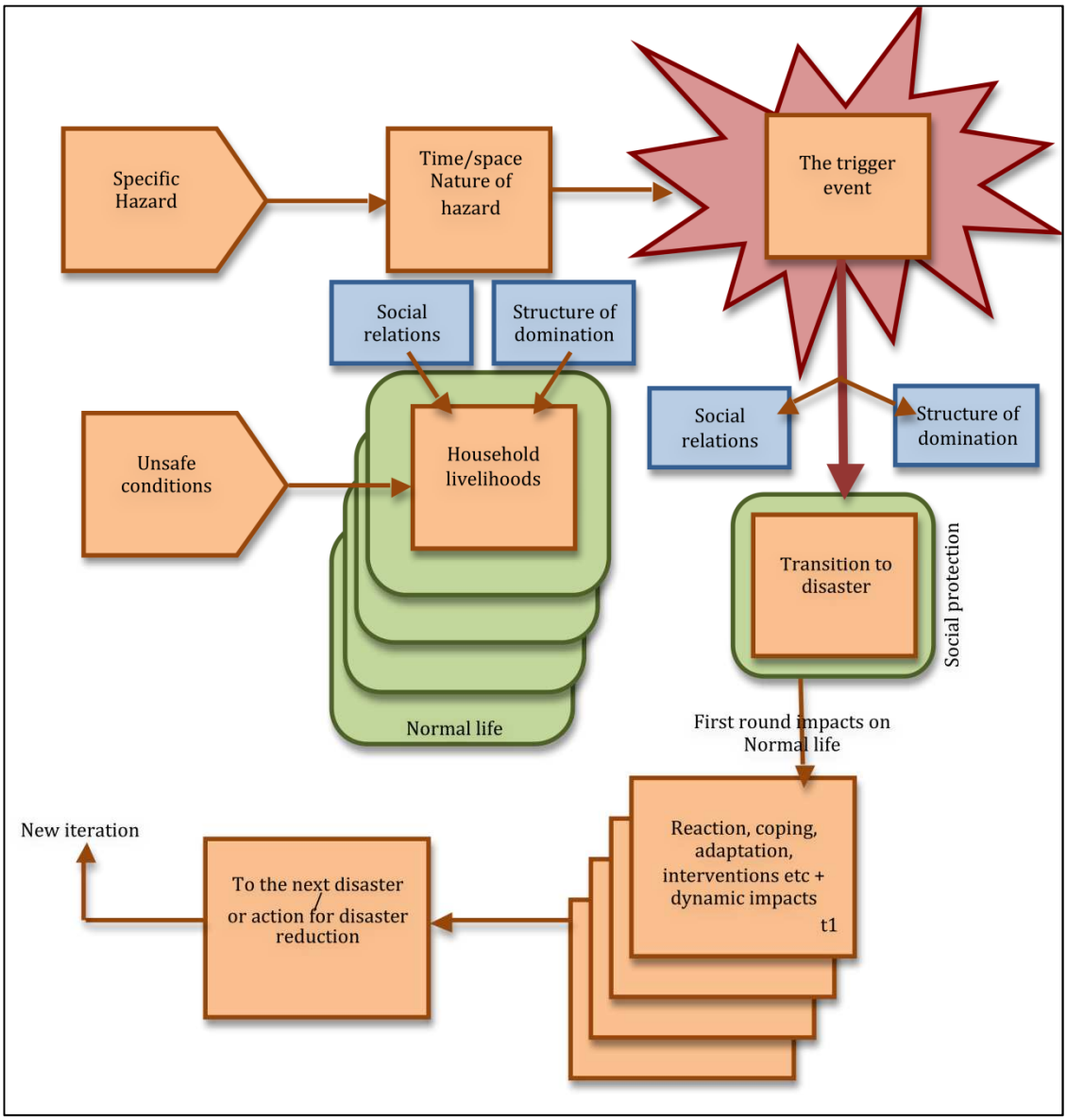

Figure 2.3: Access Model
(adapted from Wisner *et al*., 2004:89)

The pressure and release theory and access theory are valuable because they takes a holistic view of vulnerability and place livelihood strategies at the centre of coping strategies while providing a conceptual framework for looking at livelihoods and vulnerability (Twigg 2001:6).

2.10 CONCLUSION

This chapter explores the relationship between disaster risk reduction and food security in providing background information into the status and current developments on the topic on a global scale. Food security is addressed to include an overview of the food security definition and its components with specific attention to urban environments and food systems. It becomes evident from the discussions in this chapter that food insecurity, especially in Southern Africa, is increased by social, economic and political factors.

The second section of this chapter explores the concepts of poverty and vulnerability and the way these factors are linked with food security. The lack of food security can be seen as both a cause and an effect of poverty and can lead to poverty becoming a vicious cycle, as malnutrition undermines productivity, reduces income, and traps people in poverty, whereas poverty deprives people of access to adequate, good quality food, denying them the nutrition they need to be healthy (ADB, 2012:22).

The chapter concludes by highlighting the importance and relevance of disaster risk reduction and disaster risk management theories to the particular study. The sustainable livelihood framework is introduced in this chapter as an approach to help understand and analyse livelihoods, mainly the livelihoods of the poor. The pressure and release model and access model are also introduced as two complementary theories that explore disaster risk and vulnerability, as the relationships between disaster risk, vulnerability, hazard and coping capacity can be derived from these theories.

Disasters and food insecurity are directly interconnected as disasters create poverty traps that increase the prevalence of food insecurity and malnutrition. Natural hazards have the potential to spoil food and destroy agricultural and food processing infrastructure, assets, inputs and production capacity. Floods,

hurricanes and tsunamis can interrupt market access, trade and food supply, reduce income, deplete savings and erode livelihoods. Drought, plant pests, animal diseases and food contamination can have a direct economic impact by reducing or eliminating farm production, by adversely affecting prices, trade, and market access and by decreasing farm income and employment. Economic crises such as rising food prices reduce real income, decrease food consumption and reduce dietary diversity and access to safe and quality food (FAO, 2013b:3). Disaster risk reduction is therefore a prerequisite for sustainable development and for reducing food insecurity as vulnerable individuals, households and communities and their assets need to be protected from disaster risk in order to become food secure (WFP, 2015a:1).

This chapter has established the core aspects relating to disaster risk reduction and food security and the relationship between these concepts, which will serve as the main analysis tools within the study in order to analyse the situation in South Africa and thus answer the research questions.

CHAPTER 3

URBAN FOOD SECURITY IN THE SOUTH AFRICAN CONTEXT

3.1 INTRODUCTION

This chapter investigates the dynamics of food security in South Africa's urban areas. Firstly, food security in South Africa is discussed. The purpose of this discussion is to provide background information and gain insight into the status of urban food security in South Africa. Household poverty, often considered as being a widespread problem in South Africa, and its impact on urban household food security and household livelihood strategies, are then discussed. In order to understand household poverty in the South African context, poverty measurement with reference to poverty lines is discussed and an overview of the main sources of income in the country, namely salaries, grants and remittances is provided. The major components of food security, consisting of availability, access, utilisation and stability are also discussed in the context of South Africa's urban areas.

The second section of this chapter will investigate other bodies of knowledge that could be potentially relevant to the food security issue. Migration, HIV/AIDS and climate change and the impact of these issues on household food security with specific attention to urban environments, are discussed. South African legislation in terms of policies and development programmes with regard to food security and nutrition is also discussed. The chapter concludes by highlighting several food security challenges relevant in the South African context. These challenges are then addressed in further chapters.

3.2 FOOD SECURITY STATUS IN SOUTH AFRICA

South Africa, on aggregate, is considered to be a food secure country; however, large numbers of households within the country are food-insecure (Ngandu *et al*., 2010:58). A 2012 survey conducted by the South African National Health and Nutrition Examination Survey assessing defined aspects of the health and nutritional status of South Africans with a sample size of approximately 8000 households, found that 45.6% of the population was food secure, while 28.3% were at risk of hunger and 26.0% was food insecure. The largest percentage of participants who experienced food insecurity was situated in urban informal (32.4%) and in rural formal localities. The highest prevalence of being at risk of hunger was also in the urban informal and rural informal areas (Shisana, Labadarios, *et al*., 2014:144).

Food insecurity however, has traditionally been viewed as a rural development problem, and has not received the necessary attention from academics, policy-makers or development agencies as frameworks and solutions that were designed for the rural challenge are often adopted to address the issue for urban areas (Battersby, 2012:143). Another misconception of the food insecurity problem is that it is mainly a problem of food availability whereas the challenge of urban food insecurity is primarily one of access. Household-level access and utilisation issues and not just macro scale availability and production, therefore require consideration (Battersby, 2011:546). A large proportion of the South African population, including working families, lives in poverty (Altman *et al*., 2009a:359) and most South African households depend increasingly on wages and income to access food, and income security is therefore an essential ingredient to address food insecurity in the country (Ngandu *et al*., 2010:58).

South Africa is furthermore facing a very serious, widespread but under-recognised national challenge, namely undernutrition (Altman *et al*., 2009a:359). Undernutrition is the outcome of insufficient food intake,

inadequate care and infectious diseases (Ismail & Suffla, 2013:1) and refers to the lack of sufficient micro- nutrients, such as key vitamins, iron, zinc and minerals. A severe and/or chronic lack of adequate nutrition can manifest in underweight and stunting in children and can lead to irreversible changes in child development, including poor cognitive development, weak educational performance, increased risk of morbidity and impaired immune functions (Altman *et al*., 2009a:350).

3.3 POVERTY AND VULNERABILITY TO FOOD INSECURITY IN URBAN SOUTH AFRICA

Statistics South Africa employs the cost-of-basic-needs approach, including both food and non-food items, to produce three poverty lines to be used for poverty measurement in the country. The approach calculates the minimum amount of money needed to survive, meaning that those who fall below the line live in poverty. These poverty lines are the food poverty line, which is the rand value below which individuals are unable to purchase or consume enough food to supply them with minimum per-capita-per-day energy requirement for good health; the lower bound poverty line, which includes non-food items, but requires that individuals sacrifice food in order to obtain these; and the upper bound poverty line, which include individuals or groups who can generally purchase both food and non-food items, but are still considered to be in poverty (StatsSA, 2015:1). The rand value of each line is updated annually using consumer price index data (StatsSA, 2014a:7) and the rand value estimation for 2014 is R 400 *per capita* per month for the food poverty line, while the lower and upper bound poverty lines are R 544 and R 753 *per capita* per month respectively (StatsSA, 2015:1).

South Africa is characterised by high levels of income poverty and inequality where many households live in a state of chronic poverty and find it difficult to deal with the persistence and interaction of multiple stressors that include

sudden shocks such as unemployment and disasters (StatsSA, 2012a:53) as well as gradual changes such as changes in service delivery and land degradation (Hart, 2009b:363). As a result, poor households often suffer from inadequate or unstable food supplies and are consequently very vulnerable to hunger and food insecurity (StatsSA, 2012a:4). These households often have inadequate access to safety nets, insufficient capital or access to land, and meagre purchasing power (Department of Agriculture, 2002:19). Poor households are also less likely to consume a diet that is sufficiently diverse to allow adequate nutrition, and undernutrition is taking on an increasingly urban character as a result of urban poverty (Drimie *et al*., 2013:7).

Most South African households rely on salaries as a main source of income followed by grants and other sources of income such as remittances (StatsSA, 2014b:14). Provincially, households in Gauteng and the Western Cape are most likely to receive salaries while households in Limpopo and Eastern Cape are more likely to receive grants rather than salaries. Remittances also play an important role as a source of income, especially in Limpopo, the Eastern Cape and Mpumalanga (StatsSA, 2012b:38). Nationally, 64,7% of households reported salaries as an income source to the household; and 45,7% of households reported grants as an income source to the household, taking into account that a specific household can have more than one source of income, whereas 58,4% of households in the country reported salaries/wages/commission as the main source of income, followed by grants (21,6%), other sources (9,1%) and remittances (8,6%) (StatsSA, 2014b:56).

South Africa has a fairly developed social assistance system for children, people with disabilities and older persons. Nearly 16 million South Africans receive social grants and it makes up 15 % of government spending and 3.4 % of GDP (Patel *et al*., 2015:379). The largest cash transfer programmes in the country are the Child Support Grant to the value of R 330 per month as of April 2015, the Disability Grant to the maximum value of R 1,410 per month as of April 2015 and the Older Person’s Grant to the value of R 1,428 per month as

of April 2015 (GroundUp, 2015). The percentage of individuals who benefited from social grants was estimated at 30,2% in 2013 and the percentage of households that received at least one grant was estimated at 45,5% in 2013 (StatsSA, 2014b:31). A large proportion of South Africa's social spending goes towards social grants in order to improve standards of living and redistribute wealth to create a more equitable society (GroundUp, 2015). Although South Africa recently increased the monthly cash value per social grant, these pension and child welfare payment increases covered only a fraction of the higher food costs that occurred as a result of food price inflation in the country over recent years and therefore this form of government support probably brought little relief to families dependent on grants (Jacobs, 2012:2).

StatsSA (2014a:55) announced in their report on Poverty Trends in South Africa that poor households spend on average R 8 485 per annum on food, which accounts for 33.5% of their total annual household expenditure. The report presented poverty and inequality trends based on data collected by Statistics South Africa through the Income and Expenditure Survey conducted in 2005/2006 and 2010/2011, as well as the Living Conditions Survey conducted in 2008/2009. Income poverty is therefore considered a widespread problem in South Africa. It is however unevenly distributed in terms of spread and intensity as the most urbanised provinces, Gauteng and Western Cape, tend to have the lowest percentage of poor households, while the majority of poor households are found in the provinces of Limpopo, Mpumalanga and Eastern Cape, which are predominantly rural areas (StatsSA, 2012a:5). Southern African cities (including Cape Town and Johannesburg in South Africa) however demonstrate strong links between urban poverty and high levels of food insecurity at the household level. Research undertaken in 11 Southern African cities revealed, among other aspects, that poverty and food insecurity in the region are directly correlated and that four out of five poor urban households are food insecure (Ziervogel & Frayne, 2011:5).

Most South African households, including the urban and rural poor, are net purchasers of food and have a high dependency on paid employment to access food (Rangasamy & Nel, 2014:17). Urban and rural households have increasingly become dependent on market purchases for their food supply and many households purchase up to 90% of their food (Baiphethi & Jacobs, 2009:459). Such a dependency on food purchases exposes households to the adverse effects of price fluctuations, which can have a significant impact on the food security of the household (De Klerk *et al*., 2004:32), particularly rising prices of maize and wheat which constitute the staple diet of many poor South African households and poses a serious problem for the urban and rural poor (Altman *et al*., 2009a:347). Food price changes can also contribute to dietary changes leading to less diverse, lower quality diets that are less likely to provide sufficient nutrients and may also have an impact on the food processing industry as it can affect employment and incomes (McLachlan & Thorne, 2009:9; StatsSA, 2012a:4). Additional factors leading to higher food prices include domestic electricity supply constraints, rising oil prices, bio-fuel production, speculation in commodity markets and the power of role players within the food chain, for example, supermarkets, processors and distributors. These factors further exacerbate the problem of household food insecurity (Altman *et al*., 2009a:347). Rising food prices can furthermore spark social unrest, destabilise fragile economies and destroy years of development progress (Drimie & McLachlan, 2013:8).

A number of South African households live in a state of chronic poverty and as a result their vulnerability to hunger and food insecurity is increased. Hunger is generally associated with “not eating enough food” and can therefore be seen as an outcome of inadequate food intake (Altman *et al*., 2009a:350). Vulnerability and food insecurity are both functions of households’ exposure to shocks or gradual changes and their ability to cope with these stressors (Hart, 2009b:375). For example, when a household does not enable accumulation of the assets required to cope with shocks or gradual changes that might occur, these assets will become depleted and so increase the households level of

vulnerability to, and experience of, food insecurity. South Africa's households' vulnerability to hunger has declined over the past decade, decreasing from 23,8% to 11,5% in 2011 (StatsSA, 2012a:55). Although this is still higher than the 10,5% recorded in 2007, before the start of the financial crises, 21,1% of the country's households however continue to experience inadequate or severely inadequate access to food (StatsSA, 2012a:17) and vulnerability to hunger at the household level remains a serious concern.

Urban food security is consequently highly dependent on money and it becomes crucial to focus on the challenges of generating efficient and stable income as a measure for ensuring food security in South African urban areas (Van der Merwe, 2011a:2).

3.4 CHALLENGES FOR ENSURING FOOD SECURITY IN SOUTH AFRICAN URBAN AREAS

South Africa faces a wide spectrum of food security challenges as high levels of poverty, unemployment, inadequate safety nets and unstable household food production, for example, continue to plague the country (StatsSA, 2012a:5). Food insecurity may have several factors which can influence food security as immediate or underlying causal factors (Labadarios *et al*., 2009:7) and it is therefore important that urban food security in South Africa be understood in connection with other developmental challenges (Van der Merwe, 2011b:5). These challenges could include rapid urban development, the HIV/AIDS epidemic climate change, social protection, access to health services, basic infrastructure and nutritional knowledge. Extensive and comprehensive knowledge of the urban context is necessary to allow for long term social protection systems which are critical for addressing food and nutrition security in urban areas (Crush & Frayne, 2010:37).

South African food initiatives and development projects have furthermore tended to focus either on increasing food production or on direct household interventions such as food aid or social safety nets, whereas policy or development initiatives for addressing food insecurity should consider the wider urban food system (Battersby, 2011:558). A review of the multiple national programmes on food security is important in order to provide a coherent and well-coordinated programme with clear targets, beneficiary criteria, exit criteria, monitoring and evaluation frameworks and institutional structures for coordination and accountability (Hendriks, 2014:19). Furthermore, nutrition policies of national and local governments and the programmes of international organisations such as the FAO and the WHO must be researched in order to establish effective, forward-looking legislation for addressing the food security problem in the country (Frayne, Crush, *et al*., 2014:108).

3.4.1 Urbanisation

Urbanisation refers to a complex process of social transformation which affects rural development, agriculture and overall food security (Drescher & Iaquinta, 2002:1). Migration within and towards the Southern African region has changed dramatically in recent decades and evidence suggests that the region is undergoing a rapid urban transition (Crush, 2012:37). Gauteng, as an example, is the smallest, yet most urbanised province of South Africa with a population of approximately 9,5 million people and expected to grow to 14 million inhabitants by 2015 (SACN, 2006:21). Within the province, Johannesburg has become the main destination for migrants from rural South Africa, the Southern African region as well as the African continent (De Wet *et al*., 2008:4).

Urbanisation can occur through natural population increase where urban areas experience higher birth than death rates (Matuschke, 2009:4); rural to urban migration where the effect is a simultaneous reduction in the rural population

and an increase in the urban population (Drescher & Iaquinta, 2002:4); reclassification, where a previous rural settlement becomes classified as urban or an urban area's boundaries are expanded (Satterthwaite *et al*., 2010:2810); and also through temporary cross-border movement within a region, as most international migrants move to cities in other countries that are already highly urbanised (Crush, 2012:37).

Predictions indicate that urbanisation will bring severe challenges to household food security as a result of high rates of unemployment, increasing development of the informal sector, deteriorating infrastructure, overcrowding and environmental degradation, because these issues will bring forth challenges in providing a sufficient food supply to urban residents (Ziervogel & Frayne, 2011:1). As an example, the Gauteng Province produces 618 000 tons of food per annum, whereas a total of 5 193 260 tons are consumed within the province. Gauteng households therefore have to rely heavily on external food sources. In the light of resource prices and constraints, such a food system could face serious shocks (GCRO, 2011:73).

Urbanisation and poverty are therefore two fundamental development challenges in Sub-Saharan Africa and, combined, these conditions increase food insecurity in urban areas where a further outcome of the food insecurity dynamic is widespread malnutrition (Frayne, Crush, *et al*., 2014:101). The relationship between food security and dietary diversity shows that when food insecurity increases, dietary diversity declines and therefore a large number of poor people in Southern African cities are affected by malnutrition and are underweight (Frayne, Crush, *et al*., 2014: 104).

Rural and urban areas in South Africa are directly and indirectly linked through a range of self-provisioning arrangements stemming from agriculture as a means of fighting urban food insecurity and rural poverty through multi-local livelihoods. In addition to these arrangements, temporary migration and cash transfers from urban to rural areas can also be seen as a link between urban

and rural areas (Andersson Djurfeldt, 2015:4). Multi-local livelihoods can be perceived as a spatially extensive form of livelihood diversification, typically, where household members working away from the household contributes in part to the household income (Elmhirst, 2012:146). Multi-local livelihoods can therefore also be cash remittances and food transfers from rural to urban areas (Andersson Djurfeldt, 2015:4). Frayne (2010:305) suggests that the informal movement of rurally produced food to urban households is important to many migrant household economies and is encouraged by the migration and urbanisation process in Southern Africa. Rural-urban remittances, on the other hand, are also an important aspect of migration in South Africa as it supports poorer and less able households and family members. (Atkinson, 2014:45). Most rural households depend heavily on grants and remittances (as discussed in section 3.3 of this chapter), and therefore on linkages to urban areas (Todes *et al*., 2008:9).

3.4.2 Climate change

The links between food security and climate change are complex, as food security not only involves food and its production, but also trade and nutrition, as well as how people and nations maintain access to food over time, often while facing multiple shocks and stresses. (Ziervogel & Ericksen, 2010:525). Climate change is a key concern within South Africa, and the country is likely to experience higher temperatures and less rainfall as a result of it, which will affect the productivity of cropland, leading to changes in food production and international trade patterns (Calzadilla *et al*., 2014:24). These expected long term changes in weather conditions will have serious impacts on the four dimensions of food security, namely, food availability, food accessibility, food utilisation and food system stability (FAO, 2008c:1).

The effect of climate change on food production and the availability of food are likely to have a greater impact on food security as an increase in droughts and floods, for example, can affect production negatively (Ziervogel & Ericksen,

2010:528). Climate change can also lead to changes in seasonality which can result in certain food products being scarce at certain times of the year and these seasonal variations in food supply can have a negative impact on the vulnerability of livelihoods (Ziervogel & Frayne, 2011:12).

Access to food in urban areas is also likely to be impacted by climate change in the form of allocation of food through markets and non-market distribution mechanisms, the affordability of food as well as individual or household preference (FAO, 2008c:23). Food transported from rural areas needs to be allocated to supermarkets and informal markets and if the transportation is impacted upon, accessibility of food products can be compromised (Ziervogel & Ericksen, 2010:528). Allocation choices might also have to be made within the household where a family might reduce the daily amount of food consumed equally among all household members, or allocate food preferentially to certain members of the household (FAO, 2008c:24). Food prices are a direct determinant of affordability and therefore access to food. Climate variability or extreme climate conditions can impact on job opportunities and other means of income, which will in turn affect the ability to buy food (Ziervogel & Frayne, 2011:12).

The types and variety of seed cultivars that can be grown change as climate changes in order to be more appropriately suited to the climate and this has implications for food utilisation. In Southern Africa, for example, people prefer to eat maize rather than sorghum, even though sorghum fairs better than maize when there is less rainfall. People, nevertheless, continue to plant maize despite poor yields that may become even more threatened with future climate change. Climate change and the resulting change in food security can therefore also have an impact on the nutritional intake of household members, especially ill individuals (Ziervogel & Frayne, 2011:12). Adaptation to climate change must therefore factor in the existing and long-term effects of the AIDS epidemic (Drimie & Gillespie, 2010:779). The household's physical infrastructure, like electricity for refrigeration and cooking, can also be

damaged by severe weather events in poorly serviced areas that are more prone to disasters, which in turn will have negative consequences for food and nutrition security for poor urban households and communities (Ziervogel & Frayne, 2011:12).

Food stability can be affected if food prices are not constant. Changes in seasonality brought on by climate change can, for example, lead to certain food products being scarcer at certain times of the year which in turn can result in higher demand for these products at an increased price (Ziervogel & Ericksen, 2010:528). Such an increase in the instability of supply will also most likely lead to increases in the frequency and magnitude of food emergencies which can be difficult to cope with (FAO; 2008c:26).

3.4.3 HIV/AIDS

People living with or affected by chronic illness have less labour, spend more time caring for others, and have decreasing experience and skills (HSRC, 2004:17). Food insecurity in Southern Africa is therefore worsened by the negative impacts of HIV/AIDS on the ability of the active population to produce food (Dube *et al*., 2013:3). South Africa has a generalised HIV epidemic and continues to be home to the world's largest population of people living with HIV (SANAC, 2011a:18). In 2014, an estimated 6.8 million people were living with HIV in South Africa, with 140,000 South Africans dying from AIDS-related illnesses (UNAIDS, 2015). HIV is therefore one of the ten leading underlying natural causes of death in South Africa. According to the General Household Survey, 2013 (StatsSA, 2014c:27), HIV was ranked third as an underlying natural cause of death in 2013, accounting for 5,1% of deaths. The number of deaths due to HIV disease increased by 21,0% between 2012 and 2013.

South Africa's National Strategic Plan on HIV, STIs and TB, 2012-2016 (SANAC, 2011b:25) has identified a list of key populations that are at higher risk for HIV infection. Included in this list are people living in informal

settlements in urban areas which have a higher prevalence than people living in urban formal, rural formal and rural informal areas. Urban informal settlements were also found to have the highest HIV prevalence levels in 2002 as well as in 2005 (SACN, 2006:49). According to the South African National HIV Prevalence, Incidence and Behaviour Survey, 2012 (Shishana, Rehle, *et al*.; 2014:49) there are variations in HIV prevalence in South Africa's metropolitan municipalities. eThekwini Metropolitan Municipality in KwaZulu-Natal and Ekurhuleni Metropolitan Municipality in Gauteng have the highest HIV prevalence, followed closely by Buffalo City Metropolitan Municipality in the Eastern Cape. The City of Tshwane Metropolitan Municipality and the City of Johannesburg Metropolitan Municipality have an HIV prevalence that is slightly lower than the national average. Nelson Mandela Bay Metropolitan Municipality, in the Eastern Cape, and Mangaung Metropolitan Municipality, in the Free State, have HIV prevalence below the rest of the Metros as well as the national average, and the City of Cape Town Metropolitan Municipality has the lowest recorded HIV prevalence. This is then also an indication that there are variations in HIV prevalence in South Africa's provinces.

De Waal and Whiteside (2003:1) hypothesised the "new variant famine" and argued that HIV/AIDS has created a new category of highly vulnerable households, namely those suffering adult morbidity or mortality. De Waal and Whiteside (2003:3) argue that the generalised HIV/AIDS epidemic in Southern Africa helps to explain why many households are facing food shortage, as well as the limited recovery from shocks to household livelihoods. They established four key indicators to examine the "new variant famine" hypothesis to include, firstly, household-level labour shortages due to adult morbidity and mortality, and the related increase in numbers of dependants. The most economically productive and socially reproductive household members are of the age that are the most likely to be HIV positive. The illness or death of able-bodied individuals will lead to household-level labour shortages and more dependants like the elderly, children and the sick who require care and support (Naysmith, 2009:6). The second indicator is the loss of assets and skills due to adult

mortality (De Waal & Whiteside, 2003:3). The children left behind when their parents die may not have acquired enough skills to perform some key agriculture and economic activities necessary for their survival (Loevinsohn & Gillespie, 2003:21). Thirdly, there is the burden of care for sick adults and children orphaned by AIDS, which can result in major expenditure and diversion of labour (De Waal & Whiteside, 2003:6). The last indicator is the vicious interactions between malnutrition and HIV, where HIV/AIDS heightens vulnerability to food insecurity, which in turn may heighten susceptibility to HIV infection (Gillespie *et al*., 2004:2). A lack of access to adequate foods, leads to a supressed immune system, increased risk of mother to child transmission and decreased resistance to HIV, whereas infection with HIV itself reduces the effectiveness of nutrient absorption and utilisation by the body (Crush, Drimie, *et al*., 2011:349).

According to Naysmith (2009:1) the hypothesis does not suggest HIV/AIDS is the sole cause of increasing food insecurity in Southern Africa, but rather that the "new variant famine" hypothesis complements other theories of famine, in that the HIV/AIDS burden can contribute to food insecurity by exacerbating existing social, economic and political problems within a society. HIV/AIDS linked with other problems, such as hunger, can therefore be a lethal combination (Bond, 2006:182).

Further critique on De Waal and Whiteside's article includes the rural focus of their hypothesis. Ellis (2003:17) mentions that HIV is also an urban problem and that deep rural areas could be less affected than urban areas, as urban populations must also deal with the associated costs and loss of assets that the disease ultimately causes. A study conducted during 2013 (Steenkamp *et al*., 2014:277) in the Nelson Mandela Bay and Buffalo City districts in order to determine which socio-economic and demographic factors are related to HIV status in informal settlements, concluded that the observed levels of HIV prevalence are highest in females, the unemployed participants without matric, and food insecure individuals living in these areas. These groups may then be

more vulnerable to participation in high risk behaviour such as transactional sex in order to address household food security or hunger, and therefore food insecurity and hunger was positively associated with HIV status in urban informal settlements. Núñez Carrasco *et al*. (2011:108) explored the inter-linked livelihood systems of migrant households in Johannesburg, taking into account that most of the migration in Southern Africa is from rural to urban and peri-urban areas, and that HIV infection is more prevalent in urban areas within the region. They argue that remittances in money, food and other goods are the productive dimension of the interlinked livelihood system and findings indicated that urban livelihood strategies are important components of livelihoods elsewhere as city dwellers tend to send money, food and other goods to households in rural areas. Households in the City however did not report receiving money, food or other goods from outside Johannesburg. Should an urban migrant however becomes sick, they may not be able to send remittances home and this places stress on their ability to contribute to the household. Such a person might then require material resources and care, which often comes from household members in the rural household of origin. Such physical and emotional care can then be seen as the reproductive dimension of the inter-linked livelihood.

All of these aspects stretch the coping strategies of poor families and communities, as food insufficiency is consistently associated with high risk for HIV infection, which in turn negatively affects livelihoods (Kalichman, 2012:939).

3.5 SOUTH AFRICAN FOOD SECURITY LEGISLATION AND INTERVENTIONS

The chapter on the bill of rights in the constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has the right to have access to sufficient food and water and furthermore that children have the right to basic

nutrition, shelter, basic health care services and social services (RSA, 1996). South Africa has attempted several food security programmes since 1994; however, a lack of coordination by different departments in all spheres of government led to the inability of the departments to achieve the major objective of ensuring household food security and poverty reduction (Mwale *et al*., 2012:2). The Integrated Food Security Strategy for South Africa (IFSS) serves as an example.

The IFSS was approved by cabinet in 2002 to integrate the many previously isolated policies attempting to address the challenge of food and nutrition insecurity in South Africa (*Chopra et al*., 2009:28). The ultimate goal of the strategy was to develop and facilitate diverse food security programmes within South Africa as part of a more holistic response to hunger and malnutrition (Drimie & Ruysenaar, 2010:330). The strategy defined food security as "physical, social and economic access to sufficient, safe and nutritious food by all South Africans at all times to meet their dietary and food preferences for an active and healthy life" (Department of Agriculture, 2002:6). The strategic objectives of the IFSS were to increase household food production and trading, to improve income generation and job creation opportunities, to improve nutrition and food safety, to increase safety nets and food emergency management systems, to improve the analysis and information management system, to provide capacity building and to hold stakeholder dialogue (McLachlan & Thorne, 2009:26). Koch (2011:1) argues that, while the IFSS is an excellent strategy on paper and a relevant framework for different stakeholders, it lacks implementing power in reality and is therefore not used to its full potential. Constraints that have limited the success of the IFSS include the lack of a specific department assigned the responsibility of addressing food security in a comprehensive fashion, as the focus has been on a prosperous agricultural sector rather than assuring "food security for all", the coordination of food security has been tasked to a directorate that does not have much administrative capacity, the lack of dedicated funds for government to spend on food security on all administrative levels, the absence of a Food

Security Policy prohibits government from providing a clear line of authority and that stakeholder dialogue with civil society, and within government has been minimal (McLachlan & Thorne, 2009:27; Chopra *et al*., 2009:28; Drimie & Ruysenaar, 2010:331).

The integrated food and nutrition security policy, the first National Policy on Food and Nutrition Security was approved by cabinet on 18 September 2013 and was the collaborative work of the Department of Agriculture, Forestry and Fisheries and the Department of Social Development. The Policy is an over-arching policy framework which provides a structure for the many initiatives around food security. It is underpinned by two programmes, namely, the Household Food and Nutrition Security Strategy, under the leadership of the Department of Social Development and the Fetsa Tlala Food Production Initiative which is under the leadership of the Departments of Agriculture, Forestry and Fisheries (Department of Communications, 2014). The strategic goal of the National Food and Nutrition Security Policy is to ensure the availability, accessibility and affordability of safe and nutritious food at national and household levels (Department of Agriculture, Forestry and Fisheries, 2013:6). The policy was however developed and approved without public consultation and the document is embargoed until gazetted (Hendriks, 2014:8) Given the diverse interpretation of food security and the vague understanding of what a policy is, it is unlikely that the new policy will provide a comprehensive policy framework for food security in the country and unless it provides a comprehensive and enforceable legal framework for implementation of food security and nutrition programmes, it will fail to address the current crisis (Hendriks, 2014:19).

3.6 CONCLUSION

This chapter considers the dynamics of urban food (in)security in South Africa, analysed in terms of relevant interpretive frameworks. Although the country is

considered to be food secure at national level, large numbers of households within the country are food-insecure, especially households situated in urban informal areas. Two misconceptions about food security become evident, firstly that food security is mainly a rural problem and secondly that it is mainly a problem of food availability (Battersby, 2011:546). Poverty is considered a widespread problem in South Africa and the urban poor find it difficult to deal with shocks such as unemployment and disasters, which place severe pressure on urban households to meet their basic household needs. Another serious problem faced by the urban poor, is that of undernutrition as a result of insufficient food intake to meet nutrient requirements. Undernutrition or malnutrition can manifest in underweight and stunting in children.

Further shocks and stresses to household food security include rising food prices, rapid urbanisation, climate change and HIV/AIDS. Urban households have increasingly become dependent on market purchases for their food supply, and rising food prices can have a significant impact on the food security of a household. Urbanisation may bring severe challenges to household food security as a result of high rates of unemployment, increasing development of the informal sector, deteriorating infrastructure, overcrowding and environmental degradation. Climate change has the ability to impact on urban food security if supply chains are disrupted, market prices increase, assets and livelihood opportunities are lost, and human health is endangered as a result of it (FAO, 2008c:1). HIV/AIDS not only undermines food security through its impact on incomes and food purchasing power, but also affects different household livelihood strategies negatively (HSRC, 2004:17).

Even though the country's constitution states that everyone has the right to have access to sufficient food and water, several challenges exist to provide food security at the household level, especially in informal urban areas. South Africa is in need of a food security policy that will ensure the availability, accessibility and affordability of safe and nutritious food at national and household levels. However, existing and past local and global programmes

and legislation must be researched in order to establish effective, forward-looking policies for addressing the food security problem in the South Africa.

Chapter 4 consists of a discussion of the usefulness of approaching food security/hunger in urban South Africa from a disaster risk reduction perspective.

CHAPTER 4

APPROACHING FOOD SECURITY IN URBAN SOUTH AFRICA FROM A DISASTER RISK REDUCTION PERSPECTIVE

4.1 INTRODUCTION

This chapter considers the usefulness of approaching food security/hunger in urban South Africa from a disaster risk reduction perspective. Improving disaster risk reduction and disaster preparedness require first and foremost the identification and assessment of various vulnerabilities of societies, their economy, environmental resource base, and their institutional structures. It is therefore important to ask “who and what is vulnerable?”, “vulnerable to what?” and “what circumstances and context shape the daily life of the affected people or communities?” in order to develop methods and practical tools for the implementation of disaster risk reduction strategies (Birkmann & Wisner, 2006:7). Appropriate and effective disaster risk reduction strategies can then be implemented as disasters can quickly turn into a food and nutrition crisis for food insecure communities, which can take several years to recover from (WFP, 2015a:1).

This chapter implements the viewpoint that access to food is the biggest challenge of urban food insecurity in South Africa and rising food prices and food waste are discussed in this context, both from a national and international point of view.

Development studies conducted in urban South Africa that incorporated the sustainable livelihood approach and other vulnerability theories are discussed and the chapter concludes with a discussion of current programmes and

activities implemented by certain South African metropolitan municipalities in order to address food insecurity in their municipal areas.

4.2 RISING FOOD PRICES, FOOD WASTE AND ADAPTATION TO CLIMATE CHANGE

As discussed previously the challenge of urban food insecurity is primarily one of access to food (Battersby, 2011:547; Frayne & McCordic, 2015:1). Poverty stricken households lack money to buy food and are constrained by the inability to secure employment or to generate income. These households typically consist of few income-earners and many dependents, which make them especially vulnerable to economic shocks (StatsSA, 2012a:5). When these households' livelihood strategy does not enable the household to prepare for future shocks or gradual changes through the accumulation of resources, households will become more vulnerable to severe food insecurity (Devereux; 2006:8).

4.2.1 Rising food prices

High food prices are one of the main causes of food insecurity and food emergencies as the poor find themselves unable to buy the food necessary to satisfy their dietary needs (Taylor, 2013:761). Urban and rural households have increasingly become dependent on market purchases for their food supply and many households purchase up to 90% of their food (Baiphethi & Jacobs, 2009:459). Such a dependency on food purchases exposes households to the adverse effects of price fluctuations, which can have a significant impact on the food security of the household (De Klerk *et al*., 2004:32), particularly rising prices of maize and wheat, which constitute the staple diet of many poor South African households and poses a serious problem for the urban and rural poor (Altman *et al*., 2009a:347).

Global hunger was worsened by the steep increase in global food prices between 2005 and 2008 (Mittal, 2009:1; OECD, 2008:2) and the world was facing the highest food price levels in 30 years and a global food insecurity crisis (FAO, 2009:6). World prices of many staple food commodities such as wheat, coarse grains, rice and oilseed crops nearly doubled during this period (OECD, 2008:2). These food price increases affected the low-income groups within the population, especially the urban and rural poor who depend on the market to access food products (Mittal, 2009:1), since food makes up a larger component of the poor's consumption basket. (Rangasamy & Nel, 2014:17).

There is however no single explanation for the soaring food prices during this period. Mittal (2009:3) argues that several factors have contributed to the increased food prices, including a decline in the growth of agricultural products, a decline in global grain stocks, higher energy prices which raised production costs and an increased demand from the emerging economies. The FAO (2009:15) also contributes the food price increases to a high demand for certain agricultural products as feedstocks for biofuel production, such as maize for ethanol. Furthermore, high oil prices had a direct impact on the costs of agricultural production and prices, and another explanation is the rapid economic growth in certain emerging economies, such as China and India, which resulted in a greater demand for food, especially for livestock products, which generated increased cereal and oilseed demand for feed. South Africa furthermore continues to be plagued by steep food and fuel prices, high energy tariffs and increasing interest rates, and these unfavourable conditions place severe pressure on ordinary citizens already struggling to meet their basic household needs (Labadarios *et al*., 2009:11).

The long term impact of increased food prices is furthermore a challenge on its own, as food price shocks can be persistent and therefore influence food inflation as well as overall inflation (Walsh, 2011:19). Food price movements can affect headline inflation directly as it contribute to general consumer price inflation through its share in the consumption basket as well as indirectly

through its impact on non-food inflation (Rangasamy & Nel, 2014:18). Food price shocks also do not usually receive specific attention in policy formulation, as it is wrongly perceived as a temporary shock (Rangasamy & Nel, 2014:16). According to Crush and Frayne (2011:530) there is evidence that rising food prices affect the urban poor more seriously than the rural poor, a situation which is also never fully acknowledged by governments.

Rising food prices can furthermore spark social unrest, destabilise fragile economies and destroy years of development progress (Drimie & McLachlan, 2013:224). In South Africa evidence shows that food prices are strongly associated with observed periods of extreme public violence. Bar-Yam *et al*. (2013:6) argue that there is a link between the 2007/2008 increase in global food prices and South Africa's xenophobic riots in 2008, which have been attributed to anger towards foreigners competing for limited resources and aggravated by high food prices. They also show the connection between the mining-sector strikes in 2012 and the drought in the USA during the same period, which led to a new increase in food prices. The mine workers' demands included significant wage increases as they claimed that they could not provide basic necessities, such as food for themselves and their families. These mine worker riots coincided with both record global maize prices and record high prices for basic food items in South Africa (Bar-Yam *et al*., 2013:6).

Food price changes can also contribute to dietary changes leading to less diverse, lower quality diets that are less likely to provide sufficient nutrients and may also have an impact on the food processing industry as it can affect employment and incomes (McLachlan & Thorne, 2009:9). Temple and Steyn (2011:507) conducted research on the cost of a healthy diet in South Africa and found that on average, the healthier diet costs 69% more than a typical South African diet, which means that a healthy diet is unaffordable for the large majority of the South African population.

Additional factors leading to higher food prices include domestic electricity supply constraints, speculation in commodity markets and the power of role players within the food chain, for example supermarkets, processors and distributors. These factors further exacerbate the problem of household food insecurity (Altman *et al*., 2009a:347).

4.2.2 Food waste

Large quantities of produced food are wasted along the distribution chain as well as by consumers and not only does food waste have a negative impact on the environment, but it also has an important ethical dimension, as global hunger is a reality (Williams *et al*., 2012:141). A considerable amount of energy and water is furthermore associated with discarding food as the growing, processing, packaging transporting and preparing of food are water and energy intensive. (Gulati *et al*., 2013:160).

The European Commission (2015) define food waste as “being composed of raw or cooked food materials and includes food loss before, during or after meal preparation in the household, as well as food discarded in the process of manufacturing, distribution, retail and food service activities. It comprises materials such as vegetable peelings, meat trimmings and spoiled or excess ingredients or prepared food as well as bones, carcasses and organs”. Nahman and De Lange (2013:2493) provide a broader definition to include losses that arise before food reaches the end-user (pre-consumer food losses), and food that is discarded by consumers themselves (post-consumer food waste).

Nahman *et al*. (2012:2152) investigated the cost associated with loss of a potentially valuable food source, and with disposal of organic waste to landfill in South Africa, and found that the estimated cost to society associated with these types of food waste related problems are approximately R 21.7 billion per annum. This investigation was extended by assessing the cost of edible

food waste throughout the value chain in South Africa (Nahman & De Lange, 2013:2449). This research was based on the value-added prices of a range of representative commodities throughout their respective value chains and the estimated cost of the food waste added up to R 61.5 billion per annum. The authors further extended their research by estimating the costs associated with inedible food waste in the country (De Lange & Nahman, 2015:168). These costs were based on ”opportunity costs” in terms of the value foregone by not recovering this waste for use in downstream applications, such as energy generation or composting. These opportunity costs were estimated at R 6.4 billion per annum. When added to the results of the first two studies (with all values updated to 2013 prices), the total cost of food waste in South Africa amounted to R 75 billion per annum, which is equivalent to 2.2% of South Africa’s 2013 GDP.

South Africa wastes more than 9 million tonnes of locally produced food every year, which makes up 31.4% of all the food produced in the country annually. The relative contribution of each stage in the value chain to total food waste generated in the country adds up to 26% during agricultural production, followed by 25% during processing and packaging, 24% during post harvest handling and storage, 20% during distribution and 5% during consumption (Oelofse, 2013).

Graham-Rowe (2014:21) highlighted specific factors that may motivate household food waste minimisation to include the financial rewards of reducing household food waste and emphasising the fact that reducing food waste is the “right” thing to do. It is also suggested that people may need to be trained in food management skills to empower them to keep household food waste to a minimum. Alternative waste treatment technologies should be considered, where food waste cannot be avoided. For example, waste from food processing can be used as an input in the production of energy or compost. It is also a source of valuable, functional compounds such as antioxidants (Oelofse et al., 2013:1).

4.2.3 Adaptation to climate change

As discussed in Chapter 3, the links between food security and climate change are complex. South Africa is likely to experience higher temperatures and less rainfall as a result of climate change, which will affect the productivity of cropland, leading to changes in food production and international trade patterns (Calzadilla *et al*., 2014:24). The effect of climate change on food production and the availability of food are likely to have a greater impact on food security as an increase in droughts, for example, can affect production negatively (Ziervogel & Ericksen, 2010:528).

Water is a fundamental natural resource and is indispensable to life. South Africa is located largely in a semi-arid part of the world, and as a result its water resources are scarce. Although renewable, water is a finite resource, which requires careful management and protection (GDACE, 2004:51). South Africa is ranked the 35th driest country in the world. The average rainfall in the country is 450 mm per year, well below the world average of 860 mm per year (SAPPI, 2014:42) and more than 50% of South Africa's water resource is used for agricultural purposes (Benhin, 2006:11). The country is on the threshold of the internationally used definition of water stress. Within a few years the population growth, developing economy and urgent need to supply water to the millions of people will take the country below this level. More water will be needed than could be delivered at a given time and place (Thompson, 2006:7).

The most important factor limiting agricultural production in South Africa is the availability of water and commercial farming as well as subsistence farming may be affected by less availability of water as a result of climate change. (Benhin, 2006:11). As a means to adapt to climate change and in effect be more resilient to droughts, emphasis must be placed on solutions for water management in food production. Solutions include investment in irrigation schemes, rainwater harvesting and planting of crop varieties which have been proposed as alternatives to South Africa's food insecurity challenge.

The water scarcity caused by low and erratic rainfall and high evaporative demand in South Africa limits dryland crop production in most of the country and irrigated agriculture presents an alternative for increased food production (Van Averbeke *et al.*, 2011:797). The South African Government has prioritise and invest significantly in irrigation establishment, rehabilitation and revitalisation as a result of the potential of smallholder irrigated agriculture to enhance food security and alleviate rural poverty (Sinyolo et al., 2014a:145). Van Averbeke *et al.* (2011:797) defines an irrigation scheme "as an agricultural project involving multiple holdings that depend on a shared distribution system for access to irrigation water and, in some cases, on a shared water storage or diversion facility".

Mutiro and Lautze (2015:180) examined existing literature on irrigation schemes in Southern Africa in order to determine the proportion that can be considered successful. Success or failure was determined according to five criteria for each scheme in their data set to include economic internal rate of return (EIRR) or economic rate of return (ERR), gross margin, net income, yield and area actually irrigated/ area equipped for irrigation. They found that 59% of irrigation schemes in Southern Africa have succeeded, that success rates have increased over time and that the levels of success identified trough their review, validate calls to increase the irrigated area in Southern Africa. Van Averbeke *et al.* (2011:806) also suggests that there is evidence that smallholder irrigation schemes have contributed positively to rural livelihoods and poverty alleviation in parts of the country that are most disadvantaged. Sinyolo *et al.* (2014a:145) conducted a study aimed at providing empirical evidence and systematic quantitative analysis of the impact of smallholder irrigation on household welfare using the Tugela Ferry irrigation scheme as an empirical example. They used a sample of 251 farmers and found that the the welfare of the irrigators was better than that of non-irrigators and that smallholder irrigation plays an important role in rural poverty reduction. However, even though smallholder irrigation access reduces poverty among farmers, it is not enough on its own to eradicate poverty. The study concluded

that government investments in smallholder irrigation for poverty reduction are justified (Sinyolo *et al.*, 2014a:145). The same authors investigated the determinants of water security in the Tugela Ferry Irrigation Scheme , and how this water security level subsequently affects the farmer's household food security level. In this instance water security refers to access by the irrigating households to sufficient and reliable water to meet the agricultural needs and their ability to assert the water rights against other parties. A random sample of 185 irrigating households was interviewed and the results indicated a strong positive relationship between household water security and food security and demonstrated that higher maize yields are achieved by the relatively water secure farmers. The study further recommends that in addition to investing in the physical irrigation scheme and irrigation participation, priority should also be placed in ensuring household water security (Sinyolo *et al.*, 2014b:483).

Although smallholder irrigation schemes as discussed typically refer to rural agriculture and food production, similar practices can be incorporated in urban and peri-urban areas. The FAO (2015a) suggests that locally-adapted small scale irrigation and plant production methods and schemes are possible solutions to save water in urban and peri-urban agriculture. Van Averbeke (2007:339) conducted a study in five informal settlements of Atteridgeville, Pretoria which involved a pilot study, a household survey and multiple case studies using participants in the different types of urban farming projects as units of data collection and analysis. In terms of irrigation, the study found that the prevailing practice was supplementary rather than full irrigation as home gardens were irrigated using pipes that were connected to the stand pipes or by carrying water in buckets filled from stand pipes. The key constraints in home gardening were limited access to land followed by limited access to water. As a result of urban farming not being considered when settlement in the study area was planned. Greywater is furthermore used to supplement irrigation water as a result of seasonal water restrictions in many parts of the country, and perennial poverty in low-income settlements. Greywater is used on an informal basis in urban gardens in times of drought, as well as in food

gardens in lower-income informal, peri-urban and rural areas. Greywater irrigation holds the potential to contribute significantly to food security in poor settlements by providing a source of irrigation water for cultivating crop plants (Rodda *et al.*, 2011:727). Low cost water-savings technologies such as drip irrigation can increase water efficiency as well as allowing safe use of low quality water resources. Drip irrigation infrastructure is easily manufactured from existing local products. Porous ceramic containers can be used as well as pipes with holes in which water is dripped onto the soil. Drip irrigation practices offer the opportunity of spot irrigating and fertilizing when using wastewater, often utilising a third of the water used in conventional localised irrigation schemes (FAO, 2015a).

4.3 APPROACHES TO DISASTER RISK REDUCTION IN SOUTH AFRICA

Disaster risk in an urban context is largely an outcome of unsustainable development practices or aggravated by urban development and it is therefore important to understand the processes that shape urbanisation and how risk is created or increased to hazards (Ngie, 2012:23). A number of development studies conducted in South Africa incorporated the sustainable livelihood approach and other vulnerability theories in order to help understand and analyse livelihoods and explore the relationships between disaster risk, vulnerability, hazard and coping capacity. These studies provide valuable information and guidelines for future research.

Mazibuko (2013:173) demonstrates the effectiveness of the sustainable livelihoods approach in development. He uses the apartheid era South Africa as an example to illustrate how institutions can suppress development instead of supporting it and as a result contribute to underdevelopment. In referring to the forms of capital that define the sustainable development approach, he explains that during apartheid the black African population received inferior

education as a result of The Policy of Bantu Education and therefore human capital was heavily controlled. Furthermore, financial assets were restricted as wages for black African people were highly controlled under the Wages Determination Act and the 1913 Land Act restricted the indigenous African population to the 13% marginal land in the former homelands. Since they could not own this land, they did not have access to natural assets. Physical assets were also restricted as ownership of livestock was restricted and limited residential areas were provided in terms of the betterment scheme. This forced people to live in clustered areas and to settle on land used for food production, resulting in the threat of food insecurity. Different racial groups were also, by law, not allowed to interact except at the level of employment and thus social capital was badly affected as people could not benefit from each other's life experiences.

Magidimisha *et al*. (2013:110) used the sustainable livelihoods approach to further investigate the nature of urban agriculture practiced in low-income residential areas of cities in South Africa and explored urban agriculture as one of the survival strategies among the urban poor in Durban's KwaMashu residential area. They investigated livelihood assets required for, risks associated with, and government involvement in urban agriculture in the study area. They found that urban agriculture was mostly practiced through individual initiative and did not receive much support from the local government. Risks related to urban agriculture in the area were mostly associated with lack of rights and security as farmers were mostly tenants and not landowners. The greatest challenge was natural capital in the form of access to land to practice farming as agriculture was not then considered an urban land use activity.

Thornton (2008:253) investigated the importance of urban and peri-urban agriculture as a livelihood or survival strategy in households that practiced these types of agriculture in Grahamstown and Peddie in the Eastern Cape. He used the sustainable livelihood approach in his research to explore the

livelihood assets that existed for the urban poor to earn a livelihood. The research proved that the majority of poor households relied on social grants to purchase food and that home gardening activities only provided a measure of subsistence in some extreme examples.

Ward and Shackleton (2015:83) examined how livelihood strategies and income changed along the rural–urban continuum of two South African towns, Queenstown and Phalaborwa. They implemented the sustainable livelihoods framework with emphasis on the various livelihood assets to specifically depict livelihood portfolios and used the household as the unit of measurement and analysis. They found that livelihoods were not necessarily bound by a single strategy, but relied on a number of cash income and agrarian/wild natural resource-based strategies within a single household. The use of natural resource was not only restricted to rural settings, but was present throughout the continuum. The study highlighted the valuable contributions that natural resources can make to poor households and recommended that these natural resources should not be overlooked in larger poverty alleviation strategies, particularly in countries where poverty is widespread.

Viljoen *et al.* (2012:90) conducted a study to determine the factors influencing decisions by households in peri-urban and rural communities to adopt or reject various rainwater harvesting techniques. The study was carried out in the Thaba Nchu and Amathole District, in the Free State and Eastern Cape provinces, respectively. The core of the research focused on the different capitals (natural, physical, financial, human and social) of the sustainable livelihood framework. They found that the more the household have access to relevant livelihood assets, the better the household will be positioned to take advantage of a new technology. The study concluded that all five capitals proved very important for the sustainable adoption of selected rainwater harvesting and conservation practices and techniques, although each of the capitals must be evaluated on its own as well as in conjunction with each other.

Thinda (2009:4) conducted a community based hazard and vulnerability risk assessment in Lusaka informal settlement near Mamelodi within the City of Tshwane Metropolitan Municipality using the pressure and release model as a simple tool for showing how disasters occur when natural hazards affect vulnerable people. The study made use of a community survey to identify the root causes, dynamic pressures, unsafe conditions and potential hazards within the area and the community and provided mitigation measures to address these issues. The study found that the participation and involvement of the community in the risk assessment process could reduce hazards and vulnerabilities by sharing knowledge and raising awareness to build disaster resilient communities.

Mgquba (2002:27) investigated the physical and human dimensions of flood risk in Alexandra Township in Johannesburg. The study used the pressure and release model to examine the root causes, dynamic pressures and unsafe conditions of severe flooding of the Jukskei River in the township which heightened the vulnerability and associated risk of poor local communities living in the floodplain. The study found that the impact of the floods was a result of social as well as physical risk factors.

4.4 CURRENT DISASTER RISK REDUCTION ACTIVITIES AND PROGRAMMES

A variety of organisations, agencies and government institutions, both national and international commit to ensuring food security. A brief discussion of the most prominent international agencies and an overview of four metropolitan municipalities in South Africa and their contributions towards fighting hunger and poverty in their respective municipal areas are discussed in this section. National food security legislation and interventions were discussed in chapter 3 and are recapped in chapter 5.

The WFP Policy on Disaster Risk Reduction and Management, approved in 2011, focuses "…on building the resilience and capacity of the most vulnerable people, communities and countries, by working to ensure food and nutrition security while reducing disaster risk and protecting and enhancing lives and livelihoods" (WFP, 2012:2). The WFP is part of the UN system and is the world's largest humanitarian agency fighting hunger worldwide (WFP, 2015b). During 2010 more than 50% of the agency's programmes addressed the risks of disasters and their impacts on food security, reaching approximately 80 million people (WFP, 2012:2).

The FAO's three main goals are "the eradication of hunger, food insecurity and malnutrition; the elimination of poverty and the driving forward of economic and social progress for all; and, the sustainable management and utilisation of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations" (FAO, 2015b). The FAO Disaster Risk Reduction for Food and Nutrition Security Framework Programme promotes disaster risk reduction activities with the goal to enhance the resilience of livelihoods against threats and emergencies to ensure the food and nutrition security of vulnerable farmers, fishers, herders, foresters and other groups that are at risk (FAO, 2011:18). The FAO's resilience strategy is further based on four pillars namely, "enabling the environment" to incorporate institutional strengthening and governance of risk and crisis in agricultural sectors; "watch to safeguard" to include information and early warning systems on food and nutrition security and transboundary threats; "applying risk and vulnerability reduction measures" including the protection, prevention, mitigation and building livelihoods with technologies, approaches and practices across all agricultural sectors, and "preparedness for and response" to crises in agriculture, livestock, fisheries and forestry (FAO, 2015b).

The City of Tshwane Metropolitan Municipality stated in its 2013/2014 annual report that sustainable, safer cities must be ensured and social development integrated as a strategic objective with food security and food banks as a focus

area (City of Tshwane, 2014:22). The report revealed that especially women have benefitted from projects supported by social workers within the Community Development and Empowerment Subsection. Initiatives were supported in different regions to alleviate poverty, create job opportunities and provide food security and skills development (City of Tshwane, 2014:160). Furthermore, 2144 people also benefitted from food banks in all regions of the Municipal area during this period (City of Tshwane, 2014:163). The Tshwane Vision 2055 was launched in 2013 with the purpose of providing the City of Tshwane with a broad development logic to guide the City's intervention and programme decision-making process over the next four decades. The City acknowledges that ensuring resource security for energy, water, land and food remains a challenge for South Africa and the City of Tshwane (City of Tshwane, 2013:123). The Tshwane Vision 2055 draws from the NDP 2030 and places a lot of emphasis on land reform as a major factor to make land available for sustainable development through food agriculture, infrastructure development and job creation. The City has ample land available for agricultural production and therefore opportunities to increase the current agricultural output for the benefits of the community in order to deal effectively with the challenges of low food security, exist. However, to achieve this, aggressive land reform and land acquisition are required, as the process thus far has been slow in benefitting the majority of the poor (City of Tshwane, 2013:171). The City of Tshwane and its partners intend to develop the agriculture sector over the next four decades to include food security by 2020, intensify urban agriculture through use of low cost technologies by 2030, maintenance of agriculture infrastructure by 2040 and sustainable food security by 2050 (City of Tshwane, 2013:174). The promotion of urban agriculture over the next few years will therefore contribute to greater food security that further promotes healthy living.

The City of Johannesburg Metropolitan Municipality's 2013/2014 annual report also states that food security is a major challenge in the City. It is estimated that as many as 42% of poor households in the Municipal area are affected by

food insecurity and that the poor are particularly at risk given the high proportion of income used for food (City of Johannesburg, 2014:42). In order to address this issue, the City developed a programme to define, identify and rank food insecurity areas and provide people with food through a food bank system. A Food Empowerment Zone was also established for emerging farmers, who received business management skills training, where land has been cultivated, fenced and irrigation systems installed to enable the commencement of farming. Up to 2 073 emerging farmers were also providing produce under the Johannesburg Fresh Produce Market's transformation programme. The City also encourages citizens and communities to create food gardens to assist in the provision of food to people in need and 404 households started growing their own food (City of Johannesburg, 2014:15). Furthermore, PIKITUP implemented a programme where communities assist in cleaning illegal dumping sites in exchange for food and 142 Individuals are currently participating in the programme. Five sites have also been identified and prepared to be used as food gardens in order to address food insecurity in poor areas whilst providing a sustainable solution to the residents (City of Johannesburg, 2014:68). The City of Johannesburg 2040 Growth and Development Strategy however indicate that only three percent of households in Johannesburg grow their own food even though residents, especially in the south of the Municipal area, show enthusiasm for farming programmes. Three levels of intervention are recommended to include firstly, the use of a range of instruments to tackle individual hunger on a day-by-day basis, such as food vouchers, food parcels, backyard gardens and programmes to connect citizens to income generating activity, thereby enabling them to buy food. Secondly, provision of support to the informal food supply sector, and finally, support for urban agriculture at the area level, where feasible, in order to connect networks of local producers to packing houses and wider distribution networks (City of Johannesburg, 2011:46).

The Gauteng Department of Agriculture and Rural Development implemented the Gauteng 20-year Food Security Plan with the vision to reduce food

insecurity in the province by half the 2011 levels by 2030. This will entail that no more than 5% of the population should experience hunger, no more than 10% of the population should experience inadequate access to food, and no more than 13% per cent should live in poverty. The plan will implement carefully designed programmes in order to meet the needs of the food insecure and to include individuals and communities into the economy through increasing their purchasing power and providing sustainable livelihood options. Multiple stakeholders will implement the plan, including all social sector role-players in government (provincial and municipal) in collaboration with the private sector organisations of civil society (GDARD, 2013:24).

The City of Cape Town Metropolitan Municipality also supports urban agriculture and states in the City's 2013/2014 annual report that the City was involved in the implementation of an urban agriculture support programme that provided strategic assistance to 85 community groups and projects during the review period. The programme offered support in the form of operational inputs, infrastructure, mentoring, training, advice and access to land (City of Cape Town, 2014:39). The City furthermore implemented 45 poverty reduction projects in the form of food gardens in an effort to reduce and alleviate poverty in poor communities (City of Cape Town, 2014:70). The City also developed the Food Gardens Policy in support of poverty alleviation and reduction during this period (City of Cape Town, 2014:69). The City of Cape Town's Environmental Health Section implements a Food Quality and Safety Programme that is designed to regulate, monitor, evaluate and control the quality and safety of food products supplied to the citizens of Cape Town. The aim is "…to reduce the health and safety risks resulting from exposure to contaminated or misbranded foods supplied by any formal and informal food retail and processing establishments located within the City of Cape Town" (City of Cape Town, 2015).

The eThekwini Metropolitan Municipality supports and encourages community gardens as a measure to provide food security to the city's communities. The

City's 2013/2014 annual report states that the Parks, Leisure & Cemeteries Department has initiated and sustained 53 community gardens throughout the City, providing seedlings, equipment and educating the community on how to plant in a sustainable way to feed their families during this period. A garden outside the City hall showcases and displays the concept of community gardens for all (eThekwini, 2013:215).

4.5 CONCLUSION

The usefulness of approaching food security/hunger in urban South Africa from a disaster risk reduction perspective is investigated and discussed in this chapter by making use of examples in the South African context. In order to achieve a balanced disaster risk reduction strategy, both an assessment of the hazard and vulnerability conditions of an at-risk community are necessary. It then becomes clear that in terms of urban food insecurity in South Africa's urban areas it is the poor who is most vulnerably as a result of numerous factors.

This chapter further establishes that appropriate methods and practical tools for disaster risk reduction are essential and that development studies conducted in terms of the sustainable livelihood approach and other vulnerability theories, can assist in understanding and analysing livelihoods and the relationships between disaster risk, vulnerability, hazard and coping capacity. It is evident that these studies provide valuable information and guidelines for future research.

Chapter 5 provides conclusions and recommendations of the research conducted. The conclusions are discussed according to the research questions proposed for the study, and a brief summary of the findings relating to the research objectives is also included.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

South Africa is considered to be a food secure country at the aggregate level, however large numbers of households within the country are food-insecure (Altman *et al*., 2009a:345; Ngandu *et al*., 2010:58; Du Toit, 2011:4). Food security implies the availability of, access to and utilisation of safe and nutritious food maintained over time, while considering potential natural, economic, social and political impacts. Food insecurity therefore occurs when one or more of the dimensions of food security are weakened, as the availability of, access to, and utilisation of food are interrelated and a single element cannot assure food security on its own. This study provides an overview of the prevailing theories pertaining to disaster risk reduction and urban food insecurity and further investigates the nature of the relationship between disaster risk reduction and food security within urban South Africa. The study specifically considers whether disaster risk reduction activities provide a useful framing for the food insecurity problem in the country's urban areas.

This chapter provides conclusions and recommendations of the research conducted. The conclusions provide an overview of the literature reviewed and are discussed according to the research questions proposed for the study, being: 1) what are the prevailing theories pertaining to disaster risk reduction and urban food insecurity?; 2) what is the relationship between disaster risk and food security in urban areas in the South African context? and; 3) what recommendations can be made to improve food security by reducing

vulnerability to food insecurity in terms of the prevailing theories? A brief summary of the findings relating to the research objectives is also included.

5.2 CONCLUSIONS

South Africa is characterised by high levels of poverty and inequality which means that many households do not enjoy food security or adequate access to food. There is extensive literature on the fact that the challenge of urban food insecurity is not availability but access to adequate, nutritious food. Poverty can thus be related to food insecurity as the inability to gain access to adequate, nutritious food mainly stems from limited income or limited opportunities to generate income. Conversely, food insecurity and malnutrition undermines productivity and reduces income, which can ultimately lead to people living below the poverty line. Statistics South Africa makes use of a set of three national poverty lines in order to measure poverty in the country. The rand value of each line is updated annually using consumer price index data. The most recent estimation (for 2014, in rand value and *per capita* per month) is R 400 for the food poverty line, R 544 for the lower bound poverty line and R 753 for the upper bound poverty line. Individuals living below the upper bound poverty line are still considered to be in poverty. Poverty is therefore considered a widespread problem in South Africa as the urban poor struggle to meet their basic household needs in light of shocks such as unemployment and disasters, which place severe pressure on urban households. Poor urban households are furthermore less likely to consume a diet that meets sufficient nutrient requirements. As a result, undernutrition or malnutrition can manifest in underweight and stunting in children.

The effect of poverty on food security is further exacerbated by rising food prices and food emergencies as the poor find themselves unable to buy the food necessary to satisfy their dietary needs. Food price movements are therefore an important matter which can have severe social implications for the

poor and influences the overall cost of living conditions in South Africa and should not be underestimated as was the case with food price-related riots in 2008 and 2011 in several countries (Rangasamy & Nel, 2014:31). As a result of the rising food prices in 2008, xenophobic violence and service delivery protests occurring in urban areas in Gauteng during the same year, the 2008 Gauteng Food Summit took place (Taylor, 2013:767). Taylor analysed the summit and found that the government's response to the 2008 food crisis was largely that of political opportunism, rather than a genuine desire to consult and solve food security problems. The investigation found that the province was underprepared for an acute food emergency situation and was fortunate that the crisis subsided peacefully as food prices righted themselves, albeit to a new level.

Urban food security is consequently highly dependent on money, but income poverty is not the only challenge to overcome and it is important that urban food security in South Africa be understood in connection with other developmental challenges. The challenges discussed in this study include rapid urban development, the HIV/AIDS epidemic and climate change. Urbanisation, seen as a process of social transformation, can affect rural agriculture and therefore overall food security as urban areas have to rely on external food sources because more food is usually consumed within an urban area than that which the area can produce. High rates of urban unemployment, deteriorating infrastructure, overcrowding and environmental degradation are furthermore responsible for challenges in providing sufficient food supply to urban areas. HIV and AIDS interact negatively with food security at household level and people living in informal settlements in urban areas in South Africa, have a higher HIV prevalence than people living in urban formal, rural formal and rural informal areas. South Africa is furthermore expected to experience higher temperatures and less rainfall as a result of climate change. This will affect agricultural practices, which in return will lead to changes in food production and international trade patterns and ultimately affect food security in the country. Although these occurrences are not solely responsible for food

insecurity, it can influence urban food security as immediate or underlying causal factors.

Natural or human induced hazards such as floods, droughts, crises and conflicts can destroy livelihoods, reduce food production and increase hunger, thus affecting all dimensions of food security. Efforts to address these hazards are important, as the risk of disasters can pose serious threats to sustainable development. Disaster risk is defined in chapter 2 as a combination of the factors that determine the potential for people to be exposed to particular types of hazards. Disaster risk reduction then aims to minimise vulnerabilities throughout a society in avoiding or limiting the adverse impacts of these hazards within the broad context of sustainable development. With reference to this, it can be argued that disaster risk and food insecurity are directly related.

Effective disaster risk reduction primarily entails careful risk identification and analysis before implementing prevention or mitigation actions. It is therefore important to understand the potential risk and to develop and implement the relevant policies, strategies and practices accordingly. In this instance, risk is made up of the interaction between hazards, vulnerabilities and capacities and an assessment of risk therefore requires an analysis of these concepts. In light of this, a hazard can be seen as a potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. The vulnerability dimension of food security consists of two components. Firstly, a household's food insecurity is a function of its exposure to shocks such as food price inflation; and secondly, it is a function of the household's ability to cope with these shocks. In addition to hazards and vulnerability and their relationship to risk, coping capacity is a combination of all the strengths and resources available within a community, society or organisation that can reduce the level of risk, or the effects of a disaster. Food insecure households however often resort to detrimental coping strategies

when affected by disasters. A common coping response to household food insecurity is reducing the quality and quantity of food and skipping meals, while at the same time working longer hours which has long-term health consequences. Disasters and associated shocks also have the ability to force already poor households to dispose of their assets which leads to further poverty and a weakened ability to access adequate food.

In order to improve food security at the household level, the risk involved must be identified and the households vulnerable to the specific risk must be determined. The most prominent hazards threatening household food security in urban South Africa is food price inflation such as the steep increase in global food prices between 2005 and 2008, which also resulted in conflict such as the xenophobic riots in 2008 and the mining-sector strikes in 2012, that coincided with the drought in the USA during the same period, which led to a new increase in food prices. Droughts and floods also have an impact on food security in South Africa, although to a lesser extent. It was also established that the households most vulnerable to urban food insecurity are the poor, usually living in informal urban areas.

The implementation of prevention and mitigation measures can assist in reducing communities' vulnerability to disasters. Oxfam (2012:10) provides a summary of disaster risk reduction activities implemented in their livelihoods and food security programming. Some of these activities that could be successfully applied at the household level in the South African urban context include raising awareness on the importance of household preparedness, such as processing and stocking of food; promoting nutrition awareness of fruits and vegetables, including indigenous foods; promoting food/community gardens in order to establish some self-sufficiency in providing food for the household and establishing an eagerness to participate in community projects related to alleviating food insecurity.

This focus on risk aversion then constitutes disaster risk reduction with the aim to avoid or limit the risk of hazards impacting on vulnerable conditions and in doing everything possible before a disaster occurs to protect the lives of people and their livelihoods. Disaster risk reduction can therefore assist in the alleviation of hunger as it aims to protect livelihoods from shocks, and consequently make food production systems more capable of absorbing the impact of disruptive events and recovering from such events.

This research further considered a number of development studies conducted in South Africa which incorporated the sustainable livelihood approach and other vulnerability theories. The purpose of implementing these frameworks and models into development investigations is to attempt to understand and analyse livelihoods and explore the relationships between disaster risk, vulnerability, hazards and coping capacity. It was established that appropriate methods and practical tools for disaster risk reduction are essential to promote sustainable development.

Chapter 4 provides an overview of the contribution of four metropolitan municipalities in South Africa towards fighting hunger and poverty in their respective municipal areas. Although urban food security is highlighted as an overall objective on a municipal level, it would seem that municipalities put a lot of emphasis on urban agriculture and food gardens, with food banks playing a minor role in fighting hunger. The value of urban agriculture should not be underestimated as it provides some form of self-efficiency in providing households with food as is evident from the extensive literature on the subject. There are however those who are sceptical about the extent of urban agriculture's positive impact on food security and poverty alleviation. According to Crush, Hovorka, *et al*. (2011: 298) urban agriculture is not as important to the food security of the urban poor or as widely practiced in Southern Africa as is often believed. They use Johannesburg as an example where urban food production in the inner City is almost non-existent, although urban agriculture is practised more in Orange Farm, a newer informal settlement and in

Alexandra, an established township. Stewart *et al*. (2013:4) highlights the urban health risks and implications for the environment associated with urban agriculture. Produced food could be contaminated through the use of waste water and intensive irrigation could lead to the spread of malaria and waterborne diseases. Soil erosion can furthermore cause environmental harm. Frayne, McCordic, *et al*. (2014:187) are of the opinion that the benefits of urban agriculture as a broad urban development and food security strategy are unclear and they find that under current approaches and regulations, urban agriculture has limited poverty alleviation benefits. The contribution of agriculture and food gardens within an urban setting is therefore not sufficient to successfully address poverty and food security in these areas and local and provincial governments should commit to better understand the effects on urban populations and their environments in order to alleviate hunger and reduce food insecurity in urban areas. Despite South Africa's attempts at implementing food security programmes, the objective of ensuring household food security and poverty reduction in urban areas has not been achieved. The urban context as well as the relationship with challenging factors such as urbanisation, HIV/AIDS, climate change and rising food prices need to be further explored in order to obtain extensive and comprehensive knowledge for addressing food security and poverty in urban areas.

This study made use of existing literature on the topic of urban food security and established that poverty and food insecurity are existing problems in South Africa's urban areas. This is a result of various underlying factors which affect those who are already living in poverty/on the brink of poverty and therefore at risk of being food insecure. It was further established that there is a relationship between food security and disaster risk reduction at the urban household level in the South African context. Disaster risk reduction activities can be successfully implemented to assist in avoiding or limiting the risk of potential shocks impacting on those vulnerable to food insecurity.

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