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Analysis of food insecurity challenges and coping Strategies among households in the North-West province of South Africa

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**ANALYSIS OF FOOD INSECURITY CHALLENGES AND COPING
STRATEGIES AMONG HOUSEHOLDS IN THE NORTH-WEST
PROVINCE OF SOUTH AFRICA**

By

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Submitted in partial fulfilment of the requirements for the degree

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DECLARATION

I, Dorcas Opeyemi Soladoye, declare that the submission of this dissertation is in fulfilment of the requirement for the degree of Master of Science at the Tshwane University of Technology. This dissertation does not contain other people's data, pictures, graphs, or other information, unless specifically acknowledged as being sourced from other persons, and has not been previously submitted to any other institution of higher education for a similar or any other degree award. I further declare that all sources cited or quoted are indicated and acknowledged in a comprehensive list of references.

Dorcas Opeyemi Soladoye

Signature D.O

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ABSTRACT

Household food insecurity persists among rural dwellers in most South African provinces. There is a diverse group of strategies employed by affected households to cope with inadequate food. However, a plethora of limitations plagues coping strategies, which further deepens the threat to the food security status of villagers who adopt them. This study investigated food insecurity related challenges experienced by rural households in North-West Province, South Africa. The study also identified and evaluated the coping strategies adopted by the households to combat food insecurity. The study used secondary household data to achieve the objectives. The results of the study revealed that food insecurity threatened 23.33% of households and there was a wide economic inequality, as shown by income distribution in the study area. Other results showed that food purchases served as the major source of food commodities consumed. Further results indicated that the major challenges for households to meet their food needs include increases in food prices, cost of food production, and household size. However, the study identified that adjustments to household eating patterns and seeking alternative sources of financing for food purchases as the major coping mechanisms of food insecurity. In this study, little government intervention was recorded for the food insecure house. An intensification of government intervention and extension services through a review of existing ones, the development and implementation of new interventions focusing more on capacity building through technical knowledge and skill acquisition, job creation and providing resources (mainly land and farming inputs) for rural households to fully practice food production.

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CHAPTER 1

Introduction

1.1 Background

Over the years, food insecurity has become a growing concern as over 1 billion people are suffering from starvation and malnutrition (are these global, regional or South Africa statistics?) (Barrett, 2020). According to Korale-gedara *et al.* (2012), over 239 million people are suffering from hunger in Africa, and there is a possibility of an increment in the number a few years from now (Next give the scenario for South Africa, and then North West Province (the study area) if available). To this end, Sasson (2015) describes food security as a situation whereby individuals have physical, social and financial access to nutritious food that meets their dietary needs. Conversely, food insecurity exists when food is not easily accessible and households experience difficulties in securing adequate food. Initially, the focus of food security was based on whether a nation or region could acquire sufficient food to meet the needs of its people. However, the attention on food security has shifted from national and global to household and individual levels due to several factors (Kamwendo and Kamwendo, 2014).

Food security has four major components, and these are *availability*, *access*, *utilisation*, and *stability* (Anderson, 2019; García-Díez *et al.*, 2021, Ogot, 2021; Swaminathan and Bhavani, 2013). Despite that food availability remains the fundamental component of understanding food security, other writers argue that it is not enough to ensure that households have access to food (Jones *et al.*, 2013). For this reason, the World Food Summit redefines food security as comprising physical and economic access to sufficient, safe, and nutritious food which can meet the dietary needs and food preferences for active and healthy life (reference). In this case, food access implies having a range of food choices available to a specific person or household based on the price and their income (reference). While utilisation describes whether individuals and households make good use of the food to which they have access or not. With the above components, there are some other aspects of food security which include *adequacy*, *affordability*, and *acceptability*. Kirkpatrick *et al.*, (2015) and; Whelan *et al.*, (2018) associate adequacy to food quality and quantity. On the other hand, affordability concerns the price and ability to purchase food (Whelan *et al.*, 2018, Ryckman *et al.*, 2021). Finally, acceptability relates to issues surrounding the interaction food has with the consumer at a given moment in time, includes food characteristics and cultural considerations, among others (Maina, 2018; Spill *et al.*, 2019). According to Nassirou Ba (2016), a major cause of food insecurity is inadequate food production. Over the years, governments have provided numerous incentives to producers to increase food

production. Climate change and weather vagaries are also compounding food insecurity worldwide by disrupting farming activities, which in turn has affected the food supply the (Verschuur *et al.*, 2021)

In the South African context, food insecurity goes beyond insufficient food production, availability and consumption (Altman *et al.* 2009). , The continuous detrimental situation of both women and children in households, as well as female teenagers, is thoughtful. The literature has shown that one of the core determinants of food security in households is income, amongst others. However, many South Africans still suffer unemployment and poverty; consequently, there is no guarantee of food security for such individuals, families, or households. The literature has revealed several initiatives by the South African government to ensure adequate food supply to combat food insecurity. However, based on a recent study about the prospect of food, food supply is faster than the expansion of the population, but this does not necessarily mean the complete elimination of starvation, considering the high rate of unemployment in South Africa.

Although the (indicate the year) Income and Expenditure Survey (IES) indicates that there have been improvements in the food security situation in South Africa at the national level, the story is different at the household level. For example, the IES shows that there has been a decrease in the proportion of the population who suffer from food insecurity from 52.3% in 1999 to 25.9% in 2008. However, one in four people suffer from food insecurity regularly and more than half of the population are reported to be at risk of going without food most of the times (Tawodzera, 2016). Furthermore, the 2018 General Household Survey, shows that 12.6% and 21.5% of the households were vulnerable to hunger and had limited access to food, respectively.

1.2 Justification

A few studies have shown that food insecurity, poverty and hunger exist in South Africa (Verschuur *et al.*, 2021; Kehoe *et al.*, 2021). Millions of Rands are being spent annually in South Africa on food aid programmes which focus on alleviating hunger and poverty. Few studies in South Africa empirically estimated the extent of food insecurity, and household vulnerability and describe household coping strategies employed by affected households (Abrahams *et al.*, 2021).

The relevance of the study is that there is inadequate information that has been generated on the food security situation at the household level in South Africa. Lacking in the empirical literature is also knowledge on the coping strategies employed by the households that face food insecurity in North-West Province of South Africa. This study aimed to analyse the food insecurity challenges among

households in North-West Province and the coping strategies households employ in combatting the challenges they face. The outcome of the study will contribute to the development of policies and programmes to address food insecurity

1.3 Research Problem

Food insecurity in South Africa is not new and is experienced in both rural and urban areas and varies between provinces. Between 2015 and 2016, South Africa experienced drought, which resulted in water restrictions and food price inflation leading to food insecurity. Besides this, South Africa is considered the country with the highest income inequality, poverty, and unemployment. To address the impact of food insecurity across the country, the South African government has launched several initiatives, such as grants and the distribution of food parcels (Drysdale *et al.*, 2021). However, despite the measures put in place, food insecurity has been on the rise across the country since the era of covid-19 lockdown, leading to severe challenges for households, particularly those in rural areas. Therefore, the challenges faced by food insecurity households necessitated the need to analyse the coping strategies employed by the households in combatting food insecurity.

1.4 Research Objectives

The following are the research objectives of this study:

1. To identify challenges and coping strategies among food insecurity in households in the North-West Province of South Africa
2. To determine socioeconomic factors that influence the choice of coping strategies among rural households affected by food insecurity

1.5 Hypothesis

Socioeconomic factors, such as age, gender, employment, educational level and income level influence food insecurity and coping strategies employed by households in North-West Province.

1.6 Methodology

1.6.1 Study area

This study focused on the North-West Province of South Africa. According to 2019 mid-year population estimate for South Africa, North West Province had an estimated population of 4.02 million people (Stats SA, 2019b). The number of households in the province is estimated at 1.2 million, with an average household size of three people (Stats SA, 2018).

1.6.2 Sampling Procedure and Technique

With the help of local communities, the application of two-stage cluster sampling selected villages and households as the ultimate sample from each stratum. Each household is a system within which the most important decisions affecting food security are made, i.e., what income-generating activities to engage in, how to allocate food and non-food consumption among household members, and what strategies to implement to manage and cope with risks. Households within the villages remain the ultimate sampling unit, and there were 170 households sampled.

1.6.3 Data collection techniques

This research employed data collected by the Indigenous Knowledge System South Africa (iKSSA) in Bojanala Platinum and Dr Kenneth Kaunda District Municipality. There were 170 households considered for participation.

A stratified sampling procedure sourced the secondary data which was collected by the Indigenous Knowledge System South Africa (iKSSA) from a sample of 170 households. The collection of the data was through a structured questionnaire at the household level to know the coping strategies households employed in the face of shortages of food, but also included information on the following:

- Demographic characteristics, which included the structure of the household and age
- Food variables, i.e., household food availability and accessibility
- Information on shocks and risks at the household level in cases of food shortage
- Strategies adopted by the household when food insecurity strikes

The study collected data on the following socio-economic factors; families (households) and communities' access to food, affordability of food, agriculture, and coping strategies in case of food insecurity. The coping strategy factors focused on how agricultural involvement has provided participants with extra food or a source of income, hunger, and access to food, as well as how frequently households have experienced inadequate access to food.

To ensure the upholding of human dignity, the researcher sought consent from the participants and allowed them to decide whether to participate in the study. Furthermore, preserving privacy and confidentiality was by ensuring there was no private information disclosed.

1.7 Data Analysis

The data were analysed using Statistical Package for Social Sciences (SPSS). Descriptive and inferential statistics on socioeconomic characteristics of respondents were generated first, before proceeding with estimating the other covariates. The descriptive statistics such as means, frequencies,

and standard deviations described and the socio-economic characteristics of the households that participated in the study.

1.8 Outline of the Chapters

Chapter 1: The chapter introduces the study. It presents a brief background to food insecurity and its associated factors. The chapter also presents the problem statement, research aim, and objectives and the methodology employed in the study.

Chapter 2: Presents a literature review on food insecurity, food security and its elements. In addition, the chapter also conducts a critical empirical literature review food insecurity in line with the focus of the study.

Chapter 3: Presents challenges of food insecurity and coping strategies. The article begins with an introduction to food insecurity, a review of literature, methodology and findings and a discussion

Chapter 4: Presents the socioeconomic variables and challenges affecting rural households in coping with food insecurity. The chapter commences with an introduction, review of literature, methodology, findings, and discussions.

Chapter 5: Presents summary, conclusion, and recommendation of the study.

CHAPTER 2

Literature Review

2.1 Introduction

This chapter presents a critical review of food security and insecurity. It defines concepts while also discussing the elements of food security and levels of food insecurity. The food insecurity in South Africa, the factors contributing to the situation, and the strategies individuals and households use to cope with food insecurity are discussed.

2.2 Food Security and its Elements

2.2.1 Food security

The World Food Conference of 1974 defined the term “food security” as the availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices (United Nations, 1975; Berry *et al.*, 2015). Although the basic definition of food security is the ability of individuals to obtain sufficient food on a day-to-day basis, there have been several broad and more elaborate definitions used. For instance, according to the World Food Summit of 1996, food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, nutritious food to meet their dietary needs and food preferences for active life (Hussein, 2002; Sabi, 2018). This definition provides functional conceptual elements for analysing food security, which this study will adopt.

2.2.2 Elements of food security

As the concept of food security continued to evolve and develop with time, so also did its complexity. At the 1974 World Food Summit, the focus was on food volume and the stability of food supplies. There were several other elements incorporated into the concept. In 1983, the Food and Agriculture Organization (FAO) of the United Nations included the idea of access. In 1986, the World Bank added sufficiency for individual consumption, while at the 1996 World Food Summit of the World Food Program (WFP), the idea of ‘safe and nutritious’ along with food preferences were included (FAO, 2013). The new dimensions of food security arose due to attempts to find answers to questions of equity, poverty, and other socioeconomic barriers, in addition to food production, storage and supply (Cochrane, 2017). Other fundamental elements of food security include availability, access, utilisation, and stability (Ogot, 2021; FAO, 2008).

2.2.1.1 Food availability

According to Ogot (2021), food availability is the situation where food is made to exist for consumption at local levels where individuals or households can locate their food needs without striving. In other words, this is physical availability of food stocks in sufficient quantities and of the appropriate quality for individuals, households, and nations (Swaminathan and Bhavani, 2013; Anderson, 2019). It is estimated as food production plus net imports less storage less wastage (Headey and Ecker, 2013). The focus of food availability is on food supply through local production and imports (Mockshell and Villarino, 2019; Anderson, 2019). Having identified food availability as fundamental for ensuring food security, the global focus was on the increase in sustainable food production through agricultural technology advancement.

2.2.1.2 Food access

Food accessibility refers to the ability of individuals and households to have sufficient access to sufficient resources to have appropriate food on a sustainable basis (reference). According to the WFP, food accessibility means that individuals and households possess physical, economic, and social access (Sabi, 2018; Anderson, 2019). This may be achieved through subsistence agriculture, where individuals or households engage in food production to cater to their food requirements, purchase from local stores/markets, borrow from friends and family, or seek food assistance or gifts (Sabi, 2018). On the other hand, Sage (2014) defines food accessibility as food affordability, allocation, and preferences that enable people to translate their hunger into effective demand. This definition reflects the physical, sociocultural, and economic elements of access to food, which may present challenges to realisation of food security. The physical dimension of access to food centres around transportation and information regarding getting food to those who require it (Maxwell *et al.*, 1999; Leuthart *et al.*, 2021; McDermot *et al.*, 2017). Although accessing food commercially is a critical security factor, it is a potent challenge to low-income households or individuals (Pereira *et al.*, 2014; Anderson, 2019). Where there is food availability, hence physical access to food, many individuals and households may not have the necessary funds to purchase such food. Although studies that evaluate how socio-cultural issues may influence food accessibility are not readily available, some emerging data suggests that prevailing social norms (Sabi, 2018) and food culture (Owino, 2019) have influence on individual and households' access to food.

2.2.1.3 Food utilisation

Food utilisation denotes nutritious and safe food that adequately meets the individual or household's dietary needs. According to FAO (2008), food utilisation is how the body makes use of the most of various nutrients in the food. Utilisation concerns good use of the food(s) to which individuals and

households have access. It addresses the proper biological use of food, requiring a diet that provides sufficient energy and essential nutrients, good care and feeding practices, food preparation, diversity of the diet, and intra-household food distribution (FAO, 2008; Sabi, 2018; Barrett, 2010). Utilisation is geared towards achieving a state of nutritional well-being in which all physiological needs are satisfied (García-Díez *et al.*, 2021). Utilisation is a food security concept that addresses issues about nutrition security.

2.2.1.4 Food stability

Stability encompasses the consistency of the other three elements of food security. It is a time dimension to availability, access, and utilisation (Anderson, 2019). Food stability dictates that to be food secure, food availability, access, and utilisation must be ensured at all times for an individual, household, or population (FAO, 2006). In other words, it implies all risks of losing food availability, access, and utilisation as a consequence of sudden shocks or cyclical events, for example, an economic, climatic, or political crisis or seasonal food insecurity (FAO, 2006; García-Díez *et al.*, 2021).

2.3 Food Insecurity

When one or more of the four core prerequisite elements of food security are not satisfied or achieved, thus leading to the disruption of food intake, and eating pattern, the affected individual, household, community, or nation is said to be food insecure. Similarly, food insecurity, , has been defined in several different ways (Hamad and Khashroum, 2016; Gulliford *et al.*, 2003). For example, Gulliford *et al.*, (2003) described it as “limited or uncertainty in the availability of nutritionally adequate and safe foods or inability to acquire acceptable foods in socially acceptable ways” Food insecurity is a critical global challenge with negative impacts on human development, caused by widespread poverty and inequality, affecting close to 800 million people worldwide (Vilar-Compte *et al.*, 2020). It is a multidimensional situation presented in different ways and at several levels, such as regional, national, community, household, and individual levels (Chakona and Shackleton, 2019; Hamad and Khashroum, 2016).

Food insecurity can be chronic, transitory, or seasonal (Brander *et al.*, 2021; Anderson, 2019; Devereux and Tavener-Smith, 2019; FAO, 2008; Sage, 2014). Food insecurity is long-term or persistent when people, especially marginalised individuals, and households, cannot meet their minimum food requirements over a sustained period. This type of food insecurity is said to be chronic (Anderson, 2019). It may be short-term or temporary where there is a sudden decline in the ability to produce or access to enough food to maintain a good nutritional status, which FAO (2008) refers

to atransitory (. For example, civil and political unrest, as recently experienced in the Gauteng and KwaZulu-Natal Provinces, natural disasters, and pandemic, and spikes in food prices disrupt food production and food distribution. These adversely affect availability and access to food temporarily, leading to transitory food insecurity. Seasonal food insecurity may emanate from a post-harvest season of plenty followed by a pre-harvest season of scarcity and high food prices (Anderson, 2019, Devereux and Tavener-Smith, 2019, Brander *et al.*, 2021). This type of food insecurity is common with smallholders working on family farms who rely on subsistence food production(Devereux and Tavener-Smith, 2019).

2.4 Food Insecurity in South Africa

Section 26 and 27 1(b) of the Constitution of the Republic of South Africa of 1996 articulates the right of every South African to access sufficient food and water (Masipa, 2017). This also aligns with South Africa's millennium development goals of reducing poverty by half by 2015. At the national level, South Africa is considered to be food-secure (Chakona and Shackleton, 2019). However, at the micro-level, for example, community, households, and individuals the situation is different (Stats SA, 2019c). Several studies have indicated that a large proportion of individuals and households, both in rural and urban areas and settlements, are vulnerable to the incidences of food insecurity in South Africa (Chakona and Shackleton, 2019; Hendriks, 2014; Devereux and Tavener-Smith, 2019). According to a 2017 survey that involved 16.2 million households, 15.8% assented that their food access is inadequate, while 5.5 % households described their food access as severely inadequate (Stats SA, 2019c). The challenges that limit replicating the achieved national food security at the community, household, and individual levels are associated with economic access (Hendriks, 2014; Chopra *et al.*, 2009; Ledger, 2016).

2.4.1 Factors that contribute to food insecurity in South Africa

Several social, economic, natural, and political factors are responsible for the high rate of food insecurity in South Africa. These may act independently or in synergy, thereby leading to different levels of food insecurity by adversely affecting one or more fundamental elements of food security. A discussion of some of these critical contributing factors follows.

2.4.1.1 Low agricultural production

Local food production contributes to food security at the individual, household and community levels (Prosekov and Ivanova, 2018). Agriculture contributes to food security at the household by increasing local food supply, reducing food prices and creating jobs, Earl (2011) notes that to achieve

sustainable food security there is need to encourage individuals and households engage in the production of food for their subsistence. Dwindling agricultural productivity, fostered by poor crop performance, unfavourable weather and climatic factors, and the inability to access farming inputs, among others, continue to drive food insecurity in South Africa (Masipa, 2017; Earl, 2011; Chakona and Shackleton, 2019). When production drastically reduces, individuals and households must purchase their food from the local market. However, this is not often achievable because of high food prices and the limited purchasing power of rural farmers (Chakona and Shackleton, 2019), threatening their food security status.

2.4.1.2 Access to land

Inequalities in accessing productive agricultural land and the current urbanisation patterns militate against food security status among rural and urban dwellers in South Africa (Chakona and Shackleton, 2019; Earl, 2011; Prosekov and Ivanova, 2018). Individuals and households in urban areas are more prone to food insecurity since it is harder to secure arable land for agricultural activities.

2.4.1.3 shocks

Highlighting the significance of shocks, Mthethwa and Wale (2021) noted that vulnerability to food insecurity is a function of not only exposure to shocks but also the capacity of each household to deal with the welfare impacts of the shocks. The 2021 political crisis that resulted in the looting and burning of shops and businesses in parts of KwaZulu-Natal and Gauteng provinces threatened the food security status of many residents (Chothia, 2021). Weather and climatic factors, such as limited rainfall, drought, and increasing daily average temperature, limit agricultural productivity can cause significant shocks that affect food availability and access (Kubik and May 2018; Sage, 2014).

2.4.1.4 Unemployment

The current unemployment rate in South Africa is 32.6%. Rising unemployment has, therefore, has been identified as an important cause of food insecurity (Stats SA, 2019c; Chakona and Shackleton, 2019; Dodd and Nyabvudzi, 2014). Many South Africans purchase their food commodities from stores and shops. Unemployed individuals or households struggle to get food. However, when they do, it is usually insufficient in nutritional quality and quantity due to a lack of money (Chakona and Shackleton, 2019).

2.4.1.5 Poverty

Poverty is an aggregation of diverse dimensions of deprivation that relate to human capabilities, including food security and consumption, dignity, health, education, rights, voice, security, and

decent work (OECD, 2001). Individual and household food insecurity is closely linked with their socioeconomic status, which is determined by income, employment status, and food expenditure (Chopra *et al.*, 2009). Reports show that South Africa has a high rate of income inequality, with extremely high levels of poverty (Stats SA, 2019a). More than 50% of South Africa's population live in poverty, with a significant percentage of these living in extreme poverty, below the food poverty line (Chakona and Shackleton, 2019; Plagerson, 2021). The high poverty rate in South Africa contributes to the high rate of food insecurity among its citizens (Chopra *et al.*, 2009; Chakona and Shackleton, 2017; Stats SA, 2019c).

2.4.1.6 Inflation and increase in food prices

Inflation and high food prices contributing to food insecurity among South Africans. As inflation increases, the purchasing power decreases. This can affect the ability to access and acquire quality food in sufficient quantities by low-income earners who spend a greater percentage of their income on food commodities (Jacobs, 2010; Mkhawani *et al.*, 2016). High food prices usually force the poor to adjust their diets to less nutritious diets (Mkhawani *et al.*, 2016), thus threatening their food utilisation and food security. Seasonal spikes in food prices contributes to food insecurity among rural farmers in South Africa (Devereux and Tavener-Smith, 2019; Dodd and Nyabvudzi, 2014; Sikuka, 2021). Kubik and May (2018) note that an increase in food prices that result from weather shock has a negative impact on household food security.

2.4.1.7 Population growth

Population growth can threaten food security at all levels if not accompanied by increased food production and supply. This is because rapid population growth triggers an increase in the demand for food commodities (Porter and Kwasi, 2017). which can threaten food security if food supply does not increase (Hall *et al.*, 2017). In rural farm settings, an increase in population may result in higher demands and pressure on already limited arable land, thus threatening the production of sufficient food to meet the growing populations needs.

2.5 Strategies for Coping with Food Insecurity

Coping strategies are contingency mechanisms targeted at addressing issues about food access and availability. There are several strategies that individuals and households devise to access food when threatened by food insecurity.

2.5.1 Food rationing

Rationing or shortfall management strategies involve one, or a combination, of (a) restriction in food portion size, (b) omission of meals, and (c) limiting food consumption by adults so that children can have enough to eat (Cordero-Ahiman *et al.*, 2018; Drysdale *et al.*, 2019; Ngidi and Hendriks, 2014; Maxwell *et al.*, 2008). This strategy enables the individual or household to manage the available food so that supply takes longer to run out.

2.5.2 Collection of food from the wild

Relying on natural sources for food is a widely adopted strategy for coping with food insecurity (Ngidi and Hendriks, 2014; Chakona and Shackleton, 2017; Chakona and Shackleton, 2019). Based on their observation that the collection of foods from natural sources or the wild could improve household food security, Chakona and Shackleton (2019) suggested the promotion of the use and consumption of wild foods in communities. Emerging experimental evidence indicates that the collection of wild and natural foods is a viable coping strategy. In this case, there is a need to create awareness of its benefits in increasing dietary diversity. (Chakona and Shackleton, 2017; Chakona and Shackleton, 2019).

2.5.3 Alternative sources of income

Social grants, gifts, and engaging in menial jobs are alternative sources of income through which many individuals and households, who face food shortages and instability adapt. In severe cases of food insufficiency some individuals sale personal properties and assets (Drysdale *et al.*, 2019). Engaging in agricultural activities as an alternative source of income may also serve as a coping strategy to mitigate food insufficiency (Stats SA, 2019c).

2.5.4 Loans (food or money)

Borrowing food and money from friends and relatives may alleviate an individual or household's immediate food insecurity issues. However, in the long term, it may be counterproductive. This is because the practice may lead to difficulties to cater for future food needs due to of accumulated debts. Nonetheless, it is still a commonly reported coping behaviour among the low income rural and urban dwellers (Ngidi and Hendriks, 2014).

2.5.5 Agricultural activities

A recent report shows that 78.5% of South African households engage in agricultural activities to supplement food for the household (Stats SA, 2019c). Based on the findings of their study on the food access dimensions of food security and weather shock, Kubik and May (2018) noted that the

production of food for personal consumption, as a coping strategy, might alleviate food insecurity among the poor.

2.5.6 Dietary change

Making changes to diet is a coping strategy that allows individuals and households to conserve income and money. It involves switching to diets that are less expensive and usually less preferred, thereby saving money (Ngidi and Hendriks, 2014; Drysdale *et al.*, 2019). Although this strategy constitutes a threat to food utilisation, since there may be a compromise in the nutritional quality and safety of such foods, it does help the affected individual or household ensure economic access to food. Adjusting food diet in response to perceived or anticipated food insufficiency appears to be a widely adopted coping strategy (Cordero-Ahiman *et al.*, 2018).

2.6 Chapter Summary

This chapter reviewed the concept of food security and its elements, food insecurity, and the state of both concepts in South Africa. It discussed the factors that contribute to food insecurity as well as the common coping strategies employed by households and individuals in mitigating the threat of inadequate food. Although South Africa is food secure, the realities at the individual and household levels are not in tandem with the national food security status. Several challenges and coping strategies highlighted above, as well as the socioeconomic factors that influence and predict them, interact in a complex and multidimensional way. There have been considerable research efforts made to analyse and evaluate these complexities and interacting factors in a bid to provide practical information to guide policy development and implementations targeted at addressing food insecurity in rural South Africa. However, due to variability in how these socioeconomic factors respond in different social, cultural, and community settings, a one-solution-for-all cannot be applied in addressing food insecurity across South Africa. In this case, there is a need to evaluate these issues and concepts within each specific community/province in addressing food insecurity.

CHAPTER 3

Food insecurity challenges and coping strategies adopted by rural households: a case study of North-West Province.

Abstract

Although South Africa is considered a food secure nation, food insecurity remains a challenge at individual and household levels. Data sourced from the Indigenous Knowledge System South Africa (iKSSA), collected in 2019 was used to determine and describe the food insecurity-related challenges and coping strategies faced and used by households in North-West Province of South Africa. Descriptive statistics were generated to describe the characteristics of the sample (households). The results showed that food purchases served as the major source of food commodities consumed. Major household challenges included an increase in food prices, an increase in the cost of food production, and an increase in household size, while the most common shock incidences were the death of livestock, drought, injury or chronic illness, and theft. The major coping mechanisms were associated with adjustments to household eating patterns, which involved relying on less expensive food with less variety, reducing the number of meals per day, as well as using savings as an alternative source of financing food purchases. The recommendation is for the formulation of appropriate holistic policies targeted towards helping rural households in North-West Province to improve household income through job creation, acquisition of basic agricultural skills, and encouraging rural dwellers, through rural extension and development initiatives, and provision of farm inputs to increase food production.

3.1 Introduction

Food insecurity exists when there is a lack of secure or stable access to sufficient, safe, and nutritious food. In other words, food insecurity is a situation in which people experience limitations or uncertainties with regard to physical, social, and economic access to safe, enough and nutritious food to meet their dietary desires for a healthy and active life (Asesefa Kisi *et al.*, 2018). Household food insecurity remains a global challenge, with most African countries being worse affected (Brander *et al.*, 2021; Chakona and Shackleton, 2019; Cochrane, 2017; Devereux and Tavener-Smith, 2019; García-Díez *et al.*, 2021). Although governments, non-government organisations, and corporate entities have contributed at alleviating household food and nutritional insecurity, some households still experience acute food shortages (de Beer *et al.*, 2020). Despite that South Africa is considered a food secure nation, food insecurity remains a challenge at individual and household levels (Hendriks, 2014; Ijatuyi *et al.*, 2018; Stats SA, 2019c). Recent survey data demonstrated that 93.6%, 84.0%, and

66.5% of households in Limpopo, Gauteng, and Northern Cape, respectively, reported adequate food access while 64.0% reported access to adequate food in North West Province (Stats SA, 2019c). This indicates that well over 36.0% of households in North-West Province experience food insecurity. These statistics indicate that North-West Province is among the least food secure provinces in South Africa. According to the same report (Stats SA, 2019c), 29,6% of households with more than three children indicated inadequate food access. are on the increase in the number of households that are food and nutritional insecure in most provinces is among other factors, due to increased urbanisation, land issues, political instability, economic inequality, and poverty. (Chakona and Shackleton, 2019; de Beer *et al.*, 2020; Earl, 2011; Jacobs, 2010; Ngidi and Hendriks, 2014).

Using data sourced from the Indigenous Knowledge System South Africa (iIKSSA) this study identified the food insecurity-related challenges experienced by households in North-West Province, and the coping strategies they adopted to ensure food adequacy and mitigate food insecurity.

3.2 Challenges of Food Security and Coping Strategies used by Households.

In South Africa, households face many challenges to have access to sufficient, safe, and nutritious food. These challenges associated with the four elements of food security, which are availability, accessibility, utilisation, and stability (Hendriks, 2014; Mkhawani *et al.*, 2016; Mthethwa and Wale, 2021; Walsh and van Rooyen, 2015). In terms of food availability, household food security is threatened by limitations in food supply due to factors such as poor infrastructure for transportation and logistics, seasonal scarcity and low agricultural outputs, (Vasuthevan and Mthembu, 2016; Frayne and McCordic, 2015). On the other hand, household food accessibility in South Africa is hampered by economic and social factors, such as rising food prices, over-reliance on purchased goods, unemployment, and poverty (Hendriks, 2005; Drimie *et al.*, 2009; Dodd and Nyabvudzi, 2014; Drysdale *et al.*, 2019; Mkhawani *et al.*, 2016; Plagerson, 2021). Low household monthly income, poverty, and income inequality are some challenges that negatively affect food utilisation and stability. These factors are, however, linked to the socioeconomic status of households, especially in rural areas (Chakona and Shackleton, 2017; Chopra *et al.*, 2009; de Beer *et al.*, 2020). Poor households are limited to monotonous diets since they do not have the financial power to purchase different varieties of foods consistently to ensure a nutritional balanced diet (Arimond *et al.*, 2010; Kennedy, 2009) hence leading to malnutrition (Chakona and Shackleton, 2017; Chakona and Shackleton, 2019).

There have been several coping strategies identified in empirical literature that food-insecure households adopt to cope with lack of food. According to de Beer *et al.* (2020) some of these strategies

are grouped into two categories. The first category se are the negative coping strategies that include reducing portion size, skipping meals, and switching to cheaper sources of food. The second one category are the positive coping strategies that comprise self-food production collecting wild food alternatives, community animal rearing, and community gardens. In some cases, households may look for alternative income sources such as engaging in menial jobs, agricultural activities, getting loans and selling household assets (Stats SA, 2019c; Drysdale *et al.*, 2019; Ngidi and Hendriks, 2014).

3.3. Methodology

3.3.1. Study area

This study focused on the North-West Province of South Africa. According to the 2019 mid-year population estimates for South Africa by province, North West Province's population was at 4.02 million (Stats SA, 2019b), with an estimation of 1.2 million households having the average household size of three persons (Stats SA, 2018).

3.3.2. Sampling

The application of two-stage cluster sampling was to select villages, and further select households, as the ultimate sample from each stratum. Households within the villages remain the ultimate sampling unit, and there were 170 households sampled.

3.3.3. Data collection

This study used data collected by the iKSSA via household surveys and focus group discussions. The instrument of data collection was a structured questionnaire developed based on a pre-study of the household food security status. The structured questionnaire collected relevant information at the household level.

3.3.4 Statistical analysis

Descriptive statistics, such as mean, percentage and frequency, described households' food sources, and feeding patterns, and explored the household challenges and shock incidences associated with food security, as well as the coping mechanisms to ease food insecurity in the study area. Data processing and computation used Statistical Package for Social Sciences (SPSS) version 25 (IBM Corporation, Chicago, IL, USA) for analysis.

3.3.5. Limitations of the study

This study employs secondary data to analyse the socioeconomic variables that influence coping strategies in the study area. The findings of the study must be taken with caution as they may not

reflect the current situation on the ground, as the socioeconomic factors phenomena are dynamic and change with time.

3.4 Results and Discussion

3.4.1 Households' food types by food sources

Table 3.1 shows the percentage of households' food types by food sources. The results show that food purchases and home gardening constitute high percentage of food sources for the households. The finding of the current study that food purchases are the main source of food is consistent with other previous reports (Baiphethi and Jacobs, 2009; Chakona and Shackleton, 2017). The implication of finding of the current study is that households' food security status and keeps on worsening. This is because most South African rural households fall within the low-income earning group and are live below the poverty line (De Cock *et al.*, 2013; Devereux and Tavener-Smith, 2019). With low income, there is a limitation on food diversity that households require for a nutritionally balanced diet. Because households purchased most food items, an increase in the prices of the food commodities threatens food adequacy hence affecting food security status among the households. These findings are in line with previous reports that reported strong links between food prices, household income, and food insecurity (Hendriks, 2014; Frayne and McCordic, 2015; Mthethwa and Wale, 2021; Taruvinga *et al.*, 2013; Cheteni *et al.*, 2020). The findings of the current study, therefore, underscores, the importance of households' purchasing power and income in ensuring food security (Hendriks, 2014; De Cock *et al.*, 2013; Cheteni *et al.*, 2020).

Table 3.1. Households' food types by sources

Food type	Home Garden	Bought	Battering	Food Parcel	Credit	Borrowed	Gift	Total
Maize	3.3	91.7	0.8	0.8	3.3	-	-	100
Cereal	-	100	-	-	-	-	-	100
Fruit and vegetable	25.8	72.5	-	-	-	1.7	-	100
Red meat	12.5	80.8	5.0	-	0.8	0.8	-	100
Eggs	18.3	76.7	-	-	0.8	4.2	-	100
Dairy	8.3	91.7	-	-	-	-	-	100
Beverages	0.8	95.8	-	-	0.8	0.8	1.7	100

Regarding the frequency of consumption for each food, type in the results show that maize was the most consumed food type by all the households. In table 3.2 below, while beverages were the least consumed. The low percentage of households that consumed beverages is consistent with the behaviour of low-income households' earners that view beverages as luxury food and that they may not afford them.

Table 3.2 depicts the frequency of consumption of different food types over seven days. The results in the table revealed that consumption of red meat, eggs and dairy products was low as only 35% of the households reported consuming them in the last seven days.

Food type							
	1-day	2-days	3-days	4-days	5-days	6-days	7-days
Maize	100	0.8	6.7	12.5	6.7	9.2	62.5
Cereal	14.2	14.2	13.3	7.5	7.5	4.2	39.2
Fruit and vegetable	27.5	42.5	15.0	3.3	4.2	-	7.5
Red meat	34.2	38.3	13.3	10.0	1.7	0.8	1.7
Eggs	30.8	30.0	14.2	3.3	6.7	5.8	9.2
Dairy	20.8	26.7	11.7	3.3	1.7	1.7	34.2
Beverages	3.3	1.7	2.5	0.8	4.2	3.3	84.2

Table 3.2: Household's food type by number of days consumed.

3.4.2 Household challenges and shock incidences associated with food security.

Table 3.3 shows the frequencies and percentages of responses to questions about household food security challenges. Of the 170 sampled households, 69.17% indicated they had experienced increases in food costs in the last 12 months. High food prices are a limitation to achieving household food security in rural settlements (Mkhawani *et al.*, 2016; Sikuka, 2021; Faber and Drimie, 2016). The increase in food costs was also found to influence household eating habits and dietary diversity (Mkhawani *et al.*, 2016). Other notable household shock incidences include an increase in food production costs, death of livestock, and an increase in household size, as reported by 31.67%, 29.17%, and 25% of the households, respectively. High costs of food production and the death of livestock may limit the ability of households to earn more income or provide more food to achieve food security through engaging in agricultural production. Also cited by the households were natural disasters, such as sickness, flooding, storms, and drought. For example, the drought, which was

experienced in 2015 and 2016, was a major natural cause of increase in food insecurity levels in iLembe which triggered water rationing and food price inflation (Drysdale *et al.*, 2021). The findings in this study reiterate the potential of natural disasters affecting household food security. Other results showed that loss of employment, government grants, and foreign remittances were cited by 7.5%, 4.17%, and 1.67% of the sampled households, as the challenges they had experienced in the last 12 months.

Household challenge/Shock incidence	Frequency (N)	Percentage (%)
Increase in household size	30	25
Increase in food production costs	38	31.67
Cut-off or decrease in government grant	5	4.17
Flood	2	1.67
Storm	10	8.33
Drought	24	20
Serious injury or chronic illness	20	16.67
Loss of job in the household	9	7.5
Loss of remittances	2	1.67
Loss of possessions, theft	16	13.33
Death of livestock	35	29.17
Increase in food cost or food price	83	69.17

Table 3. 2. Household challenges associated with food security in North-West (n=170)

4.3 Households coping mechanisms for food insecurity and shortage

The commonly adopted coping mechanisms to food insecurity were grouped into three broad categories and these are: (i) adjusting household eating patterns; (ii) adjusting source of food; (iii) alternative source of income. The results in Figure 3.1 showed that adjusting the household feeding pattern was the most important and widely adopted coping mechanism with 90.8% of the total households, indicating they employed the coping method.

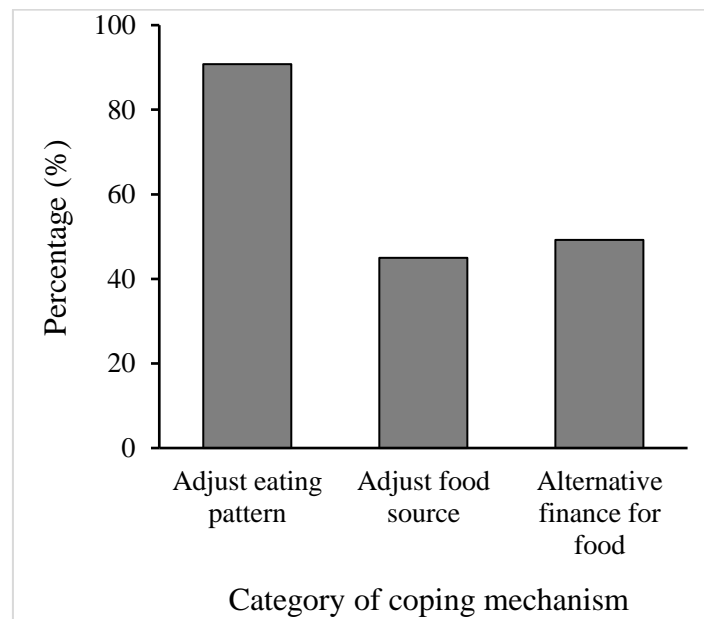


Figure 3. 1: Categories/patterns of coping strategies adopted by households

Note: Percentages denoted those who admitted using the indicated coping methods within the category in the sample

However, within each category, the rate of application of coping methods varied (Table 3.4). With respect to adjusting to feeding patterns, reliance on less expensive food was the most important and applied coping method, as indicated by 79.17% of the households. This is in agreement with observations by Mkhawani et al. (2016), who noted that poorer households switch to cheaper or less nutritious food to cope with food insecurity posed by rising food prices. Several reports have cited adjusting eating patterns and food sources as a common coping strategy for dealing with food insecurity albeit in the short term (Cordero-Ahiman *et al.*, 2018; Drysdale *et al.*, 2019; Ngidi and Hendriks, 2014).

The use of savings to buy food was the most used coping approach associated with seeking alternative sources of income to procure food, where 40% of the households cited using this method. Although not specifically highlighted, respondents may have viewed income from alternative sources such as, agricultural activities as savings used to purchase food. Secondary income from farming activities was identified as a means of financing food purchase in severe food shortages (Stats SA, 2019c). Finally, 12.5% and 1.67% indicated to have defaulted loans/credit payments and sold their assets, respectively, to buy food.

Coping mechanisms	Frequency (N)	Percentage (%)
Adjusting household eating pattern		
Relied on less expensive food	95	79.17
Consumed less variety	56	46.67
Limited portion size of meal	42	35
Fed only working members of household	0	0
Reduced number of meals eaten in a day	49	40.83
Skipped a meal	27	22.5
Went entire days without eating	3	2.5
Restricted consumption by adults for children to eat	19	35
Adjusting source of food		
Borrowed or rely on help for food	25	20.83
Purchased food on credit	30	25
Gathered wild food and hunting	18	15
Sent household members to eat elsewhere	5	4.17
Sent household members to beg	6	5
Alternative source of income		
Used part of savings to buy food	48	40
Sold assets to buy food	2	1.67
Skipped loan/credit payment	15	12.5

Table 3. 3. Household coping mechanisms against food insecurity in North-West (n=170)

As evidenced above, the coping methods associated with changes to eating patterns were the most adopted coping mechanism. This may be because and changing consumption patterns is a quick and temporary measure that households can use to address food inadequacy while working towards a long-term solution. The fact that households relied on borrowed food, bought food on credit, and used savings served as a major alternative source of money for food further reflects the low-income status of the households in this study. Hence, addressing low income and poverty among rural households are viable options to tackling food insecurity in the area.

Provision of extension services could help affected households with cost-effective and good agricultural practices. Previous studies also observed that extension services have far-reaching

impacts on helping rural dwellers achieve food security through improved agricultural production (Danso-Abbeam *et al.*, 2018; Maiangwa *et al.*, 2010; Ngidi and Hendriks, 2014; Ngomi *et al.*, 2020)

Intervention programmes, such as the Comprehensive Agricultural Support Programme (CASP), the Agriculture and Land Reform Policy (ALRP), and the South Africa Integrated Food Security Strategy (SAIFSS) (Bahta *et al.*, 2018) are critical in sustaining food security. The Homestead Food Garden programmes have also demonstrated to be a viable driver of ensuring sustainable household food security (Mkhwanazi, 2016). However some of the challenges highlighted in the current study have been noted by others (Oguttu *et al.*, 2021; Bahta *et al.*, 2018) as affecting the success of these intervention programmes..

3.5 Chapter Summary

The analysis shows that households relied mainly on the purchase of food as their source. Inflation in prices of food stands as a major challenge, therefore making household income status a significant determinant of food security status. Also, shock incidences that limit agricultural production further limit the chances of coping through agricultural activities. These pose a severe threat to household food security since most rural households in South Africa fall within the low-income earning group and live below the poverty line. To address these issues, dealing with low income and poverty are viable options for tackling food security in the area. Government intervention strategies, targeted at addressing food insecurity, should be approached via multidimensional initiatives that focus more on improving household income through job creation, acquisition of basic agricultural skills and encouraging rural dwellers through rural extension, development initiatives, and provision of farm inputs to adopt food production. The recommendation is for the conducting of further studies that employ primary data sourced from the same representative sample population to enable the analysis of the current situation, as these socioeconomic phenomena are quite dynamic and they morph with time, especially with the current post-COVID-19 realities. Future studies should consider how government interventions on food insecurity influence household coping strategies.

CHAPTER 4

Investigating socio-economic factors influencing rural households in managing food insecurity.

Abstract

Household food insecurity persists among rural dwellers in most South African provinces. There are a diverse group of strategies employed by affected individuals and households to cope with inadequate food. However, many limitations hinder the coping strategies, which further deepens the threat to the food security status of villagers who adopt them. This chapter evaluates the challenges that militate against rural households, thereby limiting the effectiveness of coping strategies employed by food-insecure rural dwellers in North-West Province. The results revealed 23.33% of households faced the threat of food insecurity and there was a wide economic inequality, as shown by income distribution. Also, education level, household income, access to land, and access to extension services were predicting factors of agricultural production as a coping strategy; access to grants was the only socioeconomic factor positively influencing the consumption of wild foods; access to land was the sole factor influencing reliance on less expensive foods; household income and access to the extension were predictors of using savings to buy food; buying food on credit was determined by household size, household types (living in shacks), and access to land. The recommendation is for policy interventions that address income inequality and poverty through support for rural agricultural production and improvement to access to arable land for rural dwellers.

4.1 Introduction

South Africa can meet local demand for food for her 60 million-plus people through local production and importation. At the national level, the country can be considered to be food secure (*Ijatuyi et al.*, 2018; Stats SA, 2019c). However, household food insecurity persists especially, among rural dwellers (*Mkhawani et al.*, 2016; Devereux and Tavener-Smith, 2019; Dodd and Nyabvudzi, 2014; Earl, 2011; Mthethwa and Wale, 2021). According to an Integrated Food Security Phase Classification (IPC) report (IPC, 2021), 16% of the population of South Africa, was facing high levels of acute food insecurity between September – December 2020. The inability to access safe, sufficient, and nutritious food consistently by rural dwellers is fostered by several factors, especially those associated with food availability and access (IPC, 2021; Dodd and Nyabvudzi, 2014). Among these limitations, economic access to food is a major contributor to food insecurity. This is because most South African rural households have slow financial status of (Mthethwa and Wale, 2021; Mkhawani *et al.*, 2016). High unemployment rates, low wages, rapid food price inflation, economic inequality, and economic

downturn are responsible for the limited economic access to food (Dodd and Nyabvudzi, 2014; Earl, 2011; Jacobs, 2010; Stats SA, 2019a; Sikuka, 2021).

North-West is one of the South African provinces with a relatively high percentage of rural households experiencing inadequate availability of food (Stats SA, 2019c; Ijatuyi *et al.*, 2018; IPC, 2021). Approximately 15% of the population faced high levels of acute food insecurity while 25% of households were classified as in stress with respect to food security in the period under analysis (September – December 2020) (IPC, 2021). The projection was that over 25% of North West population would face high levels of acute food insecurity by the first quarter of 2021 (IPC, 2021).

Owing to the recurring occurrence of food insecurity there has been a diverse of strategies that individuals and households use to cope with lack of food or inadequate food. These include, switching diets and food rationing, borrowing money or food gathering food from the wild or natural sources, producing own food, alternative sources of income, and social grants (Ngidi and Hendriks, 2014; Drysdale *et al.*, 2019; Chakona and Shackleton, 2019). These coping strategies also face many limitations, which further deepens the threat to the food security status of villagers who adopt them. In this chapter, we evaluate the challenges that militate against rural households, thereby limiting the efficiencies of the coping strategies employed by food-insecure rural dwellers in North-West Province.

4.2 Food Insecurity Coping Strategies, Socioeconomic Determinants, and Challenges

Coping mechanisms are basic processes integral to adaptation and survival. These strategies depict how people detect, appraise, deal with, and learn from stressful situations (Skinner and Zimmer-Gembeck, 2016). When individuals or households encounter difficulties or uncertainties in securing food, they devise ways to ensure access to food through one or a combination of strategies. Coping methods may range from short-term behaviours, such as small dietary changes, skipping meals, eating less expensive alternatives, and collecting food from natural sources, to long-term seeking alternative source of income, production of own food via subsistence farming, and social grants (Walsh and van Rooyen, 2015; Hendriks, 2005; Drysdale *et al.*, 2019; Earl, 2011; Chakona and Shackleton, 2019). Some more extreme behaviours, such as selling assets, borrowing food or money have also been adopted as strategies for coping with food insecurity (Drysdale *et al.*, 2019). Different individuals and households adopt varying coping strategies. The strategies vary among communities thus highlighting the significance of the variations in household response to food shock in different settings. In this case, there is need to understand community specific conditions in the development and implementation of intervention programmes (Drysdale *et al.*, 2019; Walsh and van Rooyen, 2015).

Some challenges may work against coping methods, thereby reducing their effectiveness in helping individuals or households alleviate the threats of food inadequacy. For instance, subsistence agriculture is a common coping method in rural societies (Walsh and van Rooyen, 2015)(Ijatuyi *et al.*, 2018, Stats SA, 2019c). However, the effectiveness of this coping strategy can be a limited by inadequate arable land, drought/climate change, or lack of farming inputs (Masipa, 2017; Ansah *et al.*, 2021; Chakona and Shackleton, 2017; Chakona and Shackleton, 2019). Where individuals or households rely on the collection of wild foods (Chakona and Shackleton, 2019), seasonality may constitute a problem since wild plants do not always fruit all year round. The lack of direct access to forests, or natural sources of food, means this option -limits urban dwellers from utilizing it. Furthermore, the effectiveness of financial support or aid, social grants, and menial jobs as coping strategies (de Beer *et al.*, 2020; Chakona and Shackleton, 2019) may be severely compromised with prevalence in rising food prices and inflation (Jacobs, 2010). While research have identified all the possible strategies that individuals and households employ to cope with food inadequacy and insecurity, there is little attention that has been paid on how household socioeconomic status and factors influence the coping strategies in alleviating food insecurity. This study seeks to determine the factors that influence the choice of coping strategies.

4.3 Methodology

4.3.1 Research design and approach

This study employed a descriptive research design since it sought to describe a phenomenon and its characteristics (Nassaji, 2015), i.e., household food insecurity, the challenges and coping strategies. To achieve these, this study adopted a quantitative research approach which allows the utilisation and analysis of numerical data using specific statistical techniques to answer questions (Apuke, 2017).

4.3.2 Study area

This study focused on the North-West Province of South Africa. According to the 2019 mid-year population estimates for South Africa by province, North West Province's population was at 4.02 million (Stats SA, 2019b). The estimated number of households in the province was 1.2 million with an average household size of three (Stats SA, 2018).

4.3.3 Sampling

The application of two-stage cluster sampling was to select villages and then households, as the ultimate sample from each stratum. Households within the villages remain the ultimate sampling unit, and there were 170 households sampled.

4.3.4 Data collection

This study used secondary data collected by the iKSSA via focus group discussions and household surveys. The data collection instrument, a structured questionnaire developed based on the knowledge of household heads and their food security status, collected relevant information at the household level.

Computation of Household Dietary Diversity Score (HDDS), i.e., the number of unique foods consumed by household members over a given period (Cheteni *et al.*, 2020), for each household was transferred to a Microsoft Excel spreadsheet. For each household, HDDS was determined by adding up the number of unique food groups consumed by a household over a 24-h recall period (Taruvunga *et al.*, 2013).

Food security status for each household was derived from their respective HDDs by recoding, as described by Cheteni *et al.* (2020), with slight modifications. Households that consumed nine or more food groups were said to be food secure while those that consumed eight or fewer food groups were said to be food insecure. Since HDDs does not indicate the quantity of food consumed by each household, we estimated Household Food Consumption Score (HFCS), which is a frequency

weighted HDDS (Crush and Caesar, 2014), using the frequency of consumption of the food groups consumed, as presented in Equation (1). Food consumption levels were derived from Food Consumption Score (FCS) by coding as follows: 0 – 21 (poor), 21.5 – 35 (borderline), and above 35 (acceptable) (Cheteni et al., 2020).

$$\text{FCS} = (\text{starches} \times 2) + (\text{legumes} \times 3) + \text{vegetables} + \text{fruit} + (\text{meat} \times 4) + (\text{dairy} \times 4) + (\text{fats} \times 0.5) + (\text{sugar} \times 0.5) \quad (1)$$

4.3.5. Statistical analysis

The data for this study were analysed through descriptive and inferential statistics. There were descriptive statistics applied to socioeconomic characteristics of respondents and a binary regression analysis ascertained the association of variables. All data were captured and coded on Microsoft Excel 2016 and then transferred to Statistical Package for Social Sciences (SPSS).

A typical logistic regression model, used to determine if the probability of a dichotomous outcome is influenced by a set of explanatory independent variables (Ijatuyi et al., 2018), was employed. The binary logistic regression model is as per equation (2):

$$\text{Logit}(Y_i) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \mu_t \quad (2)$$

where, Y_i is a binary dependent variable, which is 1 if respondents affirm using the coping mechanism, and 0 if otherwise. β_0 is the intercept (constant); β_1 , β_2 , to β_n are the regression coefficients of predictor variables, X_1 , X_2 , and X_n , respectively; and μ_t , the error term.

4.3.6. Limitations of the study

This study employed a secondary data set to analyse the socioeconomic variables that influence coping strategies in the study area. The researcher cautions that the findings from the study may not reflect the current situation on the ground as these socioeconomic phenomena are dynamic and they change with time.

4.4. Results and discussion

4.4.1. Socioeconomic characteristics of households

Table 4.1 presents the socioeconomic characteristics of households. There were 52% of the households headed by fathers, 32.5% by mothers, while 4.2% of the households had a grandfather and 2.5% had a grandmother as the head of the household. Most (59.3%) of the household types fell in the undefined “others” category, with shacks, rural development programme homes, and three-

bedroom households representing 13.6% each. Household size within the study area largely comprised of five or few members, as indicated by 63% of households, 30% of households had between six and 10 members, while only 3.3% of households had more than 10 members. Concerning households' literacy status, the study indicated that 80% of the respondents had access to some level of formal education. On occupation, 58.3% of the respondents indicated to be unemployed, while 22.5% had formal employment and 16.7% were self-employed. In terms of household income, the results show that 22.5% earn less than R2000, 25.8% earn between R2000 and R4000, while 34.2% of the respondents earn above R10000. Notable socioeconomic challenges in the study area are a high rate of unemployment (58.3%) and low household income (indicate percentage), and wide economic inequality (as shown by the distribution and concentration of households in the extremes of income levels).

Table 4.1. Socioeconomic characteristics of households in the sampled households.

Variables	Frequency (N)	Percentage (%)
<i>Household head</i>		
Father	63	52.5
Mother	39	32.5
Child	9	7.5
Grandfather	5	4.2
Grandmother	3	2.5
Uncle	1	0.8
<i>Household type</i>		
Shack	16	13.6
Rural development program	16	13.6
Three-bedroom house	16	13.6
Others	70	59.3
<i>Household size</i>		
1 – 5 members	75	63
6 – 10 members	36	30
11 and above	4	3.3
<i>Highest educational qualification</i>		
No formal education	24	20.0
Completed Primary School	28	23.3
Some High school	31	25.8
Completed High school	23	19.2
Some tertiary education	10	8.3
Completed tertiary education	4	3.3
<i>Occupation</i>		
Employed	27	22.5
Unemployed	70	58.3
Self-employed	20	16.7
<i>Household Income (R)</i>		
0 – 1999	27	22.5
2000 – 3999	31	25.8
4000 – 5999	6	5.0
6000 – 7999	6	5.0
8000 – 9999	9	7.5
10000 and above	41	34.2

Indicate the source of information in the Table

4.4.2 Household dietary diversity, food consumption, and food security level in the study area

The proportion of households with high dietary diversity was at 76.67%. Only 7.5% of households fell into the lower dietary diversity group, while 15.83% were in the moderate dietary diversity group (Figure 4.1A). Based on the categorisation of household food consumption scores, 64.17% of the total sampled households were within acceptable food consumption levels, 19.17% were on the borderline, and 16.67% had poor food consumption levels (Figure 4.1B). Each household's food security status came from their respective dietary diversity score, and this revealed that 75.83% of the sampled households were food secure, while the rest were facing food insecurity (Figure 4.1C).

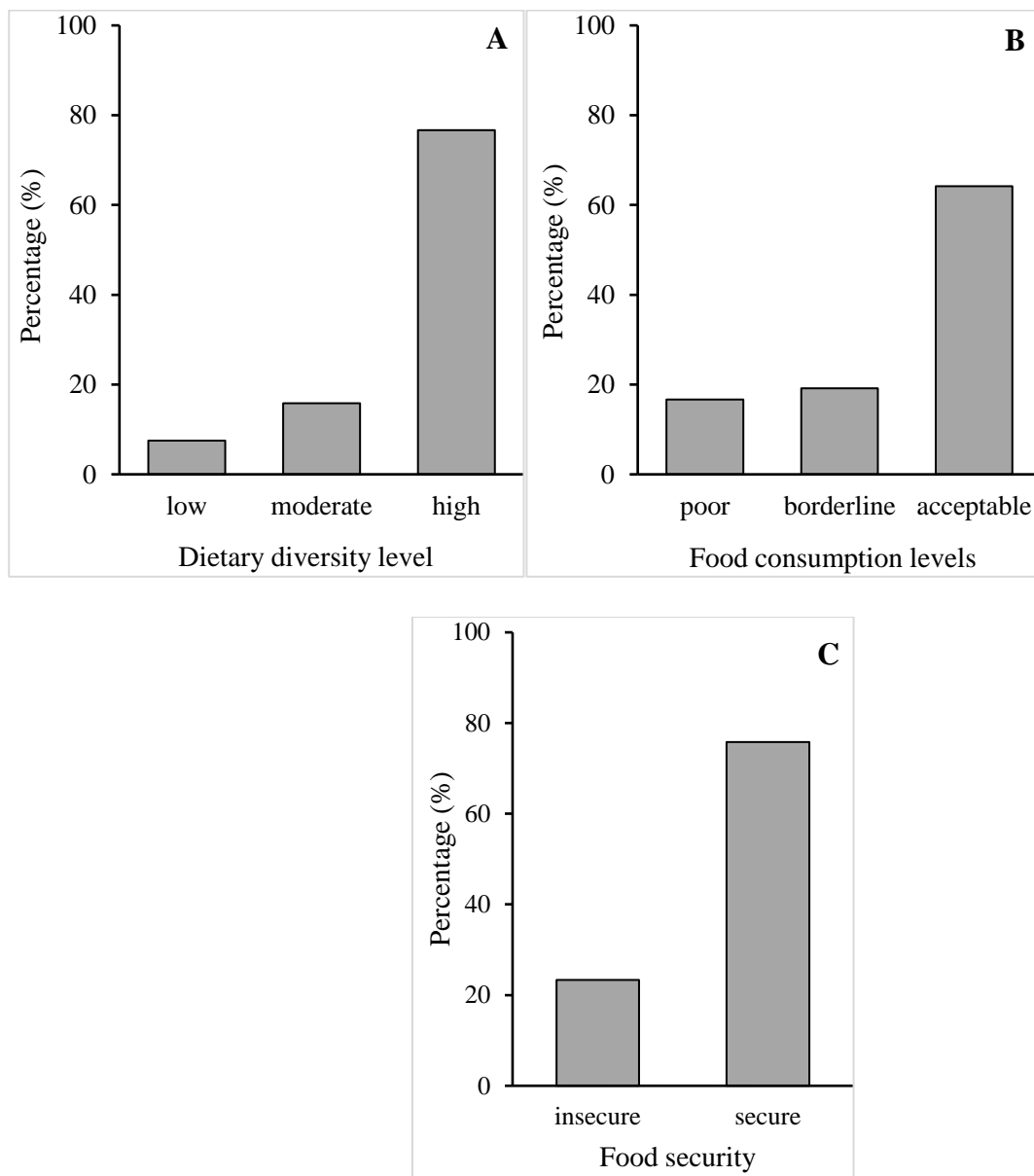


Figure 4. 1: Households' dietary diversity levels, food consumption and extent of food security

4.4.3. Socioeconomic determinants of food insecurity coping strategies

Important coping strategies commonly adopted by households, identified in the previous chapter (indicate the chapter), including agricultural production, collection of food from the wild, reliance on less expensive foods, using savings to buy food, and purchasing food on credit. Here, a binary logistic model determined the socioeconomic factors that influence the choice and use of these coping strategies in the study area.

4.4.3.1. *Agricultural production*

Households whose heads lacked formal education or those who completed tertiary education were likely to engage in agricultural production. This finding supports the view that lack of formal education leaves rural dwellers little choice to formal employment, thus they engage in farming, while educated rural dwellers engage in farming as a source of income (Oduro-Ofori *et al.*, 2014). The coefficient and p -value (0.015) observed for household income suggest this variable has a positive and statistically significant relationship with agricultural production. Access to land was significantly ($p < 0.05$) and positively related to agricultural production. Similarly, access to extension services showed a significant and positive relationship with agricultural production. The findings in the current study that access to land and extension programmes enhanced farm productivity, household income and hence food security is consistent with existing empirical evidence (Ngomi *et al.*, 2020; Maiangwa *et al.*, 2010; Maxwell, 1995; Muraoka *et al.*, 2018). The land is a primary requirement for agricultural activities, and extension programmes help rural dwellers acquire the best agricultural practices and skills that enable them to put the available resources to maximum use, thereby, enhancing agricultural productivity.

A decrease in food consumption score and access to grants increased the likelihood of engaging in farming. These were expected as producing own food for household consumption has been and observed to be a viable coping strategy for dealing with food insecurity (reference). In the absence of grant, own food production can serve as an alternative coping mechanism (Chakona and Shackleton, 2017; Chakona and Shackleton, 2019). It was expected that the increase in food prices would influence people to engage in food production (Mkhawani *et al.*, 2016; Baiphethi and Jacobs, 2009), but this was not the case in this study area. This could be due to constraints such as low income and the inability to access land and extension services.

Table 4.2. Binary logistic model of socioeconomic factors influencing agricultural production as a coping method in North-West Province

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Food security status	0.833	1.052	0.626	1	0.429	2.299
Food consumption score	-0.013	0.024	0.272	1	0.602	0.987
Access to grant	-0.392	0.980	0.160	1	0.690	0.676
Educational status			5.618	5	0.345	
No formal education	3.392	1.806	3.528	1	0.060*	29.737
Primary School	2.325	1.624	2.050	1	0.152	10.228
High School	1.625	1.624	1.002	1	0.317	5.078
Some Tertiary	1.003	1.708	0.345	1	0.557	2.728
Tertiary education	3.193	1.827	3.055	1	0.080*	24.363
Household size	0.139	0.184	0.572	1	0.450	1.149
Employment status	0.305	0.783	0.151	1	0.697	1.356
Type of Household			2.112	3	0.549	
Shack	0.170	1.133	0.022	1	0.881	1.185
RDP	-0.450	0.947	0.226	1	0.634	0.637
3-Bedroom	1.635	1.261	1.681	1	0.195	5.131
Household income	0.000	0.000	5.894	1	0.015**	1.000
Household head			3.192	5	0.670	
Father	20.056	2.644E4	0.000	1	0.999	5.129E8
Mother	19.125	2.644E4	0.000	1	0.999	2.022E8
Grandfather	19.915	2.644E4	0.000	1	0.999	4.456E8
Grandmother	17.157	2.644E4	0.000	1	0.999	2.826E7
Uncle	18.551	2.644E4	0.000	1	0.999	1.14E8
Access to land	2.005	0.800	6.280	1	0.012**	7.426
Household financial asset	1.622	1.506	1.159	1	0.282	5.061
Access to extension	4.032	0.915	19.433	1	0.000***	56.355
Increase in food price	-1.230	0.849	2.100	1	0.147	0.292
Constant	-25.711	2.644E4	0.000	1	0.999	0.000
Number of observations	120					
-2 Log likelihood	74.476					
Cox & Snell R^2	0.511					
Nagelkerke R^2	0.681					
Hosmer and Lemeshow (χ^2)	5.092 (df = 8; p-value = 0.748)					
Omnibus Tests of Model Coefficients (χ^2)	79.394 (df = 23; p-value = 0.000)					
Overall model prediction (%)	82.0%					

Significant at 10%, 5%, and 1% significance levels are in bold and tagged with *, **, and ***, respectively.

4.4.3.2 Collection of wild food

Table 4.3 illustrates the logistic regression analysis of the relationships between socioeconomic factors and the collection of wild food, as a strategy for coping with food insecurity. Acquisition of foods from natural sources as a coping strategy was found to be significant and inversely related to food security. In contrast, food consumption scores and access to grants were significant and positively related to collecting foods from natural sources to cope with food insecurity.

As observed by Chakona and Shackleton (2019) and Ncube *et al.* (2016), and consistent with the findings of the current study, consumption of wild food is a viable coping strategy for alleviating threats of food insecurity. The findings in this study that a high food consumption score increased the likelihood that households would consume wild food and the inverse relationship between food security status and consumption of wild food are in contrast with this view. The consumption of wild food is very common in rural areas in South Africa (Ncube *et al.*, 2016; Arnold *et al.*, 2011; Shackleton and Shackleton, 2004) and that may explain our observation in the current study.

Table 4.3. Binary logistic model results of food security parameters and socioeconomic factors influencing the collection of wild food as a coping strategy in North-West Province

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Food security status	-1.988	1.026	3.752	1	0.053*	0.137
Food consumption score	0.042	0.023	3.184	1	0.074*	1.042
Access to grant	1.452	0.851	2.912	1	0.088*	4.272
Educational status			5.783	5	0.328	
No formal education	20.569	1.882E4	0.000	1	0.999	8.572E8
Primary School	19.704	1.882E4	0.000	1	0.999	3.61E8
High School	18.083	1.882E4	0.000	1	0.999	7.137E7
Some Tertiary	19.605	1.882E4	0.000	1	0.999	3.267E8
Tertiary education	18.545	1.882E4	0.000	1	0.999	1.133E8
Household size	-0.092	0.136	0.456	1	0.499	0.912
Employment status	0.310	0.775	0.160	1	0.690	1.363
Type of Household			1.959	3	0.581	
Shack	-1.107	1.385	0.638	1	0.424	0.331
RDP	0.576	1.077	0.286	1	0.593	1.778
3-Bedroom	-1.236	1.291	0.916	1	0.339	0.291
Household income	0.000	0.000	0.426	1	0.514	1.000
Household head			3.577	5	0.612	
Father	18.282	2.667E4	0.000	1	0.999	8.707E7
Mother	16.448	2.667E4	0.000	1	1.000	1.39E7
Grandfather	18.552	2.667E4	0.000	1	0.999	1.14E8
Grandmother	17.526	2.667E4	0.000	1	0.999	4.085E7
Uncle	-3.007	3.865E4	0.000	1	1.000	0.049
Access to land	-0.257	0.750	0.117	1	0.732	0.773
Household financial asset	0.670	1.571	0.182	1	0.670	1.954
Access to extension	-0.510	0.752	0.460	1	0.498	0.601
Increase in food price	0.021	0.799	0.001	1	0.979	1.021
Constant	-39.826	3.265E4	0.000	1	0.999	0.000
Number of observations	120					
-2 Log likelihood	69417					
Cox & Snell R^2	0.181					
Nagelkerke R^2	0.322					
Hosmer and Lemeshow (χ^2)	9.422 (df = 8; p -value = 0.308)					
Omnibus Tests of Model Coefficients (χ^2)	22.139 (df = 23; p -value = 0.512)					
Overall model prediction (%)	88.3%					

Significant at 10%, 5%, and 1% significance levels are in bold and tagged with *, **, and ***, respectively.

4.4.3.3 *Reliance on less expensive food*

Table 4.4 illustrates the outcome of logit regression analysis of the relationships between socioeconomic factors and reliance on less expensive food, as a food insecurity coping method. Access to land was the only significant ($p < 0.05$) determinant of household adoption of eating less expensive foods to cope with food insecurity, with a positive (1.761) relationship. Although statistically insignificant, reliance on less expensive food showed inverse relationships with food security status (-0.403), food consumption score (-0.001), educational status (3 & 4), household size (-0.099), all categories of household heads, and ownership of assets (-19.693). Increase in food price, as expected, was also positively (1.096), but not significantly, related to reliance on less expensive food.

The observations in this study further support the previously reported reliance on less expensive foods as food security indicators tend towards negative (Farzana *et al.*, 2017; Aseseffa Kisi *et al.*, 2018). Reliance on less expensive foods is a coping strategy associated with dietary adjustment and widely reported as a commonly adopted coping strategy for dealing with food insecurity (Aseseffa Kisi *et al.*, 2018). The observed positive relationship between increase in food price and reliance on less expensive food is in line with the fact that households adjust their feeding patterns to deal with food shortage, including consuming less expensive foods (Mkhawani *et al.*, 2016; Aseseffa Kisi *et al.*, 2018), as the prices of food commodities increase.

Table 4.4. Binary logistic model of food security parameters and socioeconomic factors influencing the reliance on less expensive food as a coping method in North-West Province

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Food security status	-0.403	1.095	0.136	1	0.713	0.668
Food consumption score	-0.001	0.023	0.002	1	0.963	0.999
Access to grant	0.281	0.870	0.105	1	0.746	1.325
Educational status			6.445	5	0.265	
No formal education	1.773	1.819	0.950	1	0.330	5.889
Primary School	1.978	1.791	1.219	1	0.270	7.226
High School	-0.432	1.573	0.075	1	0.784	0.649
Some Tertiary	-0.279	1.604	0.030	1	0.862	0.756
Tertiary education	0.211	1.571	0.018	1	0.893	1.234
Household size	-0.099	0.165	0.357	1	0.550	0.906
Employment status	0.263	0.736	0.128	1	0.720	1.301
Type of Household			1.283	3	0.733	
Shack	1.178	1.053	1.252	1	0.263	3.247
RDP	20.202	8.943E4	0.000	1	0.998	5.94E8
3-Bedroom	0.421	1.026	0.168	1	0.682	1.524
Household income	0.000	0.000	1.560	1	0.212	1.000
Household head			0.079	5	1.000	
Father	-21.819	2.825E4	0.000	1	0.999	0.000
Mother	-21.678	2.825E4	0.000	1	0.999	0.000
Grandfather	-3.038	3.121E4	0.000	1	1.000	0.048
Grandmother	-22.117	2.825E4	0.000	1	0.999	0.000
Uncle	-45.644	4.002E4	0.000	1	0.999	0.000
Access to land	1.761	0.734	5.748	1	0.017**	5.816
Household financial asset	-19.693	1.477E4	0.000	1	0.999	0.000
Access to extension	0.397	0.654	0.368	1	0.544	1.487
Increase in food price	1.096	0.724	2.296	1	0.130	2.993
Constant	40.934	3.187E4	0.000	1	0.999	5.991E17
Number of observations	120					
-2 Log likelihood	74.8163					
Cox & Snell R^2	0.275					
Nagelkerke R^2	0.436					
Hosmer and Lemeshow (χ^2)	1.431 (df = 8; p-value = 0.994)					
Omnibus Tests of Model Coefficients (χ^2)	35.716 (df = 23; p-value = 0.044)					
Overall model prediction (%)	83.8%					

Significant at 10%, 5%, and 1% significance level are in bold and tagged with *, **, and ***, respectively.

4.4.3.4 Using savings to buy food

According to the results in Table 4.5, the likelihood of using savings to buy food increased with an increase in food security status, food consumption score, access to grants, household size, employment status, access to land and ownership of assets. These positive relationships were, however, not statistically significant. In contrast, most categories of educational status, living in shacks, with an uncle as heads the household, and increase in food prices showed negative, but not statistically significant, relationships with using savings to buy food. Household income was significantly related to using savings to buy food, while access to land was negatively, and significantly related to using savings to buy food.

Overall, the outcomes of the regression analysis of the relationships between using savings to buy food as a coping strategy and most socioeconomic factors, especially food security status, food consumption, access to grants, ownership of assets, and increase in food price, in this study were unexpected. The expectation was that these socioeconomic factors would have an inverse relation to using savings to buy food. For instance, when food security status and food consumption tend toward the negative, then households would have to use their savings to buy food (Compton *et al.*, 2010; Gupta *et al.*, 2015; Diallo and Toah, 2019). A possible explanation for these unexpected outcomes is probably the low household income level of most of the sampled households. Most of the households (65.8%) indicated they earned lower than R10000, thus possibly forcing them to use their savings irrespective of another socioeconomic status. Also consistent with this is the significant influence of household income on the use of savings to buy food to cope with food insecurity.

Table 4. 5. Binary logistic model of food security parameters and socioeconomic factors influencing the using savings to buy food as a coping strategy in North-West Province

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Food security status	0.407	0.744	0.299	1	0.585	1.502
Food consumption score	0.007	0.017	0.160	1	0.690	1.007
Access to grant	0.023	0.602	0.001	1	0.970	1.023
Educational status			7.139	5	0.211	
No formal education	-1.507	1.448	1.083	1	0.298	0.221
Primary School	-2.241	1.415	2.507	1	0.113	0.106
High School	-1.669	1.404	1.414	1	0.234	0.188
Some Tertiary	-0.812	1.427	0.324	1	0.569	0.444
Tertiary education	0.065	1.473	0.002	1	0.965	1.067
Household size	0.053	0.117	0.206	1	0.650	1.055
Employment status	0.254	0.558	0.207	1	0.649	1.289
Type of Household			2.295	3	0.514	
Shack	-0.264	0.784	0.114	1	0.736	0.768
RDP	0.949	0.801	1.404	1	0.236	2.584
3-Bedroom	0.622	0.721	0.744	1	0.388	1.862
Household income	0.000	0.000	5.709	1	0.017**	1.000
Household head			3.835	5	0.573	
Father	0.195	2.021	0.009	1	0.923	1.216
Mother	1.264	1.995	0.401	1	0.526	3.540
Grandfather	0.829	2.244	0.136	1	0.712	2.290
Grandmother	1.699	2.431	0.488	1	0.485	5.469
Uncle	-0.349	2.522	0.019	1	0.890	0.706
Access to land	0.908	0.572	2.516	1	0.113	2.478
Household financial asset	20.989	1.668E4	0.000	1	0.999	1.305E9
Access to extension	-1.205	0.565	4.547	1	0.033**	0.300
Increase in food price	-0.761	0.562	1.828	1	0.176	0.467
Constant	-20.666	1.668E4	0.000	1	0.999	0.000
Number of observations	120					
-2 Log likelihood	120.309					
Cox & Snell R^2	0.228					
Nagelkerke R^2	0.309					
Hosmer and Lemeshow (χ^2)	11.372 (df = 8; p -value = 0.182)					
Omnibus Tests of Model Coefficients (χ^2)	28.770 (df = 23; p -value = 0.188)					
Overall model prediction (%)	71.2%					

Significant at 10%, 5%, and 1% significance level are in bold and tagged with *, **, and ***, respectively.

4.4.3.5 *Buying food on credit*

Table 4.6 presents the outcome of the logistic modelling of the relationships between socioeconomic factors and buying food on credit, as a strategy for coping with food insecurity. Household size showed a positive and statistically significant relationship with buying food on credit. This finding suggests that as the number of household members increases the likelihood of buying food on credit also increased. In contrast, the coefficient of access to land was negative but significant thus indicating that having access to land reduced the likelihood of buying food on credit.

The negative interactions between buying food on credit and access to land and grants, and that observed with household food security status in this study are consistent with previous findings (Asefefa Kisi *et al.*, 2018; Maxwell *et al.*, 1999; Olayemi, 2012). These findings suggest that the more access to grants and land, which can be used for farming, the more food secure for the household, and the less the chances of buying food on credit.

Table 4. 6 Binary logistic model of food security parameters and socioeconomic factors influencing buying food on credit as a coping strategy in North-West Province

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Food security status	-0.355	0.924	0.148	1	0.701	0.701
Food consumption score	0.018	0.020	0.743	1	0.389	1.018
Access to grant	-1.224	0.766	2.556	1	0.110	0.294
Educational status			5.562	5	0.351	
No formal education	18.817	1.964E4	0.000	1	0.999	1.486E8
Primary School	20.318	1.964E4	0.000	1	0.999	6.671E8
High School	19.266	1.964E4	0.000	1	0.999	2.328E8
Some Tertiary	17.898	1.964E4	0.000	1	0.999	5.932E7
Tertiary education	19.807	1.964E4	0.000	1	0.999	4.0E8
Household size	0.406	0.143	8.014	1	0.005***	1.501
Employment status	-0.528	0.603	0.766	1	0.382	0.590
Type of Household			3.520	3	0.318	
Shack	1.801	0.981	3.372	1	0.066*	6.055
RDP	0.477	0.925	0.266	1	0.606	1.612
3-Bedroom	-0.057	0.853	0.004	1	0.947	0.945
Household income	0.000	0.000	0.864	1	0.353	1.000
Household head			1.097	5	0.954	
Father	19.877	2.62E4	0.000	1	0.999	4.29E8
Mother	20.544	2.62E4	0.000	1	0.999	8.361E8
Grandfather	-1.507	2.903E4	0.000	1	1.000	0.222
Grandmother	19.716	2.62E4	0.000	1	0.999	3.653E8
Uncle	1.922	3.863E4	0.000	1	1.000	6.832
Access to land	-1.639	0.640	6.555	1	0.010***	0.194
Household financial asset	18.455	1.63E4	0.000	1	0.999	1.035E8
Access to extension	0.096	0.617	0.024	1	0.876	1.101
Increase in food price	0.101	0.653	0.024	1	0.877	1.106
Constant	-59.773	3.658E4	0.000	1	0.999	0.000
Number of observations	120					
-2 Log likelihood	90.039					
Cox & Snell R^2	0.287					
Nagelkerke R^2	0.420					
Hosmer and Lemeshow (χ^2)	9.659 (df = 8; p -value = 0.290)					
Omnibus Tests of Model Coefficients (χ^2)	37.472 (df = 23; p -value = 0.029)					
Overall model prediction (%)	82.0%					

Significant at 10%, 5%, and 1% significance levels are in bold and tagged with *, **, and ***, respectively.

4.5. Chapter Summary

The socioeconomic determinants of coping strategies varied among the different coping strategies evaluated. Household engagement in agricultural production, as a coping strategy for alleviating the threats of food inadequacy or insecurity was influenced by relatively more socioeconomic factors than other coping strategies. Lack of formal education, completion of tertiary education, household income, access to land, and access to extension services significantly influenced households to use agricultural production as a coping strategy.

Access to grants and access to land were the only significant factors that influenced the consumption of wild foods and reliance on less expensive foods. Further results showed that household income and access to the extension had significant influence on the use of savings to buy food. Buying food on credit was significantly determined by household size, household types (living in shacks), and access land.

CHAPTER 5:

Summary, Conclusions and Recommendations

5.1. Summary

Firstly, the analysis shows that households relied mainly on the purchase of food as their major source. Inflation in prices of food stands as a major challenge, therefore making household income status a significant determinant of food security status. Also, shock incidences that limit agricultural production further limit the chances of coping through agricultural activities. These pose a severe threat to household food security since most rural households in South Africa fall within the low-income earning group and live below the poverty line.

Secondly, the socioeconomic determinants of coping strategies varied among the different coping strategies evaluated. Household engagement in agricultural production, as a coping strategy for alleviating the threats of food inadequacy or insecurity, is the most, and significantly, influenced by many (5) of the socioeconomic factors evaluated in the study area.

Overall, the analysis and findings from these studies showed that households in the study areas generally were unemployed and predominantly low-income earners. Also evident was the high level of income inequality among households in the study area. The major source of all the food categories assessed was through purchases, with high carbohydrate diets (maize and cereals) being the major foods groups consumed. These set a significant proportion of the households up for severe food inadequacy as food prices and inflation rates rise. Food utilisation-induced food insecurity was evident among a significant portion of households in the study area, and this was due to the low diet diversity consumed by the affected households.

5.2. Conclusions

Important among the major shock incidences or challenges associated with food security experienced by these households were increases in food prices, increases in the cost of food production, and death of livestock, among others. To address these issues, dealing with low income and poverty are viable options to tackling food security in the area. Government intervention strategies, targeted at addressing food insecurity, should be approached via multidimensional initiatives that focus more on improving household income through job creation, acquisition of basic agricultural skills and encouraging rural dwellers through rural extension, development initiatives, and provision of farm inputs to adopt food production. The impact of high food commodity prices may have resulted in the observed severely low diet diversity of affected households in the study area. Conversely, households'

coping strategies for alleviating food inadequacies were mainly associated with adjusting household eating patterns and seeking alternative sources of income for food. The most significant socioeconomic determinants of food security coping strategies at the household level in the study area were associated with: (i) human capital, mainly education status, household type, and household size; (ii) financial and economic status, mainly household income, and access to grant; (iii) access to land and extension services.

5.3. Recommendations

In line with the findings from this study, the following are the recommendations. Firstly, an intensification of government intervention and extension services through a review of existing ones and the development and implementation of new interventions. Secondly, interventions and extension services should focus more on capacity building through technical knowledge and skill acquisition, job creation, and providing resources (mainly land and farming inputs) for rural households to fully practice food production, especially for households with limited access to external sources of income. Thirdly, creating more awareness on the utilisation of foods from wild and natural sources should be another government focus, as rural communities generally have access to natural and wild resources that may help mitigate food shortages or income shocks. However, these efforts should be complimented with measures to ensure the preservation of biodiversity and avoid over-exploitation of natural food resources. Lastly, further studies should be conducted that employ primary data sourced from the same representative sample population to enable the analysis of the current situation, as these socioeconomic phenomena are quite dynamic and they morph with time, especially with the current post COVID-19 realities. Future studies should consider how government interventions on food insecurity influence household coping strategies.

References

- ABRAHAMAS, Z., BOISITS, S., SCHNEIDER, M., PRINCE, M. & LUND, C. 2021. The relationship between common mental disorders (CMDs), food insecurity and domestic violence in pregnant women during the COVID-19 lockdown in Cape Town, South Africa. *Social psychiatry and psychiatric epidemiology*, 1-10. Nature Public Health Emergency collectionPMC8288830 (doi: [10.1007/s00127-021-02140-7](https://doi.org/10.1007/s00127-021-02140-7)).
- ANDERSON, J. R. 2019. Concepts of Stability in Food Security. In: FERRANTI, P., BERRY, E. M. & ANDERSON, J. R. (eds.) *Encyclopedia of Food Security and Sustainability*. Oxford: Elsevier.
- ANSAH, I. G. K., GARDEBROEK, C. & IHLE, R. 2021. Shock interactions, coping strategy choices and household food security. *Climate and Development*, 13, 414-426.
- APUKE, O. 2017. Quantitative Research Methods : A Synopsis Approach. *Arabian Journal of Business and Management Review (Kuwait Chapter)*. 6, 40-47.
- ARIMOND, M., WIESMANN, D., BECQUEY, E., CARRIQUIRY, A., DANIELS, M. C., DEITCHLER, M., FANOU-FOGNY, N., JOSEPH, M. L., KENNEDY, G. & MARTIN-PREVEL, Y. 2010. Simple food group diversity indicators predict micronutrient adequacy of women's diets in 5 diverse, resource-poor settings. *The Journal of Nutrition*, 140, 2059S-2069S.
- ARNOLD, M., POWELL, B., SHANLEY, P. & SUNDERLAND, T. C. 2011. Forests, biodiversity and food security. *The International Forestry Review*, 13, 259-264.
- ASESEFA KISI, M., TAMIRU, D., TESHOME, M. S., TAMIRU, M. & FEYISSA, G. T. 2018. Household food insecurity and coping strategies among pensioners in Jimma Town, South West Ethiopia. *BMC Public Health*, 18, 1373.
- BAHTA, Y. T., OWUSU-SEKYERE, E. & TLALANG, B. E. 2018. Assessing participation in homestead food garden programmes, land ownership and their impact on productivity and net returns of smallholder maize producers in South Africa. *Agrekon*, 57, 49-63.
- BAIPHETHI, M. N. & JACOBS, P. T. 2009. The contribution of subsistence farming to food security in South Africa. *Agrekon*, 48, 459-482.
- BARRETT, C. B. 2010. Measuring food insecurity. *Science*, 327, 825-828.

- BERRY, E. M., DERNINI, S., BURLINGAME, B., MEYBECK, A. & CONFORTI, P. 2015. Food security and sustainability: can one exist without the other? *Public Health Nutrition*, 18, 2293-2302.
- BHATTACHERJEE, A. 2012. *Social science research: Principles, methods, and practices*, South Florida, University of South Florida.
- BRANDER, M., BERNAUER, T. & HUSS, M. 2021. Improved on-farm storage reduces seasonal food insecurity of smallholder farmer households – Evidence from a randomized control trial in Tanzania. *Food Policy*, 98, 101891.
- CHAKONA, G. & SHACKLETON, C. 2017. Minimum dietary diversity scores for women indicate micronutrient adequacy and food insecurity status in South African towns. *Nutrients*, 9, 812.
- CHAKONA, G. & SHACKLETON, C. M. 2019. Food insecurity in South Africa: To what extent can social grants and consumption of wild foods eradicate hunger? *World Development Perspectives*, 13, 87-94.
- CHETENI, P., KHAMFULA, Y. & MAH, G. 2020. Exploring food security and Household Dietary Diversity in the Eastern Cape Province, South Africa. *Sustainability*, 12, 1851.
- CHOPRA, M., DAVIAUD, E., PATTINSON, R., FONN, S. & LAWN, J. E. 2009. Saving the lives of South Africa's mothers, babies, and children: can the health system deliver? *The Lancet*, 374, 835-846.
- CHOTHIA, F. 2021. *South Africa looting: I'm struggling to find food* [Online]. BBC. Available: <https://www.bbc.com/news/world-africa-57835756> [Accessed July 21, 2021].
- COCHRANE, L. 2017. *Strengthening Food Security in Rural Ethiopia*. PhD, The University of British Columbia.
- COMPTON, J., WIGGINS, S. & KEATS, S. 2010. Impact of the global food crisis on the poor: what is the evidence. London: Overseas Development Institute.
- CORDERO-AHIMAN, O. V., SANTELLANO-ESTRADA, E. & GARRIDO, A. 2018. Food access and coping strategies adopted by households to fight hunger among indigenous communities of Sierra Tarahumara in Mexico. *Sustainability*, 10, 473.
- CRUSH, J. & CAESAR, M. 2014. City without choice: Urban food insecurity in Msunduzi, South Africa. *Urban Forum*, 25, 165-175.

- DANSO-ABBEAM, G., EHIAKPOR, D. S. & AIDOO, R. 2018. Agricultural extension and its effects on farm productivity and income: insight from Northern Ghana. *Agriculture & Food Security*, 7, 74.
- DE BEER, H., HARMSE, J. & MIELMANN, A. 2020. Why income lacks to ensure household food security: Needs and challenges identified by consumers from a rural community, South Africa. *International Journal of Consumer Studies*, 44, 521-530.
- DE COCK, N., D'HAESE, M., VINK, N., VAN ROOYEN, C. J., STAELENS, L., SCHÖNFELDT, H. C. & D'HAESE, L. 2013. Food security in rural areas of Limpopo province, South Africa. *Food Security*, 5, 269-282.
- DEVEREUX, S. & TAVENER-SMITH, L. 2019. Seasonal Food Insecurity among Farm Workers in the Northern Cape, South Africa. *Nutrients*, 11, 1535.
- DIALLO, A. & TOAH, M. 2019. Determinants of food insecurity among maize farming households in the southern region of Mali. *Journal of Food Security*, 7, 151-158.
- DODD, N. & NYABVUDZI, T. 2014. Unemployment, Living Wages and Food Security in Alice, Eastern Cape, South Africa. *Journal of Human Ecology*, 47, 117-123.
- DRIMIE, S., GERMISHUYSE, T., RADEMEYER, L. & SCHWABE, C. 2009. Agricultural production in Greater Sekhukhune: the future for food security in a poverty node of South Africa? *Agrekon*, 48, 245-275.
- DRYSDALE, R. E., BOB, U. & MOSHABELA, M. 2021. Socio-economic Determinants of Increasing Household Food Insecurity during and after a Drought in the District of iLembe, South Africa. *Ecology of Food and Nutrition*, 60, 25-43.
- DRYSDALE, R. E., MOSHABELA, M. & BOB, U. 2019. Food Security in the District of iLembe, KwaZulu-Natal: A Comparison of Coping Strategies between Urban and Rural Households. *Ecology of Food and Nutrition*, 58, 379-396.
- EARL, A. 2011. *Solving the food security crisis in South Africa: How food gardens can alleviate hunger amongst the poor*. M.Sc. Research Report, University of the Witwatersrand.
- FABER, M. & DRIMIE, S. 2016. Rising food prices and household food security. *South African Journal of Clinical Nutrition*, 29, 53-54.

- FAO. 2006. *Food Security* [Online]. Available: http://www.fao.org/fileadmin/templates/faoitally/documents/pdf/pdf_Food_Security_Cocept_Note.pdf [Accessed July 19, 2021].
- FAO. 2008. *An introduction to the basic concepts of food security* [Online]. Available: www.fao.org/docrep/013/al936e/al936e00.pdf [Accessed July 19, 2021].
- FAO. 2013. *Mainstreaming the right to food into sub-national plans and strategies* [Online]. Available: <http://www.fao.org/in-action/right-to-food-sub-national/en> [Accessed July 19, 2021].
- FARZANA, F. D., RAHMAN, A. S., SULTANA, S., RAIHAN, M. J., HAQUE, M. A., WAID, J. L., CHOUDHURY, N. & AHMED, T. 2017. Coping strategies related to food insecurity at the household level in Bangladesh. *PloS One*, 12, e0171411-e0171411.
- FRAYNE, B. & MCCORDIC, C. 2015. Planning for food secure cities: Measuring the influence of infrastructure and income on household food security in Southern African cities. *Geoforum*, 65, 1-11.
- GARCÍA-DÍEZ, J., GONÇALVES, C., GRISPOLDI, L., CENCI-GOGA, B. & SARAIVA, C. 2021. Determining Food Stability to Achieve Food Security. *Sustainability*, 13, 7222.
- GULLIFORD, M. C., MAHABIR, D. & ROCKE, B. 2003. Food insecurity, food choices, and body mass index in adults: nutrition transition in Trinidad and Tobago. *International Journal of Epidemiology*, 32, 508-516.
- GUPTA, P., SINGH, K., SETH, V., AGARWAL, S. & MATHUR, P. J. J. O. F. S. 2015. Coping strategies adopted by households to prevent food insecurity in urban slums of Delhi, India. 3, 6-10.
- HALL, C., DAWSON, T. P., MACDIARMID, J. I., MATTHEWS, R. B. & SMITH, P. 2017. The impact of population growth and climate change on food security in Africa: looking ahead to 2050. *International Journal of Agricultural Sustainability*, 15, 124-135.
- HAMAD, H. & KHASHROUM, A. 2016. Household Food Insecurity (HFIS): Definitions, measurements, socio-demographic and economic aspects. *Journal of Natural Sciences Research*, 6, 63-75.
- HEADEY, D. & ECKER, O. 2013. Rethinking the measurement of food security: from first principles to best practice. *Food Security*, 5, 327-343.

- HENDRIKS, S. 2014. Food security in South Africa: Status quo and policy imperatives. *Agrekon*, 53, 1-24.
- HENDRIKS, S. L. 2005. The challenges facing empirical estimation of household food (in)security in South Africa. *Development Southern Africa*, 22, 103-123.
- HUSSEIN, K. 2002. Food security: Rights, livelihoods and the world food summit—five years later. *Social Policy & Administration*, 36, 626-647.
- IJATUYI, E., OMOTAYO, A. & NKONKI-MANDLENI, B. 2018. Empirical analysis of food security status of agricultural households in the platinum province of South Africa. *Journal of Agribusiness & Rural Development*, 1, 29-38.
- IPC 2021. South Africa: Acute Food Insecurity Situation September - December 2020 and Projection for January - March 2021. *IPC Acute Food Insecurity Analysis Integrated Food Security Phase Classification*.
- JACOBS, P. 2010. Household food insecurity, rapid food price inflation and the economic downturn in South Africa. *Agenda: Empowering Women for Gender Equity*, 38-51.
- KEHOE, S. H., WROTTESELEY, S. V., WARE, L., PRIORESCHI, A., DRAPER, C., WARD, K., LYE, S. & NORRIS, S. A. 2021. Food insecurity, diet quality and body composition: data from the Healthy Life Trajectories Initiative (HeLTI) pilot survey in urban Soweto, South Africa. *Public Health Nutrition*, 24, 1629-1637.
- KENNEDY, G. L. 2009. *Evaluation of dietary diversity scores for assessment of micronutrient intake and food security in developing countries*. PhD Thesis, University of Wageningen.
- KIRKPATRICK, S. I., DODD, K. W., PARSONS, R., NG, C., GARRIGUET, D. & TARASUK, V. 2015. Household Food Insecurity Is a Stronger Marker of Adequacy of Nutrient Intakes among Canadian Compared to American Youth and Adults. *The Journal of Nutrition*, 145, 1596-1603.
- KUBIK, Z. & MAY, J. 2018. Weather shocks, food prices and food security: Evidence from South Africa. *56th Annual Conference of the Agricultural Economics Association of South Africa*. Cape Town, South Africa.
- LEDGER, T. 2016. *An empty plate*, Johannesburg, South Africa, Jacana Media.

- LEUTHART, K. R., PALDE, L. P. R., BABB, A. M., HEALEY, B. P. & KNUDSEN, D. C. 2021. Examining Public Transportation in Healthy Food Access Research. *Journal of Hunger & Environmental Nutrition*, 1-16.
- MAIANGWA, M., OMOLEHIN, R., ADENIJI, O. & MOHAMMED, U. 2010. Food insecurity: challenges of agricultural extension in developing countries. *Journal of Agricultural Extension*, 14, 73-105.
- MAINA, J. W. 2018. Analysis of the factors that determine food acceptability. *The Pharma Innovation*, 7, 253-257.
- MASIPA, T. S. 2017. The impact of climate change on food security in South Africa: Current realities and challenges ahead. *Jamba (Potchefstroom, South Africa)*, 9, 411-411.
- MAXWELL, D., AHIKDEKE, C., LEVIN, C., ARMAR-KLEMESU, M., ZAKARIAH, S. & LAMPTEY, G. M. 1999. Alternative food-security indicators: revisiting the frequency and severity of 'coping strategies'. *Food Policy*, 24, 411-429.
- MAXWELL, D., CALDWELL, R. & LANGWORTHY, M. 2008. Measuring food insecurity: Can an indicator based on localized coping behaviors be used to compare across contexts? *Food Policy*, 33, 533-540.
- MAXWELL, D. G. 1995. Alternative food security strategy: A household analysis of urban agriculture in Kampala. *World Development*, 23, 1669-1681.
- MCDERMOT, D., IGOE, B. & STAHERE, M. 2017. Assessment of Healthy Food Availability in Washington State—Questioning the Food Desert Paradigm. *Journal of Nutrition Education and Behavior*, 49, 130-136.e1.
- MKHAWANI, K., MOTADI, S. A., MABAPA, N. S., MBHENYANE, X. G. & BLAAUW, R. 2016. Effects of rising food prices on household food security on female-headed households in Runnymede Village, Mopani District, South Africa. *South African Journal of Clinical Nutrition*, 29, 69-74.
- MKHWANAZI, M. K. 2016. *Perception study of a GDARD Homestead Food Garden programme in response to food insecurity in Gauteng*. PhD Dissertation, University of the Witwatersrand.
- MOCKSHELL, J. & VILLARINO, M. E. J. 2019. Agroecological Intensification: Potential and Limitations to Achieving Food Security and Sustainability. In: FERRANTI, P., BERRY, E.

- M. & ANDERSON, J. R. (eds.) *Encyclopedia of Food Security and Sustainability*. Oxford: Elsevier.
- MTHETHWA, S. & WALE, E. 2021. Household Vulnerability to Food Insecurity in Rural South Africa: Evidence from a Nationally Representative Survey Data. *International Journal of Environmental Research and Public Health*, 18, 1917.
- MURAOKA, R., JIN, S. & JAYNE, T. S. 2018. Land access, land rental and food security: Evidence from Kenya. *Land Use Policy*, 70, 611-622.
- NASSAJI, H. 2015. Qualitative and descriptive research: Data type versus data analysis. 19, 129-132.
- NCUBE, K., SHACKLETON, C. M., SWALLOW, B. M. & DASSANAYAKE, W. 2016. Impacts of HIV/AIDS on food consumption and wild food use in rural South Africa. *Food Security*, 8, 1135-1151.
- NGIDI, M. S. & HENDRIKS, S. L. 2014. Coping with food insecurity in rural South Africa: The case of Jozini, KwaZulu-Natal. *Mediterranean Journal of Social Sciences*, 5, 278-289.
- NGOMI, C., FADIKPE, A., NGABA, M., CHEN, Q., NFONBEU, M. & YANG, J. Impact of adoption of agricultural extension services on farm households food security in Cameroon. IOP Conference Series: Earth and Environmental Science, 2020. IOP Publishing, 012001.
- ODURO-OFORI, E., ABOAGYE, A. P. & ACQUAYE, N. A. E. 2014. Effects of education on the agricultural productivity of farmers in the Offinso Municipality. *International Journal of Development Research*, 4, 1951-1960.
- OECD 2001. The DAC guidelines: Poverty reduction. Organisation for Economic Co-operation and Development.
- OGOT, N. 2021. Metrics for identifying food security status. In: GALANAKIS, C. M. (ed.) *Food Security and Nutrition*. Oxford, United Kingdom: Academic Press.
- OGUTTU, J. W., DWEBE, T. & NCAYIYANA, J. 2021. Factors correlated with home gardening in Gauteng Province, South Africa. *International Journal of Environmental Research and Public Health*, 18, 2737.
- OLAYEMI, A. O. 2012. Effects of family size on household food security in Osun State, Nigeria. *Asian Journal of Agriculture and Rural Development*, 2, 136-141.

- OMOTAYO, A., IJATUYI, E., OLORUNFEMI, O. & AGBOOLA, T. 2018. Food security situation among South African urban agricultural households: Evidence from Limpopo Province. *Acta Academica*, 14, 60-74.
- OWINO, F. O. 2019. Socio-cultural Determinants of Food Security and Consumption Patterns in Kisumu, Kenya. *Food and Public Health*, 9, 119-124.
- PEREIRA, L. M., CUNEO, C. N. & TWINE, W. C. 2014. Food and cash: understanding the role of the retail sector in rural food security in South Africa. *Food Security*, 6, 339-357.
- PLAGERSON, S. 2021. *South African policies go some way to tackling poverty and inequality. But more is needed* [Online]. The Conversation Africa. Available: <https://theconversation.com/south-african-policies-go-some-way-to-tackling-poverty-and-inequality-but-more-is-needed-151696> [Accessed July 21, 2021].
- PORTER, A. & KWASI, S. 2017. *Is Southern Africa facing a food security disaster?* [Online]. Institute for Security Studies. Available: <https://issafrica.org/iss-today/is-southern-africa-facing-a-food-security-disaster> [Accessed July 21, 2021].
- PROSEKOV, A. Y. & IVANOVA, S. A. 2018. Food security: The challenge of the present. *Geoforum*, 91, 73-77.
- RYCKMAN, T., BEAL, T., NORDHAGEN, S., CHIMANYA, K. & MATJI, J. 2021. Affordability of nutritious foods for complementary feeding in Eastern and Southern Africa. *Nutrition Reviews*, 79, 35-51.
- SABI, S. C. 2018. *Development of a framework for managing food security programme: An analysis of student food insecurity and the interventions at the University of KwaZulu-Natal, South Africa*. PhD Thesis, University of KwaZulu-Natal.
- SAGE, C. 2014. Impacts of Climate Change on Food Accessibility. In: FREEDMAN, B. (ed.) *Global Environmental Change*. Dordrecht: Springer Netherlands.
- SHACKLETON, C. & SHACKLETON, S. 2004. The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa. *South African Journal of Science*, 100, 658-664.
- SIKUKA, W. 2021. Rising food price inflation in South Africa causes concern for consumers. United States Department of Agriculture.

- SKINNER, E. A. & ZIMMER-GEMBECK, M. 2016. Coping. *In: FRIEDMAN, H. S. (ed.) Encyclopedia of Mental Health (Second Edition)*. Oxford: Academic Press.
- SPILL, M. K., JOHNS, K., CALLAHAN, E. H., SHAPIRO, M. J., WONG, Y. P., BENJAMIN-NEELON, S. E., BIRCH, L., BLACK, M. M., COOK, J. T., FAITH, M. S., MENNELLA, J. A. & CASAVALE, K. O. 2019. Repeated exposure to food and food acceptability in infants and toddlers: a systematic review. *The American Journal of Clinical Nutrition*, 109, 978S-989S.
- STATS SA 2018. Provincial profile: North West Pretoria: Statistics South Africa.
- STATS SA 2019a. Inequality Trends in South Africa: A multidimensional diagnostic of inequality Pretoria: Statistics South Africa.
- STATS SA 2019b. Mid-year population estimates. *Statistical Release*. Pretoria: Statistics South Africa.
- STATS SA 2019c. Towards measuring food security in South Africa: An examination of hunger and food inadequacy. Pretoria: Statistics South Africa.
- STATS SA 2021. Quarterly labour force survey: Quarter 1, 2021. *Statistical Release*. Pretoria: Statistics South Africa.
- SWAMINATHAN, M. S. & BHAVANI, R. V. 2013. Food production & availability - essential prerequisites for sustainable food security. *The Indian Journal of Medical Research*, 138, 383-391.
- TARUVINGA, A., MUCHENJE, V. & MUSHUNJE, A. 2013. Determinants of rural household dietary diversity: The case of Amatole and Nyandeni districts, South Africa. *International Journal of Development and Sustainability*, 2, 2233-2247.
- UNITED NATIONS. Report of the World Food Conference: Rome, 5-16 November 1974. Publication E/Conf/65/20. New York: UN, 1975.
- VASUTHEVAN, S. & MTHEMBU, S. 2016. *De Haan's Health of South Africa*, Cape Town, Juta.
- VERSCHUUR, J., LI, S., WOLSKI, P. & OTTO, F. E. 2021. Climate change as a driver of food insecurity in the 2007 Lesotho-South Africa drought. *Scientific reports*, 11, 1-9.

- VILAR-COMPTE, M., GAITÁN-ROSSI, P., FLORES, D., PÉREZ-CIRERA, V. & TERUEL, G. 2020. How do context variables affect food insecurity in Mexico? Implications for policy and governance. *Public Health Nutrition*, 23, 2445-2452.
- WALSH, C. M. & VAN ROOYEN, F. C. 2015. Household food security and hunger in rural and urban communities in the Free State Province, South Africa. *Ecology of Food and Nutrition*, 54, 118-137.
- WHELAN, J., MILLAR, L., BELL, C., RUSSELL, C., GRAINGER, F., ALLENDER, S. & LOVE, P. 2018. You can't find healthy food in the bush: Poor accessibility, availability and adequacy of food in rural Australia. *International Journal of Environmental Research and Public Health*, 15, 2316.