# The contribution of emerging farmers towards food security in Makhado local municipality, Limpopo province

**by**

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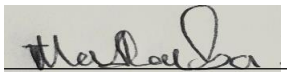
# Declaration

I declare that this proposal titled ‘The contribution of emerging farmers towards food security in Makhado Local Municipality, Limpopo Province’ is my own original work. I have acknowledged and referenced all sources that I have used and quoted. I hereby submit it in partial fulfilment of the requirements of the degree of Master of Agricultural economics in the University of the South Africa, Pretoria. I have not submitted this report before for any other degree or examination to any other institution.



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# Abstract

Food security has become one of the most important items on today's international political agenda and a serious issue for governments around the world. The aim of this study was to assess the contribution of emerging farmers towards food security within Makhado Local Municipality, Limpopo Province mainly through the quantitative research design. To achieve this, a structured questionnaire which had three sections (socio-economic characteristics of respondent, farm characteristics, and challenges encountered by respondent) was used to collect data from 182 emerging farmers within MLM. Both descriptive and inferential statistics were employed to analyse the collected data. Variables that were used to determine the socio-economic characteristics of the respondents included age, gender, marital status, household size, education level, and employment status of an emerging farmer together with their access to irrigation water. In general, the descriptive statistics results have shown that only 20.4% of emerging farmers were food secure. The study also established that emerging farmers within MLM are educated at different levels, while the sector is male dominated, with few young people, and most of the farmers without access to irrigation water. Inferential statistics have illustrated that variables such as gender (females), age (young and middle adults) had a negative but significant impact on the net income (as proxy for food security) generated by emerging farmers from the various farming practices. On the other hand; age, household size and access to irrigation water have shown a positive and significant impact on the food security status of the emerging farmers. Based on the findings of the study; it is recommended that strategies that will encourage young people to participate more in agriculture as a way of food production and income generation be introduced. To address the issue lack of markets among emerging farmer; both big and small markets need to communicate their product expectations with the emerging farmers. Besides focusing solely on farming, emerging farmers can also venture into other means of generating income in order to enhance food security.



**Key words:** Food security, food poverty line, socio-economic characteristics, net income, descriptive statistics, binary regression model.

# Table of Contents

## List of tables and figures

### Tables



### Figures

**List of abbreviations and acronyms**

| | |
|---|---|
| BRM | Business Research Methodology |
| DAFF | Department of Agriculture, Forestry, and Fisheries |
| FAO | Food and Agriculture Organisation |
| HFG | Health Finance and Governance |
| ICGSCR | International Covenant on Economic, Social and Cultural Rights |
| IFSNP | Integrated Food Security and Nutrition Programme |
| IFSS | Integrated Food Security Strategy |
| MLM | Makhado Local Municipality |
| NDP | National Development Policy |
| SA | South Africa |
| SADC | Southern African Development Community |
| SAHRC | South African Human Rights Commission |
| STATS SA | Statistics South Africa |
| USAID | United States Agency for International Development |

# Chapter 1: Introduction

## 1.1 Introduction

In 2002, the South African cabinet approved the national Integrated Food Security Strategy (IFSS) in order to streamline, harmonise, and integrate the diverse food security programmes (Department of Agriculture, Forestry, and Fisheries, 2013). The IFSS policy was seconded to mainly promote the availability, accessibility, and affordability of safe and nutritious food both on national and household levels (DAFF, 2013). According to the Bill of Rights, every South African citizen has the right to have access to sufficient food and water (The Bill of Rights, 1996). It is further highlighted in the Bill of Rights that the state must take reasonable legislative and other measures within its available resources to ensure the progressive realisation of these rights (The Bill of Rights, 1996).

As a guideline set to achieve food and nutrition security, the National Development Plan (NDP) lays out a number of methods and targets which are aimed at alleviating poverty, reducing unemployment, and eliminating inequality by the year 2030 (DAFF, 2013). This follows the reaffirmation of the NDP by the then honourable president Jacob Zuma in his 2013 State of the Nation address (SONA) (DAFF, 2013). Consequent to this reaffirmation, the NDP has pointed out a number of steps that include expanding the use of irrigation systems, securing land tenure, and the promotion of nutrition education as a means to improve food security (DAFF, 2013). In his SONA, President Matamela Ramaphosa made a call for government to intensify support given to emerging farmers so that they can also participate in the formal economy (Capricorn district, 2019).

In order for food security to be achieved, the National Food and Nutrition Security Policy provides a platform for strategies such as, increased and better targeted public spending on social programmes, efforts to increase food production and distribution which include access to production inputs for emerging agricultural sector, leveraging food procurement to support community-based food production initiatives, and trade measures that will promote food security (DAFF, 2013). This policy further asserts that, the alignment of investment in agriculture towards local economic development,

particularly in the rural areas will include the subsidisation of inputs and support services for increased production, and to also ensure a more effective food storage and distribution networks (DAFF, 2013).

While for many decades South African agricultural sector has suffered neglect, suppression, and discrimination against black farmers, the country is in the process of transformation and decolonisation of the sector (DAFF, 2011). This came after the democratically elected government in 1994, through which transformation policies were developed in order to remedy the injustices of the apartheid era (DAFF, 2011). Transformation policies include, the land reform policy which identifies emerging farmers as potential beneficiaries. During the apartheid era, the Native land act became a law in 19 June 1913 and besides limiting African land ownership to 7 percent, it further restricted black people from buying or occupying land (South African Government, 2021).

Food rights are recognised on both national and international levels. The Universal Declaration of Human Rights (UDHR) and the International Covenant of Economic, Social and Cultural Rights (ICESCR) recognise the right to food as a component of an adequate standard of living (SAHRC, 2003). The ICESCR mandates that state parties undertake individually and through international co-operation that will improve access to food. In achieving food security, human security is also achieved. Human security is the right of all people to live in freedom and dignity, free from poverty and despair, that all individuals, in particular vulnerable people, are entitled to freedom from fear and freedom from want, with an equal opportunity to enjoy all their rights and fully develop their human potential (McGuire, 2015).

In the research results released by Stats SA in 2017, it was established that over 550 000 households in South Africa's former homelands had stopped farming between 2011 and 2016. This number is expected to have increased and is concerning when taking into account the high levels of food insecurity and hunger in the country (Stats SA 2021). In the same study, it was reported that one in five people in South Africa are vulnerable to hunger (Stats SA, 2021). This decline in agricultural participation leaves rural and poor households with no choice but to rely on food purchase. While rural households have access to land, in his studies Mathebula et al. (2017) established that, their problem lies in the lack of motivation to practice farming due to

limited access to inputs and poor infrastructure. When there is no local food production, the demand for food increases, food prices continue to increase, consequently, individuals who earn a low income are left at a disadvantage as it becomes difficult if not impossible for them to access food (CEFS, 2021).

According to the United States Agency for International Development (USAID) (2020), 800 million people worldwide go to bed hungry, this number is however, expected to have reached 9 billion by 2050. In order to curb this number, the world will have to double its current food production (USAID, 2020). As a method of assisting in doubling the current food production, the government as well as members of communities need to invest in farming (USAID, 2020).

South Africa is said to be a country that is secured at a national level in terms of food. However, as the world continues to face widespread food insecurity, providing food for all has become a challenge for South Africa. The country like other African developing nations, has shown a high rate of income inequality and extreme levels of poverty (Stats SA, 2017). Statistics indicated that, 56% of the South African population lived in poverty with a staggering 28% of this number living in extreme poverty and below the food poverty line (Stats SA, 2017).

As previously indicated, human security and food security co-exists. The relationship between human security and food security is predicted on the idea of the full realisation of the human right to adequate food as a fundamental human right and is inclusive of all people (McGuire, 2015). This right is realised when every person, young and old, have physical and economic access at all times to adequate food or means for its procurement (McGuire, 2015). Human security aims at ensuring the survival, livelihood, and dignity of people in response to current and emerging threats that are widespread and cross cutting such as HIV and AIDS (McGuire, 2015).

The 5th of March 2020 marked the beginning of the history that will forever be recalled in South Africa. This is after the National Institute for Communicable Diseases (NICD) through the minister of health Dr Zweli Mkhize confirmed the first positive Corona virus case in the country (NICD, 2020). Nearly all industries experienced a massive drop in output in the second quarter of 2020 (Stats SA, 2021). Covid-19 impacts have led to severe and widespread increase in global food insecurity which has affected the vulnerable households in all the countries. The primary risks to food security are said

to be at the country level which are indicated by high retail prices and reduced incomes, which ultimately result in households cutting down on their quantity and quality of their food consumption (Stats SA, 2021).

Rising food prices have and continue to negatively affect people between the low and middle income countries as they spend a larger share of their income on food than people in high-income countries (UNICEF, 2020). Some food producers lose perishable and nutritious food as consumption patterns shift towards cheaper staple food (UNICEF, 2020). The current food insecurity is not the result of food shortage but, mainly the result of supply disruption and inflation affecting key agricultural inputs such as fertilizers and seeds, or prolonged labour shortages which have the possibility to diminish next season's crop ultimately leading to farmers eating the seeds (UNICEF, 2020).

## 1.2 Problem statement

Africa's challenges are complex and intricate, says Pasara and Diko (2020). One of the biggest challenges facing humanity in the 21st century is food insecurity. The African continent is characterised by, perennial poverty challenges and also struggles to sustain its food production due to drought and other climatic challenges (Waha et al.,2018). While that is the case, population growth in Sub-Saharan Africa continues to push crop production into marginal areas with little and unreliable rainfall. This ultimately affects the well-being of many communities including the Southern African Development Community (SADC) countries which rely on agricultural production for their livelihoods (Mazhinji and Ntuli, 2021). Based on the SADC vulnerability assessment report and analysis report presented by Mazhinji and Ntuli (2021), approximately 41 million people are food insecure which raises an urgent need to increase production of nutritious food in order to overcome hunger.

While South Africa is said to be secured with regards to food, it is vital to ensure that the poor and disadvantaged people in rural communities also have access to food. With many different factors contributing towards food insecurity, it is the government's role to create an enabling environment for all citizens. For various reasons, the poor are unable to buy sufficient nutritious food which is necessary to promote an active life style.

A number of studies have been conducted on commercialisation of emerging farmers with the intention to broaden the understanding of challenges hindering the progress to migrate emerging farmers to commercial farming (DAFF, 2011). Despite the knowledge gathered from different studies conducted, there is still a remarkable scarcity of scientific information to describe challenges affecting emerging farmers and their contribution towards food security especially in the Makhado Local Municipality. This as a result, becomes a hindrance for emerging farmers in the area to fulfil all that they are meant to achieve ranging from increasing food security to creating employment.

Studies have shown that the agricultural output of small-scale farmers in the country is generally low due to several limitations that they face ranging from; reduced access to finance, lack of access to market, poor infrastructure, low level of education, lack of production inputs such as seeds and fertiliser, climate change, droughts, to soil erosion (Mokgomo et al., 2022). Mugambiwa and Tirivangasi (2017) specifically reported that; there are numerous potential effects climate change could have on agriculture as it affects crop growth and quality and livestock health. Further to that; they maintained that farming practices can be affected as well as animals that require specific climatic condition to thrive. All of these factors impede the progress that emerging farmers could make towards improving their food security, leaving them vulnerable to food insecurity. This ultimately results in increased levels of poverty among emerging farmers and their households.

In the final analysis, this study focused on the contribution that emerging farmers can have on enhancing their net income (income as proxy food security) and the opportunities they present in ameliorating the economic well-being of the communities in which they operate or farm.

## 1.3 Research objectives

The main objective of the study was to assess the contribution of emerging farmers towards food security in Makhado Local Municipality. Other objectives were:

- To determine the impact of socio-economic characteristics on value of income (as proxy for food security) generated by emerging farmers in Makhado Local Municipality.

- To determine the net income (as proxy for food security) generated by emerging farmers from various farming practices in Makhado Local Municipality.
- To identify challenges faced by emerging farmers in Makhado Local municipality

## 1.4 Research questions

The general topic of this study is: The contribution of emerging farmers towards food security within Makhado local Municipality in Limpopo Province. This study sought to answer the following research questions:

- How do socio-economic characteristics of emerging farmers within MLM affect the net income (as proxy for food security) they generate from different farming practices?
- What is the level of household net income generated by emerging farmers within Makhado Local Municipality from their various farming practices?
- What are the challenges that emerging farmers are faced with in Makhado Local Municipality?

## 1.5 Significance of the study

When there is a scientific document indicating the impact of emerging farmers on food security, it assists Makhado Local Municipality to measure the effectiveness of this strategy as a way to enhance food security and eradicate poverty. In this way, policy makers have a clear direction and evidence they need in order to draft policies that will assist and promote emerging farmers in the future. A clearly defined challenge by emerging farmer, gives direction on the relevant intervention that will be necessary for different farming practices in order to maximise food production and enhance food security.

## 1.6 Definitions

### 1.6.1 Emerging farmers

According to the National Department of Agriculture (NDA) (2006), emerging farmers are farmers who have or continue to benefit from one of the government's land reform programmes such as land redistribution for Agricultural Development (LRAD) and Comprehensive Agricultural Support Programme (CASP). NDA further defined emerging farmers as those who are dependent on the state and semi-state organisations for support and finance and those who consume and sell some portion of their harvest (NDA, 2006). This definition also includes those farmers whose farms are 2 hectares big or more.

### 1.6.2 Small-scale farmers

These are farmers who produce crops and livestock on a small piece of land without the use of advance and expensive technology (NGO Pulse, 2016). This type of farming is mainly characterised by, intensive labour and the products play a dual role of being the source of household food security and also as source of income from sold surplus (NGO Pulse, 2016).

### 1.6.3 Subsistence farming

It is defined as the practice of growing crops and raising livestock sufficient only for one's own use, without significant surplus for trade (Oxford, 2021). Rankoana (2017) defined subsistence farming as, the type of farming in which the farmer grows food for him/herself and their families on a small plot of land and it is mainly intended for survival with little or no emphasis on trading and selling of the produced products.

### 1.6.4 Commercial farming

It is the type of farming that is all about the growing of crops or rearing of animals for raw materials, food, or export, with the aim to attain profit (Conserve energy future, 2021). Crops and livestock in commercial farming are produced on a large scale, and

grown in big farms, using machinery, irrigation methods, chemical fertilisers, and other agricultural technologies (Conserve energy future, 2021).

### 1.6.5 Food security

The concept of food security was first defined at the World Food Conference in 1974 (M'kaibi et al., 2017). At the time of the conference, food security was defined both at national and economic levels. According to FAO (2009), food security was defined as a concept that exists when all people at all times have physical, social, and economic access to sufficient safe and food preferences for an active and healthy life (FAO, 2009). The definition further established that, food security is made up of four pillars, namely: food availability, food accessibility, food utilization, and food stability. Food availability refers to the household's ability to get food in the marketplace or from other sources such as transfers or gifts (Vermeulen et al., 2019). Food accessibility on the other hand talks to access by individuals to adequate resources for acquiring appropriate foods for a nutritious diet (FAO, 2016). Food utilisation is the utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met (FAO,2016).

To add on that, food security is also defined as the ability of people to secure adequate food (NDA, 2006). In 1996, food security was defined by FAO (1997), as a phenomenon that exists when all people, at all times, have physical and economic access to sufficient, safe, nutritious food to meet their dietary and food preferences for an active life.

The following labels define ranges of food security:

- High food security: no reported indications off food access problem or limitations.
- Marginal food security: one or two reported indications which may include anxiety over food sufficiency or shortage of food in the house. This extends to little or no indication of changes in diets or food intake (Vermeulen et al., 2019).

### 1.6.6 Food insecurity

According to UNICEF (2020), food insecurity manifests itself when a person or people do not have regular access to enough safe and nutritious food to promote normal growth and develop an active and healthy life.

### 1.6.7 Food poverty line

Refers to the amount that individuals need to afford the minimum required daily energy intake and it is R 624 per person per month as published by Statistics South Africa (Stats SA, 2021).

## 1.7 Limitations and delimitations of the study

During the data collection process; both literate and illiterate farmers were involved. Illiterate emerging farmers found it difficult to complete the questionnaire. Be that as it was; agriculture extension farmers and other literate farmers were willing to assist those who could not complete the forms themselves. The cooperation between the literate and illiterate respondents made the data collection phase achievable.

Other respondents saw the meeting with the researcher as an opportunity to vent out their concerns. While that was positive for the research; others seemed worried that, their concerns may remain unaddressed as they have previously had meetings with other people but did not deliver on what they promised. The researcher then clearly informed the respondents that her main objective was to conduct the research on their concern and farm activities and report to the relevant department who will be in a better position to address their issues.

## 1.8 Conceptual frame work

Based on the literature review pertaining this study, the variables below were identified as major factors contributing to emerging farmers' food security state. Figure 1 below indicates which independent variables had an impact of emerging farmers' food security (dependent variable) and the income (dependent variable) they generated as a proxy for food security.

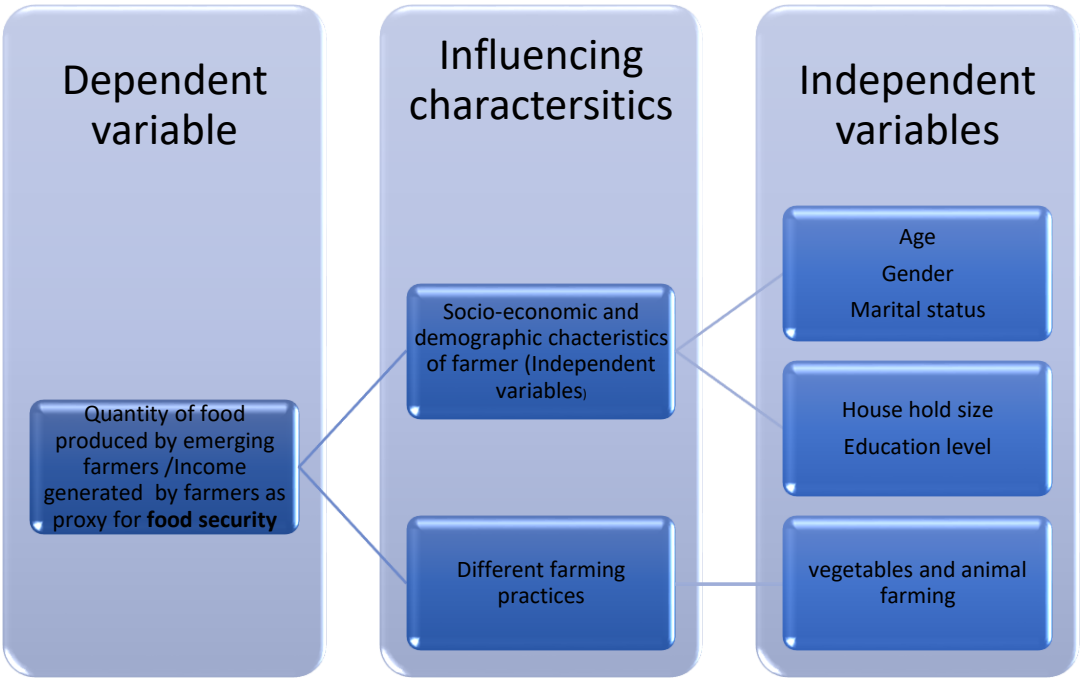


Figure 1: Conceptual framework

# Chapter 2: Literature review

## 2.1 Introduction

This chapter reviews literature from different sources in line with the study objectives. It especially reviews the socio-economic characteristics of emerging farmers both from African and South African perspective, it goes further to look at the generation of income by emerging farmers who are involved in different farming practices. Finally, it focuses on the challenges faced by emerging farmers. All these studies were conducted to see what kind of relationship exists between emerging farmers and food security.

## 2.2 Socio-economic characteristics of emerging farmers

### 2.2.1 General perspectives

Food security emerged as a global crisis in the recent years, particularly following the 2008 economic meltdown (Myeni et al., 2019). Africa is the only continent in which the absolute number of undernourished people has increased over the past thirty years (Sibhatu and Qaim, 2017). Food insecurity remains an essentially rural phenomenon as most of the rural dwellers do not produce enough to feed their families due to lack of adequate access to means of production and the fact that communities are poorer and often struggle to buy nutritious foods (Kamara et al., 2019). Food insecurity is about poverty and inequality and therefore achieving agricultural development is necessary in order to ensure the reduction of such a phenomenon (Impiglia and Lewis, 2019).

Economic access to food has become a decisive factor in food insecurity as the poorest communities both in the rural and urban areas continue to spend most of their money on food items irrespective of the country's economic and agricultural development level (Maziya et al., 2017). While household food security is often threatened by isolated events such as loss of income, climate changes, political, and economic factors, these factors can also negatively affect food security level for the entire region (Myeni et al., 2019).

Many of the world's food insecure and undernourished people are smallholder farmers in developing countries like South Africa (Sibhatu and Qaim, 2017). Apart from its

potential to contribute towards eradicating poverty and hunger, agriculture in Africa represents a major economic activity and contributes an average of 15% of Gross Domestic Product (GDP), employs 65% of the workforce, and constitutes the primary income generating activity for many (Kamara et al., 2019). Country specific socio-economic issues are discussed below.

### 2.2.2 Socio-economic characteristics of emerging farmers in Africa

In Africa, food in-security is associated with a number of factors ranging from size of the family, age of household head, educational level, gender, size of cultivated land, irrigation access, number of extension visits, use of fertilizers and improved seed, and ownership of livestock (Zhou et al., 2019). According to Olounlade et al. (2020), households headed by male farmers are more food secure than those headed by female farmers as females are more concerned about food preparation, processing, and preservation. The major challenge facing female farmers is the lack of access to advanced production techniques such as high-quality seeds, fertilizers, credit access, pesticides, and marketing services due to gender-biased traditions (Zhou et al., 2019).

Understanding the socio-economic characteristics of small holder farmers is imperative as it provides the basis for addressing a number of challenges that the farmers are faced with. Majority of smallholder farmers occupy less than 2 hectares of land and are found in Africa (Kamara et al., 2019). Most of these farms are located in the rural areas and are operated by smallholder farmers who depend on agriculture for economic livelihood. However, these farmers are constrained by lack of capital assets that are necessary in order to increase agricultural productivity, food security, and income (Sibhatu and Qaim, 2017).

Smallholder farmers in Africa are still characterised by low input and low output which negatively affect the farmers' profitability and competitiveness (Kamara et al., 2019). Due to lack of skills and resources to engage in commercial agriculture, over 80% of smallholder farmers in Africa still produce at subsistence level (Sibhatu and Qaim, 2017). Currently, Africa's biggest challenge is how to feed its ever increasing population. Approximately 90% of the rural population in Africa depend on agriculture for their livelihoods and food security (Kamara et al., 2019). While that stands, majority of this 90% does not have the power to resolve the problem of food insecurity as a

result of low productivity and aggressive agro-ecological factors, says Kamara et al. (2019).

#### 2.2.2.1 Nigeria case study

In Nigeria, small scale farmers who dominate the agricultural landscape and food production of the nation have and continue to encounter socio-economic and institutional constraints that hamper their productivity (Onogwu and Igbodor, 2017). In the study conducted by Ogunniyi et al. (2020) in Nigeria, the following results were reported: It was established that food insecurity incidents increase with age. The study further indicated that households headed by people aged below 25 years and the elderly (i.e above 65 years) experience no food insecurity which can be attributed to the fact that those who are below 25 years old are more economically active and able to engage in profitable livelihood activities whereas those who are 65 years and above are most likely to be enjoying remittances from their migrant children and family members (Ogunniyi et al., 2020).

With respect to household size, it was established that food insecurity is directly proportional to the number of household members. The latter means that with increasing household members, the level of food insecurity also increases and decrease with decreasing household members. Household becomes less vulnerable to food insecurity with increased educational attainment by the household head. The same study also indicated that smallholder farmers belonging to any association have some form of social capital that may help them to increase their income by boosting their bargaining power for higher product pricing and lower input cost. To add on that, the study highlighted the fact that the farmer's access to credit increase their probability of being food secure (Ogunniyi et al., 2020).

#### 2.2.2.2 Lesotho case study

This study focused on the socio-economic characteristics of farmers and the impact they have on food security in the farmers' households. Below is the analysis from the study results conducted by Muroyiwa and Ts'elisand (2021) in Lesotho on the topic of factors affecting food security of rural farmers in Lesotho:

**Age:** farmers' age was found to be an important factor in the determination of food security. Households headed by older farmers were more food secure compared to

households headed by young farmers. This was attributed to the fact that young people participate in other economic activities besides on-farm activities whereas old people are often retired with nothing much to do but to just tend their farms.

**Marital status:** the study found that, households headed by married individuals have a high chance of becoming food secure. In Lesotho, majority of married women are involved in faming because African tradition allows for them to be empowered and access to resources through their husbands.

**Household size:** this study found that, increasing household size threatens food security, the larger the size of the family, the more the demand and strain it puts on the household's food security.

**Gender:** According to the study results, gender of the farmer was found to have no impact on food security as both male and female have the ability to generate income and enhance food security.

**Education:** the study established that, educational level has no influence on the contribution of farmers to food security because the assumption is that people with higher levels of education are more likely to get higher paying jobs and be more food secure. While most of the farmers in Lesotho do not have any formal educational qualifications, they are able to produce vegetables for their family consumption and generate income by selling the surplus.

**Employment status:** As previously indicated, most of the farmers in Lesotho do not have any form of formal qualification that could grant them an opportunity to be employed. As a result, farming is their main source of livelihood. Unemployed farmers spend most of their quality time tending their farms and as a result they are able to deal with arising issues without any delay.

**Farming experience:** Households headed by older people are more likely to be food-secure than those headed by younger people. Older and more experienced farmers tend to have more food in their households. The assumption though is that, the element of farming experience and knowledge gained with age enables the farmer to spread the risks of food insecurities through strategies such as diversified production.

### 2.2.3 Socio-economic characteristics of emerging farmers in South Africa

Majority of emerging farmers in South Africa are involved in subsistence farming due to poor resource endowment. In South Africa, it is estimated that 35% of the population is vulnerable to food insecurity (Alfred, 2018). In the same study, Maziya et al. (2017) established that the incidents of food insecurity in South Africa increases with an increase in household size, decrease in income, female-headed households, and living in rural areas. Approximately four million people in South Africa were engaged in smallholder agriculture, of whom the majority live in communal areas (Stats SA, 2018).

It is generally believed that, improving agricultural productivity is a key strategy for rural poverty alleviation which also addresses the issue of food insecurity (Stats SA, 2018). Increasing agriculture production gives farming households an opportunity to increase the amount of food they attain for home consumption and the market, ultimately increasing the household income which can be used to improve general household livelihoods (Awotide et al., 2019).

Although the unemployment rate in South Africa is high, youth (≤35 yrs) seems to have less interest in farming (Zantsi et al., 2021). According to Statistics South Africa (2018), majority of people involved in farming are between the age of 50 and 66. While this is factual, it raises concern about the future of agriculture in South Africa considering the fact that young people are the ones who have a high chance of succeeding in agriculture because they are more likely to adopt new farming technologies (Myeni et al., 2019). Older farmers are less likely to adopt the new sustainable farming practices and often rely on their indigenous knowledge to manage their farms and as a result productivity is negatively affected which ultimately have a negative impact on both income and food security, says Maziya et al. (2017).

While majority of young people relocate from rural to urban areas in search of employment, most of the elderly people move from urban to rural areas where they spend most of their retirement time doing other activities including farming (Zantsi et al., 2021). Majority of the elderly people have limited education and low literacy levels which negatively impact on farm production as new technological advancement and information require a certain level of formal education and training (Olofsson, 2020). Farmers with higher levels of formal education are likely to adopt new sustainable

agricultural management practices ultimately enhancing food security and improving income while their counterparts on the other hand become more vulnerable and exposed to food insecurity (Maziya et al., 2017). The low level of education among smallholder farmers has remained a major constraint to the adoption of modern farming techniques which has limited the potential to increase agricultural productivity (Sumane et al., 2018). With sound educational background, farmers would be in a better position to improve managerial ability and acquire better information to improve marketing (Maziya et al., 2017).

Land ownership and size of land allocated to smallholder farmers has and continues to hinder increased productivity. According to Myeni et al. (2019), most South African smallholder farmers own less than 2 hectares of land. The smallholder farming community which is dominated by resource-poor black famers own approximately 13 % of the total agricultural land whereas the well-developed commercial farming community which is dominated by white farmers own the remaining 87 % of the total agricultural land (Stats SA, 2018). This difference in ownership is attributed to the past laws and injustices associated with the apartheid era. The concerning matter is the fact that even after 25 years into democracy, South African smallholder farmers are still landless and continue to sink into poverty and food insecurity (Myeni et al., 2019). While land ownership by black smallholder farmers is limited, majority of those who have farming land lack farming equipment such as tractors, rippers, and planters as a result of financial constraints which lead to delayed planting and reduced production rate (Awotide et al., 2019).

## 2.3 Income generation by farmers from various farming activities

### 2.3.1 Global perspective

Globally, the issue of infrastructure development and farmers' income in the rural areas have been given an in-depth attention by some scholars (Baiyegunhi et al., 2019). Unlike African countries, advanced economies such as North America and Europe have given a holistic and proactive attention to rural development and farmers' wellbeing (Otekhile and Verter, 2017). Rural farmers are mostly constrained by the dwindling earnings from agricultural and non-agricultural activities (Meemken and Bellemare, 2020). Poor infrastructure and low income owing to low outputs, and the

high cost of production are considered to have had adverse implications on the well-being of emerging farmers across African countries such as Nigeria and Kenya (Otekhile and Verter, 2017). The link between agriculture, rural infrastructure, and farmers' income are important given that agriculture is the mainstay of the economy, the largest source of employment and income generation for majority of rural dwellers in most of the African countries (Sumane et al., 2018).

To reduce unemployment rate, food insecurity amongst small holder farmers, and improve farmers' income, Lagos state government has assisted young farmers with start-up funding. They also went to an extent of training young people on farming before they could allocate them a farming land. Agriculture in Africa is expected to meet the dual objectives of providing food and helping people to escape poverty (Gassner et al., 2019). According to Gassner et al. (2019), if the gap between actual and potential yields can be closed, it will improve the yield rate and ultimately put enough food on the farmers' table while leaving some surplus to sell as a means to generate income.

Southern Africa region is an area typical of many countries in Africa where continued threats to the world's land resources are compounded by the need to raise food production and reduce poverty. For most of the African countries, agriculture continues to be a strategic sector which is aimed at developing and advancing such countries (Wodajo et al., 2020). The agricultural sector is considered as a cornerstone of the developing countries in Africa as it contributes 35% of the gross domestic product, offers 70 to 80 % employment, and provides livelihoods to over 76% of smallholder farmers who constitute the bulk of food producers (Mango et al., 2017). Never the less, food insecurity remains a multidimensional challenge caused by a decline in staple food production which is attributed to a number of factors such as lack of funding, old farming practices, low productive capacity, increased frequency and intensity of cyclical droughts, and a lack of other inputs necessary for maximum production (Gassner et al., 2019).

To address the issues of income generation and food insecurity amongst emerging farmers, contract farming was introduced. This tool is used to mitigate prevalent market failures and also to reduce the risks facing emerging farmers (Meemken and Bellemare, 2020). Contract farming allows the farmer and the buyer to enter into a pre-

harvest agreement which places conditions on the supply of agricultural product (Sifundza, 2019). While contract farming can lead to reduced transaction costs and bring about uncertainty around prices and marketing options, it may also improve farmers' access to extension, financial services, and farm input thereby enabling farmers to increase productivity and improve product quality which ultimately impact their income positively. Although contract farming is effective, farmers need to satisfy a number of pre-requisites such as ownership of land which can lead to exclusion and marginalisation of the poorest population segment in the rural areas (Meemken and Bellemare, 2020).

Besides contract farming, most of the developing countries in Africa have identified extension services as a means to assist emerging farmers with generating income and ensuring the improvement of food security (Baiyegunhi et al., 2019). Agricultural extension services help to strengthen the resilience of small scale and emerging farmers by providing advisory services, information, and knowledge that is useful in making farm level decisions and increasing their level of access to tangible resources such as quality inputs and essential tools aimed at increasing agricultural productivity (Baiyegunhi et al., 2019). To add on that, extension services facilitate better technological choices and diversification of farming activities through the creation of awareness, dissemination of information, and training which contribute towards increased agricultural productivity and households' income (Wodajo et al., 2020).

### 2.3.2 Income generation through livestock farming

Livestock are an important component of small holder farmer livelihoods in most of the African developing countries (Wodajo et al., 2020). It makes a distinct contribution to the social and economic development of the rural masses (Nkonki-Mandleni et al., 2019). In many African countries including South Africa, many rural households earn a living from livestock farming and consider keeping it as a store of wealth (Nkonki-Mandleni et al., 2019). Besides providing draught power, milk, meat, manure, hides, and skins, they also serve as a source of cash income and has a great potential to alleviate household food insecurity and poverty, says Nkonki-Mandleni et al. (2019). For maximum production and higher income generation, small holder livestock famers need to move towards more intensified farming systems (Salmon et al., 2018).

### 2.3.3 Income generation through crop and vegetable farming

In many African countries, cultivated maize can be processed into many forms for both human and livestock consumption. Studies have shown that sustainable intensification of maize production can ensure equitable income growth and food security amongst the poor farming households and also bring about sustainable development (Ogunniyi et al., 2021).

As an important sector of the economy, vegetable production plays a significant role in determining economic conditions for farmers as they are efficient to generate cash even from a small plot of land in a short period of time (Rai et al., 2019). Vegetable cultivation supports smallholder farmers primarily through food provision, income generation, and employment (Gebru et al., 2019).

## 2.4 Challenges faced by emerging farmers

### 2.4.1 African perspective (Challenges faced by emerging farmers in developing countries)

Despite facing considerable challenges in access to productive resources and advisory service delivery, smallholder farmers contribute significantly to agricultural production and food security across Africa (Kamara et al., 2019). Addressing the challenges faced by smallholder farmers and improving the productivity of their sector has the potential to help rural populations escape poverty, said Kamara et al. 2019. Due to lack of skills and resources required to engage in commercialised agriculture, smallholder farmers in Africa still produce in agricultural systems that are characterised by both low input and low outputs (Abdul-Rahaman and Abdulai, 2018). Other major challenges facing smallholder farmers in Africa include less competitiveness, lack of capital assets for sustainable and adequate food production, and climate change added Muimba-Kankolongo (2018).

#### 2.4.1.1 Lack of access to financial assistance

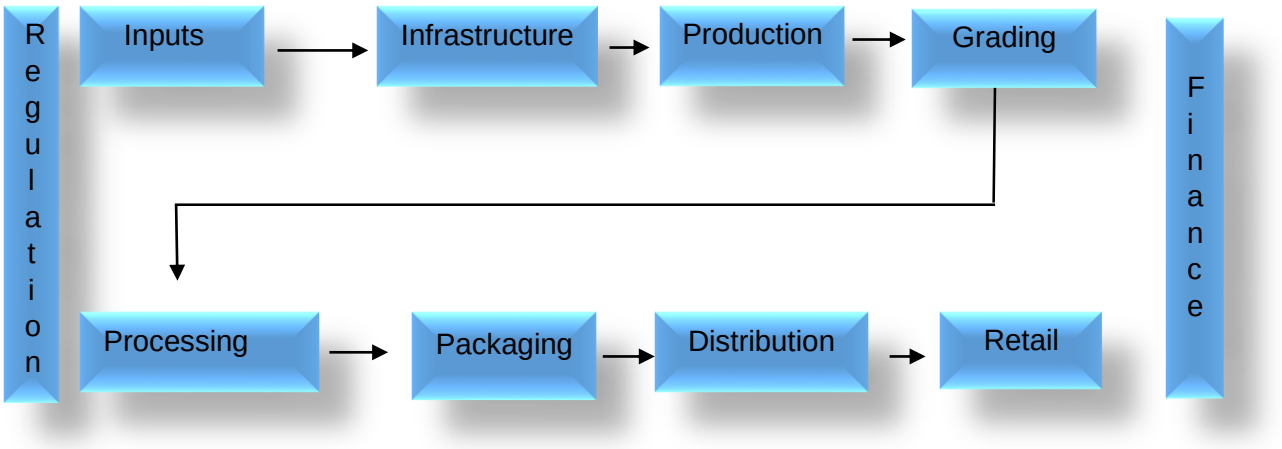


Figure 2: Market-orientated agricultural sector value chain
Source: (Mtombeni et al., 2019)

As indicated in Figure 2 above, access to finance is an essential factor of the agricultural sector value chain which enables emerging farmers to purchase essential inputs and infrastructure necessary for the production process, gardening, processing, packaging, and distribution of their produces (Mtombeni et al., 2019). Finance is also required where there are regulatory requirements such as licencing and certification which the farmer must have. Finance is needed in order to fulfil each and every step indicated in the value chain below and lack of such funds ultimately have a negative impact on the production and income generation by the farmer (Madibana et al., 2020).

Although credit is one of the most significant bases of capital accumulation and may be viewed as a device for providing the foundation for increased production efficiency and income, it is unfortunate that farmers in communal areas of South Africa have limited access to affordable credit (Von Loeper et al., 2016). The poor access to agrarian and support services experienced by farmers is attributed to socio-economic factors together with the constraints relating to financial institutions due to high risk and transaction costs (Minot, 2018).

While most of the retailers require that farmers meet their requirements, majority of emerging farmers still struggle to meet such requirements as stipulated by the retailers. Amongst others, these requirements include pack house, cold rooms, full traceability, and product, soil, and water analysis which come at a great price which

even commercial farmers can hardly afford, let alone struggling emerging farmers (Von Loeper et al., 2016).

#### 2.4.1.2 Lack of access to land and water rights

Land for agricultural practices remains a challenge for emerging farmers (Von Loeper et al., 2016). Due to lack of title deeds, majority of these farmers still do not have access to land and water rights (DAFF, 2013). This is further exacerbated by the lack of policy coordination between the Department of Agriculture Land Reform and Rural Development which is responsible for the allocation of land and the Department of Water and Sanitation which ensures that farmers have the necessary water rights (Von Loeper et al., 2016).

In the study conducted by Kativu et al. (2020), it was indicated that emerging farmers in South Africa are facing increased pressure to manage water use due to growing scarcity and environmental water demand. Due to these pressure, there is a need to build resilient irrigation systems particularly for emerging farmers (Kativu et al., 2020). It was highlighted in the same study that construction of these resilient systems in highly recommend for areas like Limpopo where crop and animal production has been hampered by water scarcity for a long period (Kativu et al., 2020).

#### 2.4.1.3 Lack of access to inputs

Agricultural inputs in the context of this research project are the products and resources used for farming. These include animal feed, compost and fertilizers, seeds, plant protection products such as chemicals, cleaning agents, and additives used in food production (Mtombeni et al., 2019).

Escalating prices of fertilizers and together with the high degree of market concentration of fertilizer producers have and continues to deny many emerging farmers access to fertilizers (Ton et al., 2018). Because fertilizer industry is exclusively managed by a few companies both in South Africa and across Africa, it puts the industry in a high demand position which consequently lead to increased prices of fertilizers.

Although different governments have come up with programmes to assist emerging farmers, most are still encountering challenges relating to access to agricultural inputs (Kativu et al., 2020). Farmers still lacks access to good quality and vigorous seeds and fertilizers which are necessary for maximum production. Due to the lack of fertilizers and seeds, farmers are left to make poor decisions relating to seed cultivar and quantity of fertilizer to be applied which ultimately have a negative impact on the farmer's production rate (Ton et al., 2018).

#### 2.4.1.4 Poor infrastructure and logistics

Poor infrastructure continues to impede agricultural activities in developing countries with the key challenge being the lack of agricultural infrastructure such as fencing and farming equipment. Insufficient market facilities and transport systems are the most imperative infrastructures that to date have and continues to hinder agricultural progress in most of the developing countries (Kativu et al., 2020). According to Kativu et al. (2020), poor rural road networks have left emerging farmers in some of the African countries with no choice but to rely on inefficient and unreliable forms of transportation such as animals for the transportation and distribution of their products (Von Loeper, et al., 2016). To add on that, underdeveloped roads often lead to high transportation costs for agricultural products and farm inputs which results in reduced farmer's competitiveness (Kativu et al., 2020).

In short, rural infrastructure is regarded as an impediment to the free operation of markets as it limits market access by both farmers and logistics companies. Due to lack of incentives, logistics companies are unable to collect products from famers in areas where there is poor road infrastructure. It is important to note that infrastructure relating to agriculture is not only limited to road but also include on-farm infrastructures such as agricultural machinery, boreholes, windmills, building supplies and off-farm infrastructure such as packaging, handling systems, storage facilities, and transportation (Mtombeni et al., 2019).

#### 2.4.1.5 Poor education and farming skills

South African agricultural sector is made up of both developed commercial farmers and a large number of smallholder farmers (NDA, 2006). While that stands, in terms of actual production yield, education, and technological know-how, they are still in the

hands of white commercial farmers (Von Loeper et al., 2016). The challenge for South Africa is therefore to bring the previously excluded black farming community into the mainstream agricultural economy through access to education and information, (Von Loeper et al.,2016).

High economic growth and food security will not be achieved in South Africa until the problems of illiteracy and low educational levels have been addressed. The latter are mostly persistent in the rural parts of the country where agriculture is most likely to play an important role in resolving both economic and human development challenges (Von Loeper et al., 2016). Education and training on issues relating to sustainable use of agricultural natural resources is necessary in ensuring that emerging farmers make productive contributions to the agricultural economy of their communities and enhance food security (Kativu et al., 2020).

#### 2.4.1.6 Climate change

One of the biggest challenges facing smallholder farmers across Africa is climate change. Climate change presents itself in the form of high temperatures, drought, bush fires, floods, soil salinity, and shifts in the rain seasons which ultimately have a negative impact on crop and livestock yield and production, food security, and livelihoods of farmers (kamara et al., 2019).

### 2.4.2 South African perspective

Despite the positive attempt to institutionalise participatory extension system in South Africa, the government's impact in ensuring equity among farmers in terms of racial and gender representation, access to land, inputs and agricultural information has not materialised (Baiyeganhi et al., 2019). Emerging farmers in South Africa are still faced with multiple challenges ranging from unsustainable farming practices, climate change, poor education, poor infrastructure and logistics, and lack of access to markets and credit (Sumane et al., 2018). These challenges are not only experienced by South African emerging farmers but by most of the emerging farmers operating in developing countries in African.

### 2.4.3 Challenges faced by emerging farmers in Makhado Local Municipality

The majority of emerging farmers are still lagging behind in agricultural production because they lack capacities for fruit and vegetable processing, cold storages for the fruits bought off and packing machines to pack it up properly (Sikhweni and Hassan, 2014). Without installing some of these facilities one could hardly expect its due marketing, which is essentially the most important prerequisite for agricultural development (Makhado Local Economic Development Strategy, 2013).

Poor physical access to local, regional and international markets is one of the significant barriers to greater agricultural productivity especially for emerging farmers. Cost effective, reliable, timely and fit for purpose transport is often not available. A lack of timely transport is one of the reasons that devastating proportions of the harvest are wasted and why accessing markets is so challenging. High transport costs are also exacerbated by the high prices of diesel which is also used for tractors and water pumping generators (Makhado Local Economic Development Strategy, 2013).

# Chapter 3: Research methodology

This study was conducted in Makhado Local Municipality, Limpopo Province in South Africa. This municipality is one of the four local municipalities found in Vhembe District Municipality.

## 3.1 Description of study area

Named after the 19th century Venda king, Makhado Municipality is a category B local municipality situated within Vhembe District in Limpopo Province, South Africa as indicated in Figure 2 and 3 below. It shares its borders with Musina in the north, Greater Giyani in the south, Thulamela in the east, and Molemole in the west (Municipalities of South Africa, 2021). The municipality is made up of 97.3% black Africans, 0.2 % coloured, 0.4 % Asian, and 2.0 % whites. The most popular languages are Venda with 68 % and Tsonga with 22.1% followed by Northern Sotho and Afrikaans.

Agriculture is one of the most important sector in Makhado Local Municipality. Besides Macadamia Nuts, Makhado is also a major producer of avocados and other subtropical fruits such mangoes, litchis, and bananas. These subtropical fruits are either sold to outside markets or used in the manufacturing of juice, achar, dried fruits, and pulp (Makhado Local Municipality, 2013). Agricultural sector provides employment for 17% of its total population and it is more predominant in areas such as Levubu Valley, Soutpansberg, and Makhado town.

Subsistence agriculture forms as integral part of the community life, and it is one of the main community based economic activities and survival strategies (Makhado Local Municipality, 2013). Activities within the municipality range from homestead and community gardens which are dominated by the production of fresh vegetables, crop production systems which include the production of maize mainly for household consumption, and livestock farming of cattle, sheep, poultry, game, and goats for own consumption or to sell in order to generate income (Makhado Local Municipality, 2013).

Makhado Municipality has areas with pivot irrigation and high agricultural activity to the west of the town. This corresponds with areas identified as cultivated land. On the other hand, areas to the south-east are mainly used for small-scale farming and

subsistence farming and greatly correspond with Traditional Authority areas (Makhado Local Municipality Integrated Development Plan (IDP), 2020). There are also some areas in the Soutpansberg area (Witvlagroad) as well as Levubu area, where agricultural activities occur. Commercial farming areas and areas with high potential agricultural land are limited to four areas, namely in the west (south of Soutpansberg), north-west (north of Soutpansberg), central (on the Soutpansberg – Witvlag) and in the south-eastern parts Levubu area) (Makhado Local Municipality IDP, 2020).

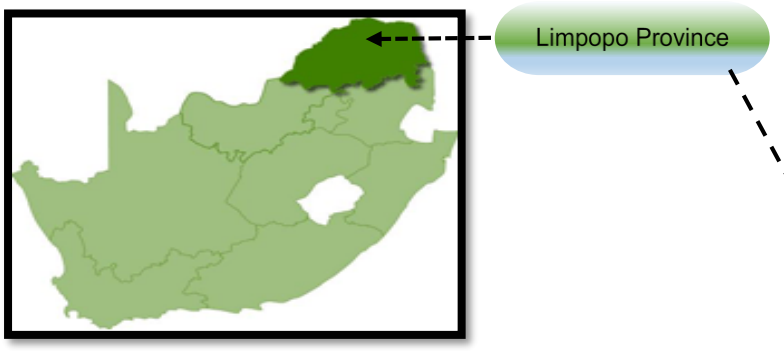


Figure 3: Map of South Africa showing Limpopo Province
Source: Google maps

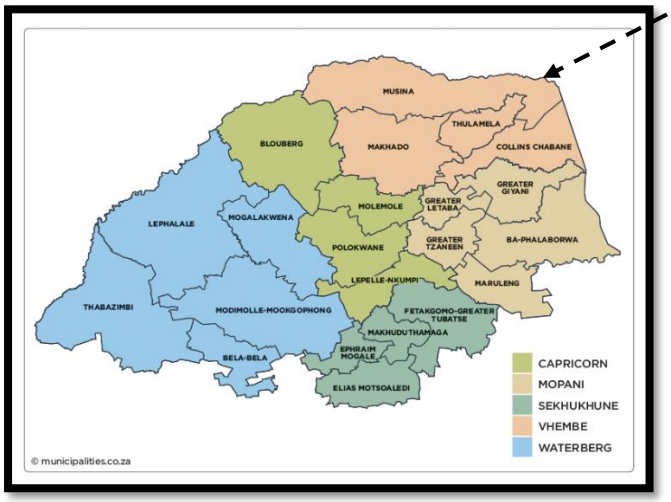


Figure 4: Map of Limpopo Province showing all the district municipalities and local municipalities including Vhembe District Municipality and Makhado Local Municipality
Source: Google maps


Figure 5: Map of Makhado Local Municipality

Source: Makhado Local Municipality: Municipal profile, (2014)

## 3.2 Research design

Research design is the plan that gives guidance on the overall framework for the proposed research and helps the researcher with answering the research questions (McCombes, 2019). It also assists in making decisions about the type of data required, location and timeline for the research, participants and sources, methods for collecting and analysing data (McCombes, 2019). Akhtar (2016), described research design as the glue that holds together all the components in a research project.

This study adopted a quantitative non-experimental research design, as it sought to describe food security phenomenon among emerging farmers within Makhado Local Municipality. This design involves the description of a situation as it stands or describing a relationship between two or more variables without any interference from the researcher. Quantitative research method deals with quantifying and analysis variables in order to get results. It involves the utilization and analysis of numerical data using specific statistical techniques to answer questions like who, how much, what, where, when, and how many (Oberiri, 2017). Expatiating on this definition, Aliaga and Gunderson (2002), describes quantitative research methods as the explaining of an issue or phenomenon through gathering data in numerical form and analysing with the aid of mathematical methods; in particular statistics. Under this design, descriptive survey will be used as it allows for the collection of information by

interviewing and administering questionnaire to a sample of individuals or respondents.

The same design was used by Morshedi, Lashgarara, Hosseini, and Najafabadi (2017) to study the role of organic farming for improving food security.

## 3.3 Sampling

The study was conducted in Makhado Local Municipality. The researcher tried to reach out to both Vhembe District Municipality and Makhado Local Municipality in order to get a number of emerging farmers. None of them could confirm the total number of emerging farmers in the study area (Makhado Local Municipality). Since the population of the emerging farmers within the study area was unknown, the researcher decided to use the Z score technique in order to determine the sample size for the research.

The following terminologies were imperative in the implementation of Z score technique:

- Margin of Error (Confidence Interval): No sample will be perfect, so the researcher decides how much error to allow. In this research, the researcher will allow 10%. This is simply the +/- number that can either be added or subtracted from the sample. The confidence interval determines how much higher or lower than the population mean the researcher is willing to let the sample mean fall.
- Confidence Level: How confident do you want to be that the actual mean falls within your confidence interval? While the most common confidence level is 90%, 95%, and 99%, the researcher has decided to use 95% confidence.
- Standard of Deviation: How much variance do you expect in your responses? the safe decision is to use 0.5 which is the most forgiving number and ensures that the sample will be large enough.

Necessary Sample Size = (Z-score)2 * StdDev*(1-StdDev) / (margin of error)2

For the purpose of this research the equation above was computed as follows:

$N= (1.96)^2 \times (0.5)\ (0.5) / (0.2)^2$

Based on the statistical equation above, sample size which was required for this research was 96.

On the other hand, it was established in the study conducted by Bullen (2017) that for a sample to be representative of the population, at least 10% of the population is necessary to form the sample as long as the population is not more than 1000.

This study focused on vegetable, crop, ruminant livestock farmers and poultry farmers. While that is the case, the sample would have been clustered per agricultural zone, prior to being proportionally and randomly selected once the actual population has been ascertained during field visits.

Example of how respondents would have been selected: Brief description on population, sample, proportionality, simple random sampling is illustrated below:

Table 1: Table explanation of the sampling process

| Ward/Zone | No of farmers | % (ward) Number of farmers per zone/population | Sample size per zone/ward |
|---|---|---|---|
| 1.Sinthumule Kutama | 13 | 0.07 | 7 |
| 2.Pfumbada | 23 | 0.13 | 13 |
| 3.Mphaila | 23 | 0.13 | 13 |
| 4.Mbhokota | 24 | 0.13 | 13 |
| 5.Bungeni | 09 | 0.05 | 5 |
| 6.Rhibungwani | 29 | 0.16 | 16 |
| 7.Majosi | 31 | 0.17 | 17 |
| 8.Madobi | 30 | 0.16 | 16 |
| Total population | 182 | 100 | 100 |

Source: Generated from study results

After calculations, simple random sampling technique was used to randomly select respondents from the different wards or zones. Random sampling gave all emerging farmers an equal opportunity to be selected to be part of the study.

Table 1 shows the results of the sample sizes that would have been utilised had the researcher used proportionality and simple random sampling method.

While it was the researcher's intention to use the sampling method that is explained above; due to a small population number of emerging farmers that were identified, the researcher found no reason to sample but to rather collect data from all the 182 emerging farmers that were identified. This is referred to total population sampling and is a type of purposive sampling techniques which is appropriate in cases where the population size is relatively small like in this study and when the population shares an uncommon characteristic (Etikan et al., 2016)**.**

## 3.4 Data collection

Both quantitative and qualitative data were collected in order to satisfy the objectives of this study. Mixed method approach was suitable for this study as it allowed the collection of data for all three objectives while for objective three, qualitative method was employed as respondents were allowed to express themselves as they narrate the challenges they were faced with. Both structured and unstructured questions were used for collection of data mainly for objective 3.

Primary data was sourced from participating emerging farmers (respondents) through questionnaires. In order to access the respondents; agricultural officials, farmers' organisations, and local authorities were liaised with in order to get permission to interact with respondents.

The employed questionnaire was divided into three sections namely, the socio-economic characteristics of respondents, farm specifics, and challenges faced by respondents. The questionnaire was pre-tested on a small scale in order to gain information to improve the efficiency of the main survey by determining relevance and the quality of questionnaire. After pre-testing, the questionnaire was revised to obtain the final version which was used to solicit information from identified emerging farmers.

**Validity and reliability of data**

For a questionnaire to be considered acceptable, it must possess two imperative qualities which are reliability and validity (Rodrigues et al., 2019). While the former is concerned about the consistency of questionnaire, the latter measures the degree to which the results from the questionnaire agrees with the real world (Middleton, 2019).

Parallel form reliability was applied to measure questionnaire reliability as it allowed for the development of parallel equivalent questionnaire to be developed. Both

questionnaires were used to gather the same information with questions constructed differently (Lau et.al, 2019). The selected respondents completed the two questionnaires and the correlation of the two questionnaires estimated the reliability of the questionnaire.

Steps to validate the questionnaire included the establishment of face validity, and conducting pilot test (Middleton, 2019). Firstly, it was imperative to have people who understood the topic better and go through the questionnaire in order to check if it captured the objectives under investigation effectively. This gave experts an opportunity to check if the questionnaire was not confusing or comprised of leading questions.

The questionnaire was pre-tested on the industry experts and supervisors. Further to that, a total of 10 questionnaires were pre-tested on the intended subjects who are the emerging farmers. Subsequent to finding out that they were reliable, collection of data continued using a similar questionnaire.

## 3.5 Data analysis and modelling

Data analysis is the process of collecting, modelling, and analysing data in order to extract insights that support decision making (Calzon, 2021). All data analysis was largely based on either quantitative or qualitative research methods. Quantitative data analysis included the calculation of frequencies of variables and differences between variables (Calzon, 2021). A quantitative approach is often associated with finding evidence to either support or reject hypothesis that was formed at the earlier stages of the research process (Mc Combes, 2019).

Data collected in this study was analysed using Statistical Package for Social Science (SPSS) version 27.1.0. Binary logistic regression was employed to model the relationship between the dichotomous dependent variable; which in this case was food security and a set of independent variables which were hypothesised to affect the outcome of food security. The independent variables included socio-economic characteristics of respondents and their farm characteristics. The choice of independent variables was informed by the literature review.

Descriptive analysis was used to analyse data collected using Lickert scale; and this referred to challenges faced by emerging farmers. The following paragraphs reflect the actual modelling for each specific objective:

**Objective 1:** Was to determine the impact of socio-economic characteristics of emerging farmers on the net income generated from various farming practices produced by emerging farmers in Makhado Local Municipality.

To explore the key determinants of net income generated from different commodities (as proxy for food security) among the emerging farmers in Makhado Local Municipality, binary logistic regression model was used.

Mathematical representation of logistic regression is presented as indicated below:

$$\text{Log } (P/1\text{-}P) = \alpha + \beta 1X_1 + \beta 2X_2 + \beta 3X_3 + \beta 4X_4 + \beta 5X_5 + \beta 6X_6 + \beta 7X_7 + \beta 7X_8 + \varepsilon$$

In instances where the estimated probability of food security is less than 0,5, it was predicted that food security did not exist. If it was greater than 0,5, food security was said to exist. In the unlikely event that the probability was 0,5, a guess was taken between food security and food insecurity. The food security status was therefore expressed as:

$$Z_i = (\beta_0 + \sum \beta_i X_i)$$

$Z_i$ (value of net income generated by different commodities farmers as proxy for food security):

Food security was expressed as (value of net income generated): $Z_i = (\beta_0 + \beta_i X_i)$

$$Z_i = (\beta_0 + \beta_{gender} + \beta_{age} + \beta_{m/status} + \beta_{edu/level} + \beta_{emplo/status} + \beta_{hh/size} + \beta_{Access/Irrigationwater})$$

Regression determined the strength and character of the relationship between dependent variable (food security) and a series of socio-economic variables of respondents.

Where Z= Food security achievement [If equal/above food poverty line (R 624), not achieved if less than food poverty line]

**Description of the explanatory variables used in the binary logistic regression model:**

The independent variables inputted in the binary logistic regression model to elicit the net income generated from different food products produced by emerging farmers included gender, age, marital status (m/status), education level (edu/level), employment status (emplo/status), household size (hh/size), access to irrigation water, and access to internet use.

Table 2: Factors impacting food quantity production among emerging farmers and their theories

| **Variable (for emerging farmer)** | **Variable label for emerging farmer** | **Theory / variable and explanation** |
|---|---|---|
| $X_{1=\ AGE}$ | Age | +/- : The age of a farmer can generate or erode confidence; in other words, with age, a farmer can become more or less risk-averse to new technology |
| $X_{2=\ GENDER}$ | Gender | +: Female headed households have less access to resources than male head households. As a result, male emerging farmers have a higher chance to be food secure than females. |
| $X_{3=\ MS}$ | Marital status | +/-:People who are married are said to make informed and better decisions about their farming practices which can maximize production compared to those who are single and do not have anyone to share their ideas with |
| $X_{4=\ HHS}$ | House hold size | +/-: Large households will be able to provide the labor that might be required to work in the farm and as a result increasing the chances of maximum production which is necessary even during the harvest season<br>On the other hand, it takes a lot of resources to feed a large household and as a result, the bigger the household size the more the chances of them being food insecure as opposed to households with few members. |
| $X_{5=EL}$ | Education level | +/-: Level of education is assumed to increase a farmers ability to obtain, process and use information relevant |
| $X_{6=ES}$ | Employment status | +/-: Emerging farmers who have other jobs besides focusing on their farms are said to be lagging behind as they have little time allocated to their farming projects. This as a result can have a negative impact of the rate of production.<br>On the other hand, farmers who are employed can use their salaries as another sources of income which can top up their on-farm income |
| $X_{7=AIW}$ | Access to irrigation water | +/-:Emerging farmers who have access to irrigation water are at an advantage of growing quality vegetables and their animals also do not suffer due to drought or lack of water in the rivers |

Source: Generated from literature review

**Objective 2:** Was to determine the household net income (as proxy for food security) generated by emerging farmers from different farming practices in Makhado Local Municipality.

**Household net income was calculated as follows:**

Household net income= net income$_{cabbage}$ + net income$_{sweet\ potato}$+ net income$_{spinach}$ + net income$_{onion}$ + net income$_{maize}$ + net income$_{cattle}$ + net income$_{pig}$ + net income$_{poultry}$ + net income$_{muroho}$ + net income$_{sugarbeans}$ + net income$_{tomatoes}$

**Food security per person per month was calculated as follows:**

Annual average income = household net income from different farming practices/12months

Household net income from different farming practices/ household size= average income per person/per month

As indicated above, in cases where the average income per person per month was less than R642, the household was considered to be food insecure; but in instances where exactly or more than the amount were recorded, then food security existed.

**Objective 3:** Was to identify challenges faced by emerging farmers in Makhado Local Municipality. Challenges facing emerging farmers were evaluated using the Lickert scale questions. The scale will have four options which are strongly disagree if the respondent is not faced with that specific challenge and strongly agree if the respondent has encountered the identified challenge. SPSS descriptive analysis will then be used to analyse the results from the questionnaire. In this way the mean and the standard deviation will be calculated for ordinal data.

## 3.6 Ethical considerations

Agricultural officials, farmers organisations, and local authorities were contacted by the researcher in order for the researcher to obtain permission and access to the respondents. The respondents were required to answer a questionnaire consisting of three sections namely, the socio-economic characteristics of the emerging farmers which covered the demographics in order to attend to the first objective, the second section was made up of farm characteristics which was necessary to achieve the second objective, and lastly, the third section focused on the degree of challenges encountered by emerging farmers in Makhado Local Municipality and in this way the third objective was also covered.

During the completion of the questionnaire, the following ethical considerations were kept in mind:

Voluntary participation*:* Participation in this research was voluntary and no respondent was deceived in order to participate.

Informed consent*:* Respondents were informed about what was expected from them and if there were risks or benefits involved so that they could decide whether or not to participate. This research focused on people who were 18 years and above at the time data was being collected.

Confidentiality and privacy*:* Privacy and confidentiality was taken into consideration throughout the research period. To ensure confidentiality, the researcher ensured that the research data or responses were not disclosed to the public or unauthorised individuals.

Protection of participants' emotions*:* The researcher ensured that the participants' views were respected and participation was voluntary in order to ensure informed consent and that expectations about the outcome and impact of research were discussed fully.

In order to ensure physical safety for both the participants and the researcher, interviews were scheduled early in the day and within working hours. The researcher also gathered background information about the location of the participants so to identify the threats and find a way to minimise the risks. The researcher used a vehicle that was in a good condition to avoid break downs and the mobile phone was always charged in cases of emergency.

After successful capturing and analysing of the collected data, the questionnaires were shredded in order to ensure safe disposal of information collected from respondents.

# Chapter 4: Presentation and discussion of results

## 4.1 Introduction

This chapter seeks to present, discuss, and analyse data collected from the research study area which is Makhado Local Municipality. The results of the study were discussed in relation to the respondents' socio-economic characteristics, farm characteristics, and challenges faced by respondents. Findings were analysed and interpreted in line with the objectives and questions as out lined in the first and third chapters of the study. Tables and figures were used to present data and also to facilitate the understanding of findings. The results presented are based on 2020/2021 production.

## 4.2 Socio-economic characteristics of emerging farmers

### 4.2.1 Introduction remarks

In this section, seven independent variables namely gender, age, marital status, educational level, employment status, household size, and access to irrigation water were cross-tabulated against dependent variable value of income as a proxy for food security. The main aim of this section is to assess whether or not socio-economic characteristics of emerging farmers have an impact on the value of income they generate. The results of this study are based on the farm production for year 2020.

Table 4.1 indicates the distribution of different socio-economic characteristics of emerging farmers who formed part of this study. Generally; 40.1% of emerging farmers within MLM are females and the remaining 59.9% makes up the male representative which proves that male emerging farmers are dominant in the study area. Interesting to note is that; Table 4.1 illustrates that most (31.5%) of these farmers have been through some form of secondary phase studies followed by more than a quarter (26.6%) of those who have completed post matric (certificates, diploma, or degree) qualifications.

Table 4.1 further shows that middle adults make up most (35.2%) of these emerging farmers followed by the elderly at 28.0%, young adults at 27.5%, and the lastly the youth at 9.3%. Another important factor to note is that at the time the data was being collected, almost three quarters of these emerging farmers confirmed that they were

married and 94% of them were full time farmers. 43.2% of these farmers reported that their households were made up of 4-6 members. Sadly, 81.3% of respondents confirmed that they had no access to irrigation water.

Table 4.1: Socio-economic characteristics of emerging farmers within MLM irrespective of the income they generated from various farming practices

| Variables | Frequency | Percentage |
|---|---|---|
| Gender | | |
| Female | 73 | 40.1 |
| Male | 109 | 59.9 |
| Age spread | | |
| Young | 17 | 9.3 |
| Young adults | 50 | 27.5 |
| Middle adults | 64 | 35.2 |
| Elderly | 51 | 28.0 |
| Marital status | | |
| Married | 133 | 73.1 |
| Not married | 49 | 26.9 |
| Education level | | |
| Primary | 33 | 17.9 |
| Secondary | 58 | 31.5 |
| Matriculated | 29 | 15.9 |
| Post matric studies | 49 | 26.6 |
| No formal education | 13 | 6.5 |
| Employment status | | |
| Full time farmer | 171 | 94 |
| Part time farmer | 11 | 6.0 |
| Household size | | |
| 1-3 | 18 | 10.1 |
| 4-6 | 77 | 43.2 |
| 7-9 | 59 | 33.2 |
| >9 | 28 | 15.4 |
| Access to irrigation water | | |
| Yes | 34 | 18.7 |
| No | 148 | 81.3 |

Source: Generated from study results

### 4.2.2 Net income per person per month per gender

Gender is an imperative factor as it gives the full picture of who is mostly involved in farming. Beside that; Leslie et al. 2019 reported that gender and sexual dynamics affect land management decisions, access to resources, and subsidies which

ultimately brings sexuality into food justice and demonstrates the centrality of gender and sexuality to agricultural sustainability.

As indicated in Table 4.2, the results from this study show that farming within MLM is a male dominated space with 52.4% emerging farmers being males. While that is the case, more than a quarter (28.2%) of these male emerging farmers who are also considered the main household heads have been able to generate an income between R1-R199 per month per person from their different farming practices while 33.8% of female emerging farmers were able to generate income within a similar range. Table 4.2 further illustrates that almost 15 (14.8%) male emerging farmers out of every 100 have been able to generate at least R 624 per person per month for the year 2020 while only 5.6% of their female counterparts were able to generate income within the same range.

These results are in concurrent with what was reported in the literature review whereby it was indicated that households that are headed by male emerging farmers in Lesotho were found to be more food secure compared to those households that were headed by their female counterparts (Muroyiwa and Ts'elisand, 2021).

Table 4.2: Income range per person per month per gender

| Monthly income range | % of gender contribution | | |
|---|---|---|---|
| | Female | Male | Total |
| R1.00-R199.00 | 33.8 | 28.2 | 62.0 |
| R200.00-R499.00 | 4.9 | 6.3 | 11.3 |
| R500.00-R623 | 1.4 | 4.9 | 6.3 |
| R624.00-Above | 5.6 | 14.8 | 20.4 |
| Total | 45.8 | 54.2 | 100.0 |

Source: Generated from study results

In a study conducted in South Africa, it was confirmed that there is a small percentage of women involved in farming which can be attributed to the general idea among the traditional South Africans who believe that farming is mainly for males rather than females (Ntshangase, 2018). The study conducted in Kwazulu-Natal found that 72% of emerging farmers in the province were males and this imbalance between male and female farmers was said to contradict the idea that agricultural activities remain the

responsibility of women as their male counterparts move to big cities in order to seek better employment opportunities (Ngarava et.al, 2019).

Important to note is the fact that out of the 20.4% emerging farmers who managed to generate a net income of at least R 624 (food poverty line), only 5.6% were females. These results are not surprising given that in one of the studies conducted in South Africa; it was reported that the poverty incidence was higher among the women-headed households compared to men-headed households (Maziya et al., 2020). This means that the severity of poverty is higher among women than men. Overall; the same study suggested that in South Africa, poverty is gendered; females bear a significantly higher burden of poverty than their male counterparts (Maziya et al., 2020).

### 4.2.3 Net income per person per month per age

This section is important as it explores income generated per age group of emerging farmers within MLM. Age is an important factor as it contributes towards the rate of production by the farmer. It was reported that the future of agriculture can be jeopardised due to an aging farming population and waning interest of rural youth in agriculture (Nandi and Nedumaran, 2021). An older average farmer is linked to the low uptake of technology while the younger generation have grown up with internet technology and therefore possess greater skills and an awareness of the advantage of such technology (Bowen and Morris, 2019).

Table 4.3: Income range per person per month per age spread

| Monthly income range | % of age contribution | | | | |
|---|---|---|---|---|---|
| | Youth(18-35) | Young adults(36-55) | Middle adults(56-65) | Elderly(66 and above) | Total |
| R1.00-R199.00 | 2.1 | 15.5 | 26.8 | 17.6 | 62.0 |
| R200.00-R499.00 | 2.8 | 2.8 | 4.2 | 1.4 | 11.3 |
| R500.00-R623 | 0.7 | 2.1 | 2.1 | 1.4 | 6.3 |
| R624.00-Above | 2.8 | 9.2 | 5.6 | 2.8 | 20.4 |
| Total | 8.5 | 29.6 | 38.7 | 23.2 | 100 |

Source: Generated from study results

Table 4.3 illustrates that most (38.7%) emerging farmers within MLM are made up of middle adults (56-65 years), followed by 29.6% of the young adults (36-55 years), and only 8.5% of youth (18-35 years). Out of this 38.7% of middle adults, most (26.8%) of them were unable to generate an income of at least R200 per person per month from their different farming practices. On the other hand, only 9.2% of young adults out of 29.6% have been able to generate a net income per person per month of at least R624 (poverty line).

While this percent is not even tenth of the total population, it remains the highest compared to middle adults (5.6%), elderly (2.8%), and youth (2.8%). Interesting to note is the fact that 2.8% out of 8.5% of all the youth involved in farming were able to generate an income of at least R624. They were the only ones who had a less percentage of those who generated between R1-R199 (2.1%) compared to those who generated R624 (2.8%). In other cases; those who generated between R1-R199 were always greater than those that generated R624. These statistics show that there is a great chance of success amongst young emerging farmers.

Table 4.3 also indicates that only 2.8% of young people who were involved in farming were able to generate a net income of R624 per person per month and 9.2% of young adults were able to generate the same amount. Mthi et al., (2021) reported that youth, who make up the majority of South Africa's population and will be the future responsible citizens, confront numerous obstacles, including a lack of access to land, finance, markets, practical training, and incentives. The low interest of youngsters in agriculture is attributed to the poor status of agricultural output in Africa's rural areas due to a lack of government support (Mthi et al., 2021).

Referring back to the literature review; the result illustrated in Table 4.3 are in contradiction with what was reported by Ogunniyi et al. (2020) who had indicated that households that are headed by people who are below the age of 25 did not experience food insecurity in Nigeria. Be that as it may, Muroyi and Ts'elisand (2021) stated that in Lesotho, households that are headed by older people turn to be more food secure compared to those headed by young farmers. While both these results do not match the results found in this study, the study conducted in Lesotho at least indicated that with an increase with age, the odds of being food secure also increase.

Myeni et al. (2019) also found that 41% of the emerging farmers in the Eastern Free State are between 52 and 66 years old. These findings affirm the fact that majority of emerging farmers are indeed middle adults aged which is also established in this study. Literature has shown that in South Africa, only 26% of young people consider agriculture as an exciting career path (Metelerkamp et al., 2019). While that is the case, Zmija et al. (2020) further established that just above a quarter (27%) of young people are involved in agriculture, both in the European and African regions which was attributed to the fact that majority of young people acquire education and thereafter moved to bigger cities in search of better employment opportunities.

### 4.2.3 Net income per person per month per marital status

Marital status of respondents is important because it is assumed that married people are in a better position to qualify for financial assistance they have a better chance to make informed and better decisions relating to their farm production. It is therefore important to look at this factor in details as it is assumed that it affects the rate of production by the emerging farmers.

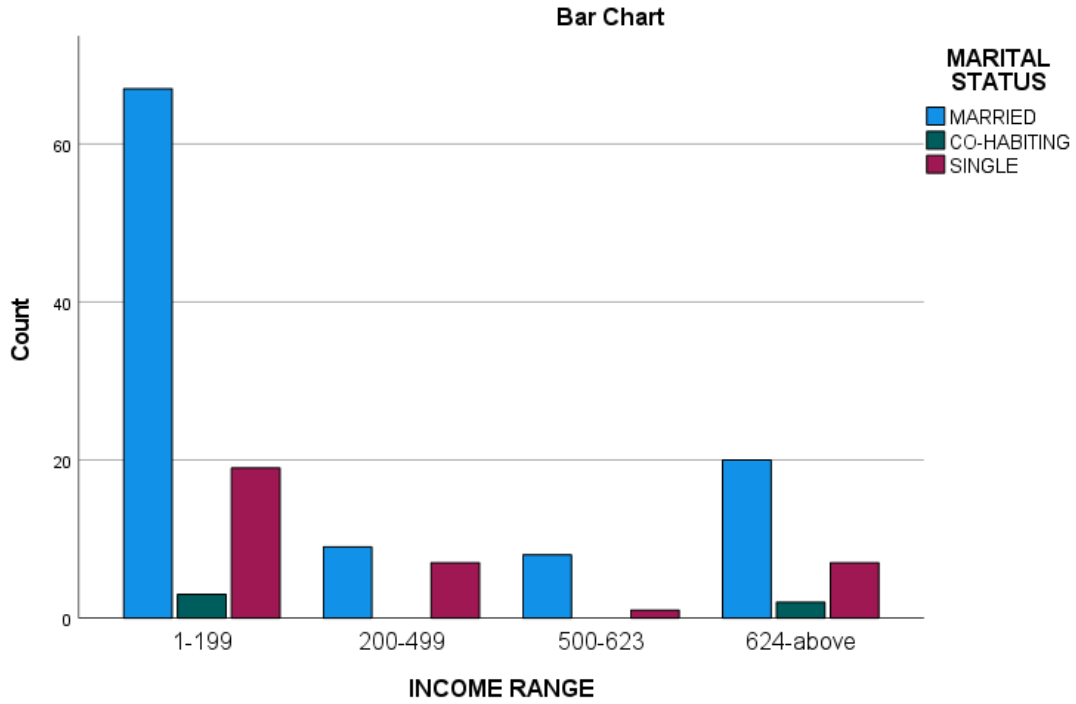


Figure 4.1: Relationship between marital status and net income per person per month
Source: Generated from study results

Figure 4.1 in blue colour shows that more than 110 emerging farmers confirmed that they were married while the remaining 46 reported to be either single or co-habiting. Out of 110 emerging farmers who confirmed to be married, only 20 (or 18.1%) of them were able to generate an income of at least R624 per person per month and majority (more than 60) generated less than R200 per person per month.

The results in this study do not differ from the study conducted by Uhunamure et al., (2021) who found that almost 3 quarters (69.4%) of farmers in South Africa are married. An increased number of married emerging farmers can be attributed to their age and the era in which they grew up as old people believe in marriages and are more family aligned (Nxumalo et.al, 2019). Muroyiwa and Ts'elisand (2021) also confirmed that households that are headed by married people stand a better chance of being food secure compared to those who are not married.

### 4.2.4 Net income per person per month per education level

Education gives the farmer the ability to explore different farming methods that can possibly assist in enhancing their production and even marketing their products. This factor is important in that it pre determines whether or not the farmer will be able to improve their farming skills or will have to stick to the primitive methods of farming which might be too limiting.

Table 4.4: Income range per person per month per education level

| Monthly income range | % Education level | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Primary** | **Secondary** | **Matriculated** | **Post matric certificate** | **Diploma or degree** | **No formal education** | **Total** |
| R1.00-R199.00 | 12.7 | 21.8 | 5.6 | 4.2 | 13.4 | 4.2 | 61.4 |
| R200.00-R499.00 | 0 | 3.5 | 2.1 | 0 | 3.5 | 2.1 | 11.3 |
| R500.00-R623 | 1.4 | 2.1 | 0.7 | 1.4 | 0 | 0.7 | 6.3 |
| R624.00-Above | 1.4 | 4.9 | 7.0 | 2.1 | 4.2 | 0.7 | 20.4 |
| Total | 15.5 | 32.4 | 15.5 | 7.7 | 21.1 | 7.7 | 100 |

Source: Generated from study results

It is evident from Table 4.4 that majority (76.7%=32.4%(secondary) + 15.5%(matriculated) +7.7%(post matric certificate) +21.1%(diploma or degree)) of emerging farmers within MLM have been through secondary phase of their studies. This Table also illustrates that 20.4% of emerging farmers were able to generate an income equal or more than the food poverty line. 7.0% of emerging farmers who managed to generate a net income that was equal or more than the food poverty line indicated that they had completed only matric with only 4.9% stating that although they did not complete matric; they did go through some form of secondary phase studies. About 6.3% of emerging farmers who were able to generate income above the food poverty line confirmed that they either held a post matric certificate (2.1%), diploma, or a degree (4.2%).

It is evident from Table 4.4 that about 6 out of every 10 (i.e. 61.4%) emerging farmers were unable to generate an income of at least R200. The highest percentage (21.8%) of those who were unable to generate a net income of at least R200 per person per month composed of respondents who had been through high school but did not complete matric followed by 13.4% of respondents who maintained that they hold either a diploma or degree. Interesting to note is that almost half (7.0% out of 15.5%) of respondents who have matriculated were able to generate an income that is equal or more than the food poverty line.

As previously indicated, education is believed to be imperative as it influences the adoption of new technological innovation by the farmers and thus enhancing their productivity and better their production (Uhunamure et al., 2021).
The findings in this study seems to contradict with what was reported by Ogunniyi et al. (2020) who maintained that with more educational attainment by the head of the household, the level of vulnerability to food insecurity decreases. While education is important, it does not seem like it has much impact on the rate of net income generated by an emerging farmer. This is supported by the fact that most of the highly educated farmers at 13.4% were found to be falling within the R1.00 and R199.00 bracket.

### 4.2.5 Net income per person per month per employment status

Employment status of an emerging farmer is one of the key factors that will determine the production rate from different farming practices.

According to Table 4.5, almost all (94.4%) respondents are full time emerging farmers. It is further illustrated in the same table that more than half (57.7%) of these full time emerging farmers were able to generate an income of between R-199 per person per month. Further to that, almost a fifth (20.4%) of full time emerging farmers earned above the poverty line of R624 per person per month.

These findings concur with what was reported by Myeni et al. (2019) indicating that most of emerging farmers in South African are full times farmers and use communally owned land for their production. This is not surprising, given that Vhembe district falls under communal tenure systems in which most of the land legally belongs to the state and is administered by traditional authorities (Sinthumule and Mzamani, 2019).

Table 4.5: Income range per person per month per employment status

| Monthly income range | % of employment status | | | |
|---|---|---|---|---|
| | Permanently employed elsewhere | Fulltime farmer | Ad hoc employee | Total |
| R1.00-R199.00 | 2.1 | 57.7 | 2.1 | 62.0 |
| R200.00-R499.00 | 0.7 | 10.6 | 0.0 | 11.3 |
| R500.00-R623 | 0.7 | 5.6 | 0.0 | 6.3 |
| R624.00-Above | 0.0 | 20.4 | 0.0 | 20.4 |
| Total | 3.5 | 94.4 | 2.1 | 100 |

Source: Generated from study results

### 4.2.6 Net income per person per month per household size

Household size is one of the factors that contribute immensely on the net income generated by emerging farmers. Household size in this study represents the sum of members residing together in a home at the time of the study. With increased household size, there can either be an increase or decrease in net income generated by an emerging farmer. Some big households use the size of their households to an advantage by relying mostly on family to work the land and thus requiring not to pay anyone for the work done in the farm. On the other hand, large household size means that the net income generated from different farming practices will have to be divided amongst many people and thus there will be a decrease in net income per person per month.

Table 4.6: Income range per person per month and household size

| Monthly income range | % of household size contribution | | | | |
|---|---|---|---|---|---|
| | 1-3 | 4-6 | 7-9 | 10 upwards | Total |
| R1.00-R199.00 | 3.5 | 23.4 | 21.3 | 13.5 | 61.7 |
| R200.00-R499.00 | 2.8 | 4.3 | 3.5 | 0.7 | 11.3 |
| R500.00-R623 | 0.7 | 2.8 | 1.4 | 1.4 | 6.4 |
| R624.00-Above | 2.1 | 14.2 | 4.3 | 0.0 | 20.4 |
| Total | 9.2 | 44.7 | 30.5 | 15.6 | 100 |

Source: Generated from study results

According to Table 4.6, about 44.7% of respondents' households are made up of 4-6 people and this percentage is followed by 30.5% households which are made up of 7-9 members. Furthermore, 15.6% of all respondents reported that they are heading households that are made up of at least 10 people and more. Also, most of the emerging farmers that earned an income above the poverty line (14.2 % of the 20.4%) fell within the family size of 4 to 6 members.

Table 4.6 further illustrates that households with 4-6 members are more prevalent (44.7%) in Makhado Local Municipality. More than half (23.4%) of this 44.7% were unable to generate a net income of at least R200 per person per month while 14.2% of them generated a net income of R624 or more which qualified them to be food secure. Table 4.6 further shows that 15.6% of all respondents came from households that had 10 or more members and out of these households, none of them were able to generate an income that is equal or more than the food poverty line. It is also clear from Table 4.6 that with an increasing household size, the odds of being food secure decrease. 14.2% of households with 4-6 members were able to generate a net income of R624 or more. This percentage (14.2%) decreased to 4.3% in households with 7-9 members and was 0 for households with 10 and more members.

The results in this study agree with what was reported in the literature review, where Muroyiwa and Ts'elisand (2021) pointed out that an increase in a number of household members lead to more demands by many and as a result, this ultimately threatens food security as money is spent on many things for a number of people.

Contrary to popular believe, Etwire et al. (2013) reported that household size can be a proxy for family labour. Availability of family labour implies that the household head and members may have time to engage in other activities including participating in an agricultural project which ultimately increase production thereby improving the net income (net income as proxy for food security) (Etwire et al., 2013). The findings in this study are also dissimilar to what was reported by Kortei et al. (2022) who found that large household sizes are likely to increase the labour force required to carry out farm activities, resulting in bumper harvests that will raise the household's food security status.

### 4.2.7 Percentage of access to irrigation water and net income per person per month

Access to irrigation water is one of the important factors that determines the level and quality of production by emerging farmers. In Limpopo Province, scarcity of water for farming remains a major challenge for food production and sustainable development (Maponya and Mpandeli, 2016).

According to Figure 4.2, almost 123 respondents represented by the dark green colour out of a total (represented by both dark green and light blue colours) of close to 150 people reported that they did not have access to irrigation water. Majority (more than 80 respondents) of this 123, falls within the bracket of emerging farmers who generated between R1.00-R199.00 per person per month. More than 20 emerging farmers who agreed to have access to irrigation water were able to generate an income that is equal or above the food poverty line which is highlighted in light blue on Figure 4.2. These counts indicate that almost 80% of all respondents did not have access to irrigation water.

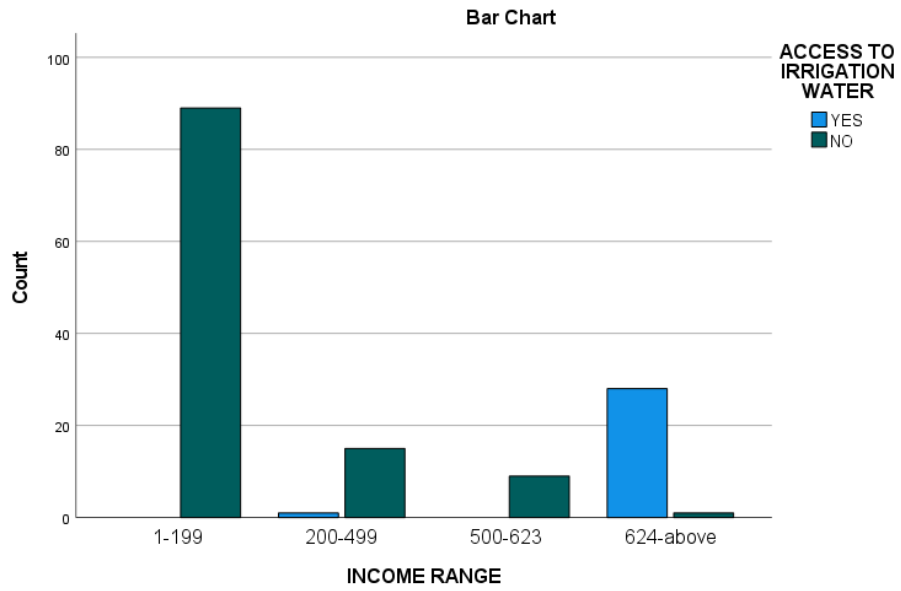


Figure 4.2: Relationship between access to irrigation water and net income per person per month (count=number of respondents)
Source: Generated from study results

The results in this study are in concurrent with what was reported in a study conducted in Vhembe district where it was established that 64% of emerging farmers rely on precipitation to grow their crops and raise livestock (Shikwambana and Malaza, 2022). A study conducted in Vhembe district which indicated that during prolonged drought emerging farmers are hit hard due to their heavy reliance on rain-fed agriculture sector, limited options or their dependency only on rain water, and lack of financial resources (Kom et al., 2020).
Figure 4.2 clearly shows a strong relationship between access to water and net income generated by emerging farmers from various farming practices.

Several studies have concluded that the South African agricultural economy has little room for emerging farmers as there is a lack of strong support systems for the previously disadvantaged farmers and this includes lack of support for accessing water (Chikozho et al., 2020). In the same study, it was established that the South African government's goal to of redistributing land and water whilst maintaining agricultural production to ensure food security has not produced the expected results (Chikozho et al., 2020).

## 4.3 Presentation of net income generated by emerging farmers from various farming practices within MLM.

This section studies the net income generated from different farming practices and which ones have had a positive impact on food security. It further gives a representation of how the net income from various farming practices have impacted food security status of emerging farmers.

Figure 4.3 illustrates that just over 20 respondents are food secure or have managed to generate a net income of at least R624 per person per month from their farming activities. On the other hand, more than 80 respondents reported that they have only been able to generate an income of between R1-R199.

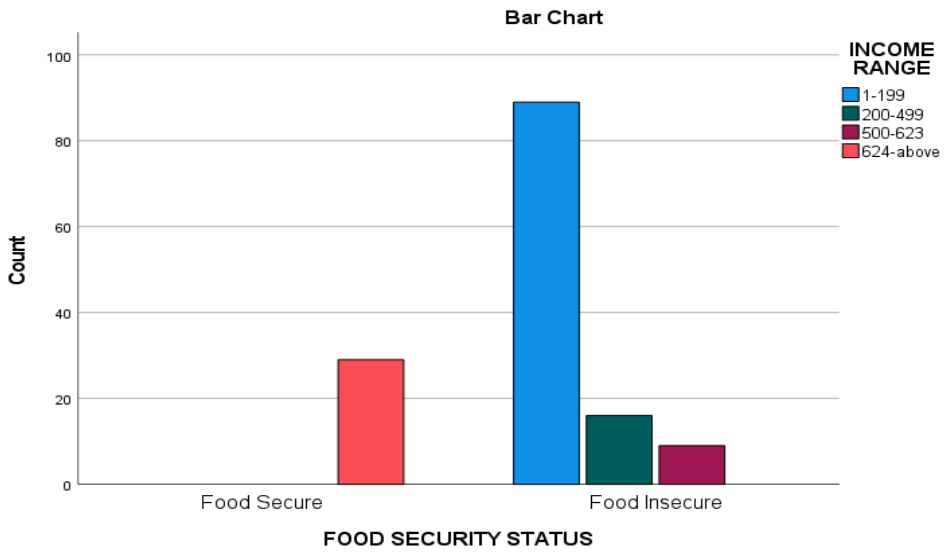


Figure 4.3: Relationship between net income and food security status of emerging farmers.
Source: Generated from study results

Based on these results, one can conclude that it will be impossible for most of the emerging farmers to be food secure if they were to solely rely on the income they generate from farming activities. Most of the emerging farmers in the study area reported that they often assisted by government grants such as old age grants and pension money. They asserted that sometimes they use the government grants to pay up expenses related to their farming activities. Gassner et al. (2019) reported that already in many countries, a large proportion of households that identify themselves as full-time farmers generate much of their income from local non-farm activities and remittances either from urban areas or abroad.

Table 4.7 below gives a descriptive statistical results of net income generated from different farming activities. Variables in Table 4.7 are arranged based on the value of mean statistics, from variable that generated the most to the least mean value in rands. The table further portrays the values of skewness and kurtosis. Based on the output tabulated in Table 4.7; almost all variables listed have shown skewness that is above 1 except for poultry which was 0.66. This means that most of the variables had a positively skewed data set while poultry was the only one which was moderately skewed. Except for poultry, all other variables have exhibited kurtosis that is greater than zero which portrays a leptokurtic data distribution while poultry has shown a platykurtic data distribution of less than -3. A leptokurtic distribution is one which exhibits a sharper than normal distribution around the mean with outliers on the wing while a platykurtic data set is flatter around the mean with outliers on the wings.

Table 4.7 above shows a decreasing order of mean statistic value for different farming activities that emerging farmers within MLM were involved in. The top 3 products that generated the highest mean income are cabbage at R38 141.74, poultry at R33 320.58, and tomatoes at R20 300.37. The results in Table 4.7 also show a big gap between the best and worst performing farmers.

These results concur with what was reported in a study that was conducted in Limpopo province where it was established that cabbage and tomatoes are amongst the most profitable crops within the province (Chauke and Anim, 2013). The big differences in farm returns that are observed in Table 4.7 were also reported in a research which was carried out in the Eastern Cape where it was found that smallholder profit exhibited a highly unequal return which was categorised as a pareto distribution since most smallholders earned a relatively low net farm income relative to the best performing famers (Zantsi et al., 2019).

Table 4.7: Descriptive statistics output of annual net income in South African rands per household generated from different farming activities

| **Descriptive Statistics** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Annual net income 2020/2021 | N statistic | Minimum statistic | Maximum statistic | Mean statistic | Std. Deviation | Skewness | | Kurtosis | |
| | | | | | | Statistic | Std. Error | Statistic | Std. Error |
| Cabbage | 46 | R20,00 | R1000 000,00 | R38 141,74 | R147 095,20 | 6,4 | 0,35 | 43,2 | 0,688 |
| Poultry | 26 | R60,00 | R104 000,00 | R33 320,58 | R30 556,24 | 0,6 | 0,45 | -0,8 | 0,887 |
| Tomatoes | 27 | R60,00 | R242 000,00 | R20 300,37 | R49 191,56 | 3,9 | 0,44 | 16,98 | 0,872 |
| Cattle | 14 | R1 500,00 | R40 000,00 | R15 321,43 | R11 053,38 | 1,1 | 0,59 | 0,43 | 1,154 |
| Spinach | 26 | R10,00 | R35 000,00 | R7 380,00 | R11 083,55 | 1,6 | 0,45 | 1,3 | 0,887 |
| Maize | 31 | R120,00 | R55 000,00 | R5 018,39 | R10 500,51 | 3,9 | 0,42 | 17,9 | 0,821 |
| Muroho | 26 | R100,00 | R50 000,00 | R5 379,31 | R11 042,79 | 3,3 | 0,45 | 11,5 | 0,887 |
| Sweet potato | 31 | R100,00 | R25 000,00 | R4 420,96 | R5 836,41 | 2,3 | 0,42 | 5,6 | 0,821 |
| Sugar beans | 18 | R 200,00 | R1 8000,00 | R4 358,33 | R5 260,29 | 2,2 | 0,53 | 4,0 | 1,038 |
| Peanuts | 12 | R 240,00 | R5 000,00 | R1 790,83 | R1 510,72 | 1,1 | 0,63 | 0,4 | 1,232 |

Source: Generated from study results

Maize ranked number 6 in the list of products that are tabulated in Table 4.7. Although only 31 farmers agreed to having generated income from maize production; almost all respondents indicated that they do produce maize as they mostly rely on it as a staple food. According to the study that was conducted in South Africa, it was reported that maize is the most important crop in South Africa and it is produced everywhere in the country under different environments (Gidi et al.,2018). A lesser (R5 018.39) average income for maize in this study can be attributed to the fact that emerging farmers operate in the rural areas with few buyers competing for their surplus output which has resulted in farmers being reluctant to adopt new technologies and produce for the market (Gidi et al., 2018). Most of the rural emerging farmers produce maize solely to feed the producers' households. In the rural provinces like Limpopo maize is used for different meal preparation besides porridge preparation. In the Venda culture; maize is eaten as tshikoli, which is prepared directly from the field without any form of processing, tshidzimba, and mabundu also form part of food that is prepared using maize. Due to lack of money to buy seed on an annual basis, maize from the previous

harvest seasons can also be used by the farmer in the next production season. It is therefore not surprising to see such a lesser average in the net income generated from maize production; it proves that most of the farmers produce to feed their households rather than to sell. Emerging farmers who have produced more maize can also take their produced maize to places like progress milling and NTK for storage which ultimately allows them to buy maize at a lesser price. These findings are also supported by Zantsi et al. (2018) who reported that crop producers often produce for an extra source of food whilst the second-most important reason for producing was as a main source of food.

Livestock, and especially cattle, fulfil traditional roles as a source of status, a store of wealth in the form of a 'walking bank account', or are kept for slaughter at special functions rather than for commercial production (Whitbread et al., 2011). This is true for this study given that most of cattle farmers indicated that they sell their cattle during events that take place within their communities or nearby areas. Others reported that they slaughter their cattle in order to sell the meet to the local residents and in that way, they generate income.

## 4.4 Challenges that farmers within Makhado Local Municipality are faced with.

In South Africa, a number of studies have been conducted on the topic of commercialisation of emerging farmers (Khapayi and Celliers, 2016). However, there is a remarkable scarcity of scientific information describing a more detailed picture of major challenges that affect emerging farmers within MLM. Khapayi and Celliers, (2016) reported that a better understanding of these challenges can assist in the effective preparation of policies, development strategies, and programmes that are aimed at supporting emerging farmers.

A ccording to Table 4.8 beneath; majority (89.4%) have indicated that lack of markets and finaical assitatnce have been the main reason behind their poor far performance. The results in concur with the study that was carried out in Limpopo Province by Ndlovu et al. (2021) where it was asserted that in comparison with commercial farmers, emerging farmers' productivity is poor and often the quality of products does not measure to market standards. In another study that was conducted between

Limpopo and Western Cape provinces, it was reported that there is little access to agricultural credit and emerging farmers are too poor to satisfy the loan requirements (Ncube, 2020).

Table 4.8: Percentage of respondents' response to identified challenges

| Respondents responses | Frequency | Percentage | Total Percentatge |
|---|---|---|---|
| | Lack of markets and financial assistance | | |
| Agree | 160 | 89.4 | 89.4 |
| Disagree | 19 | 10.6 | 10.6 |
| | Lack of land and water rights | | |
| Agree | 145 | 81 | 81 |
| Disagree | 34 | 18.9 | 18.9 |
| | Lack of access to farm inputs | | |
| Agree | 155 | 87.1 | 87.1 |
| Disagree | 23 | 12.6 | 12.6 |
| | Poor infrastructure onfarm and off farm | | |
| Agree | 102 | 57.3 | 57.3 |
| Disagree | 76 | 42.7 | 42.7 |
| | Low education level and poor farming skills | | |
| Agree | 114 | 64.1 | 64.1 |
| Disagree | 64 | 35.9 | 35.9 |
| | Climate change | | |
| Agree | 136 | 76.6 | 76.6 |
| Disagree | 39 | 22.3 | 22.3 |

Source: Generated from study results

A total of 87.1% respondents reported that lack of farm inputs was a major reason behind the minimal farm production and lastly; farmers (81%) reported that lack of land and water rights was also factoring in negatively towards their production level. In another report by Ncube (2020), it was highlighted that emerging farmers are facing a problem of having access to farming land without access to water and water rights. The issue of water shortage is exacerbated by the fact that majority of black emerging farmers still lack reliable irrigation infrastructure (Ncube, 2020). During the interviews with the respondents, majority of the emerging farmers reported that they were unable to buy inputs due to the fact that they find them to be expensive. Those who could afford on the other hand indicated that no matter how big their land is, they are

propelled to use a small portion of land for production because they still cannot afford to cater for a big area when it comes to seeds and fertilisers.

Although lack of infrastructure was hypothesised to be the reason behind minimal production by the farmers within MLM, Table 4.8 shows that only 53.7% of farmers concurred that it was indeed contributing negatively towards their production and the net income they generate from their farming activities. Some farmers reported that due to poor road infrastructures, sometimes when their produces are ready for selling, they are unable to deliver them to their customers due to lack of transportation.

Table 4.8 further illustrates that a total of 64.1% of all respondendts indicated that their lack of educational skills and lack of farming skills are the reasons why they have not been able to maximise their production and there by increasing the annual net income from different farming practices. These results agree with what was reported by Ndlovu et al. (2021), who indicated that threats to the success of rural agriculture in Limpopo Province include low education levels, limited training opportunities, and failure to adopt and operate new farming technology. In the same study, it was asserted that limited know-how coupled with the absence prompt information source or services result in farmers loosing crops to disease infection, the quality of the products is compromised, and ultimately they experience a decrease in farm output (Ndlovu et al.,2021).

Climate change has also been reported by emerging farmers within MLM as a cahllenge. 76.6% of respondesnt have shown a great concern for a change in rain seasons as they are dependent on rain for irrigation purpose. They maintained that long droughts has resulted in the production of poor quality products which ultimately affects the seeling price negatively. Emerging farmers stated that due to this shift, sometimes they plant a lot but due to a lot of unexpected rain, their plants die out in numbers which ultimately affect their production rate negatively. On the other hand, other farmers indicated that lack of rain has resulted in lack of enough grazing for their animals as they also struggle to get them drinking water due to rivers having dried up.

The results in this study are not surprising given that in another study conducted in Vhembe district, it was established that majority of households headed by women are food insecure and the contributing factors were erratic temperatures and changed

rainfall patterns which ultimately result in failed harvest attributable to climate change and variability (Louis and Matthew, 2020).

### 4.4.1 Other challenges that farmers within Makhado Local Municipality are faced with.

Out of the few challenges that the researcher had highlighted in the questionnaire; the respondents also raised challenges that were not identified by the researcher as indicated in Table 4.9 and they included the production of similar commodities, lack of tractor services, lack of irrigation equipment and other simply refers to the challenges which were not consistent with what majority were raising.

Farmers reported that because most (48%) of them produce similar products, the competition becomes high and at some point they find themselves having to lower prices so much that they no longer make profit out of it. While that is the case, other farmers indicated that they end up fee ding their produces to the pig or just throwing away the farm produces.

Table 4.9: Other challenges faced by emerging farmers within Makhado Local Municipality.

| Other challenges raised by emerging farmers | Other cahllenges | | |
|---|---|---|---|
| | Frequency | Percentage | Total Percentatge |
| Similar commodities | 84 | 48.0 | 48.0 |
| Lack of tractor services | 52 | 28.6 | 28.6 |
| Insufficient irrigation equipment | 33 | 18.9 | 18.9 |
| Other | 6 | 3.4 | 3.4 |
| Total | 175 | 100 | 100 |

Source: Generated from study results

Table 4.9 further shows that; 28.6% of emerging farmers do not have access to government tractors. Farmers reported that the government has established a program through which when a farmer needs tractor services; they should get such services on a discounted price. Although the government has come up with such an intervention, emerging farmers indicated that most of the times these tractors are only brought to them after the ploughing season and therefore render them useless. Those

who can afford private tractors indicated that they hire tractors but because they are expensive, they end up using a small portion of land for their production.

According to table 4.9, 18.9% of respondents indicated that the lack of irrigation equipment has had a negative impact on their production rate. Other farmers indicated that sometimes they use baskets to water their vegetation while others use drips but not of good quality. One of the extension officers further reported that due to lack of irrigation equipment, water for irrigation ends up being misused to mismanagement by the farmers.

Other farmers mentioned quit a number of different issues represented by “other” in Table 4.9. These issues ranged from animal theft, lack of training facilities, lack of storage infrastructure, to farm mismanagement due to lack of skills.

## 4.5 Inferential statistical analysis

### 4.5.1 Diagnostic analysis

Diagnostic analysis is the process of using data to determine the cause of trends and correlations between variable (Ngema et al., 2018). In this study, diagnostic analysis was used to analyse the relationship between different variables and how they impact each other. Bivariate correlation analysis was employed to ascertain whether there is an empirical relationship between two variables in question. As directed by the literature a sum of 7 independent variables were inputted in the model.

The strength of relationship was measured ranging between r=+1 and r=-1. Important to bear in mind is that + indicates a positive relationship while – is indicative of a negative relationship and 0 signifies that relationship between variables does not exist. This means that when a variable has a positive sign, the relationship between the two variables is directly proportional (an increase in one leads to an increase in the other) and when the sign is negative, the relationship is indirectly proportional (a decrease in one variable causes the other variable to increase).

According to Table 4.10, it is clear that the analysed variables do not have any impact on one another. The output shows that no Pearson correlation value between variables is close to either +1 or -1 which are the two extremes. Variables are closest to 0 than the two extremes and thus as one variable changes it does not affect the

other. While that is the case, some variables have indicated significant correlation at either level 0.001 or 0.005. As shown in the table below, variables that were significantly correlated include gender and marital status, gender and household size, gender and access to irrigation water.

The results in Table 4.10 show that variables do not have any impact on one another. In this case, it is good to know that variables are not statistically correlated, it means that they each contribute differently towards food security. This further explains that variables' impact on food security status differ and one variable cannot be used to predict the value of the other.

Table 4.10: Bivariate correlations between explanatory variables.

| **Person's Correlations** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Gender | Age spread | Marital status | Education level | Employment status | Household size | Access to irrigation water |
| Gender | 1 | 0,130 | -.233** | -0,001 | -0,100 | .166* | .192** |
| Age spread | 0,130 | 1 | -.419** | -0,117 | 0,082 | 0,114 | 0,131 |
| Marital status | -.233** | -.419** | 1 | 0,060 | -0,039 | -0,119 | -0,046 |
| Education level | -0,001 | -0,117 | 0,060 | 1 | -0,111 | -.173* | -0,070 |
| Employment status | -0,100 | 0,082 | -0,039 | -0,111 | 1 | 0,013 | -0,098 |
| Household size | .166* | 0,114 | -0,119 | -.173* | 0,013 | 1 | .157* |
| Access to irrigation water | .192** | 0,131 | -0,046 | -0,070 | -0,098 | .157* | 1 |

Source: Generated from study results

### 4.5.2 Inferential statistical results.

Although criticised on the goodness of the model fit, Hosmer and Lemeshow Chi-square test is still regarded as a more robust test of the binary logistic regression model (Ngema et al., 2018). In this case, the value of 0.94 is greater than 0.05 and therefore signifies a good fit of a model to data. The pseudo-Nagelkerke of 0.47 is still low but closer to 0.5 which is indicative of a moderate fit of model to the data. The overall correct predictive power of the model was high at 86.5% which is indicative of how well the model fitted the data.

Table 4.11 shows that for every one-unit increase in female emerging farmers, the odds of household food security status decrease by 0.099 times. This means that the

odds of female farmer being food secure decrease by 90%. This was expected because females are more concerned about food preparation, processing, and preservation rather than food production (Abdulla et al., 2019).

The Table 4.11 also indicates that for every one-unit increase in young adult emerging farmers, the odds of household food security increase by 9.1 times while for middle adults it increases by 10.54 times. These results were expected and simply imply that as age increase, the chances of household food security also increase. Although there is no consensus as to the impact of age on the food security status of households; scholars like Mustapha et al. (2018) are of the view that with increasing age, farmers tend to be more food secure.

The output in Table 4.11 shows that there is a negative but significant relationship between emerging farmers who have been through secondary phase of studies and those who have completed matric. The relationship between the three variables (food security status, emerging farmers who have been through secondary schooling and those who have completed matric) is observed to be significant at 10%. Table 4.11 shows that for every one-unit increase in farmers who have been through secondary schooling and those who have matriculated, the odds of household food security status decrease by 0.084 and 0.037 times in a row. These results were not expected because an increasing education level is often associated with an increased chance of food security status. These findings are in contradiction with what was reported by both Ngema et al. (2018) and Zhou et al. (2019) indicating that there is a positive correlation between food security and education level of a farmer. Ngema et al. (2018) also mentioned that an educated farmer is in a better position to practice what he/she might have learnt in their farming school projects.

According to Table 4.11, households that are made up of three members have shown significance at 10% level while those made up of 5 members have shown significance at 5%. The same table further illustrates that for every one-unit increase in households with 3 members, the odds of household food security increase by 33.9 times whereas for the households with 5 members it increases by 44.2 times. These results were expected because households with few members are often associated with high odds of being food secure. In a study conducted in Ethiopia by Sisha (2020), it was reported that large family sizes are always associated with higher odds of being food –insecure.

Table 4.11: Determinants of household food security status of emerging farmers within Makhado Local Municipality

| **Variables in the Equation** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | B | S.E. | Wald | Df | Sig. | Exp(B) |
| Gender | Female | -2,310 | 0,735 | 9,876 | 1 | 0,002* | 0,099 |
| Age spread | Young adults | 2,218 | 1,152 | 3,708 | 1 | 0,054** | 9,192 |
| | Middle adults | 2,356 | 1,340 | 3,092 | 1 | 0,079*** | 10,549 |
| Marital status | Married | -1,420 | 1,609 | 0,778 | 1 | 0,378 | 0,242 |
| | Co-habiting | 0,393 | 0,809 | 0,236 | 1 | 0,627 | 1,481 |
| Level of education | Secondary level | -2,471 | 1,314 | 3,538 | 1 | 0,060*** | 0,084 |
| | Matric level | -3,304 | 1,745 | 3,587 | 1 | 0,058*** | 0,037 |
| Employment | Permanent employee | - 20,898 | 11178,033 | 0,000 | 1 | 0,999 | 0,000 |
| | Full time farmer | -1,598 | 20650,400 | 0,000 | 1 | 1,000 | 0,202 |
| Household size | 3 members | 3,526 | 1,876 | 3,530 | 1 | 0,060*** | 33,971 |
| | 5 members | 3,789 | 1,793 | 4,467 | 1 | 0,035** | 44,232 |
| Access to irrigation water | | 2,563 | 1,314 | 3,803 | 1 | 0,051** | 12,979 |
| 2 log likelihood | 98.0 | | | | | | |
| Cox and snell R square | 0.27 | | | | | | |
| Nagelkerke R square | 0.47 | | | | | | |
| LR Chi | 0.94 | | | | | | |
| Overall correct prediction | 86.5% | | | | | | |

Note: *significance at 1% level, **significance at 5% level, ***significance at 10% level.
Source: Generated from study results

Finally, Table 4.11 indicates with one-unit increase in access to irrigation water by emerging farmers, the odds of household food security increase by 12.9 times. The relationship between the two variables is observed to be significant at 5%. These results were expected because according to the literature, farmers with access to irrigation water have a better chance to produce products that matches the market standard and thus such products are marketable (Ngema et al., 2018). Marketable products generate good net income for a farmer and thus increase their chances of being food secure.

## 4.6 Discussion of findings

This study sought to analyse the contribution of emerging farmers towards food security within MLM. This was achieved by first studying the socio-economic characteristics of respondents and to do that, descriptive analysis was used. Net income generated from various farming practices was also determined in order to see the effectiveness of such income towards enhancing food security. Logistic regression model was applied to further study the correlation and significance of variables that were used to measure food security in the study.

The study found that majority (79.6%) of emerging farmers' households within Makhado Local Municipality were food insecure. This high rate of food insecurity amongst emerging farmers was highly influenced by the respondents' gender, education level, household size, and access to irrigation water.

According to the descriptive analysis results, it can be confirmed that farming within MLM is a male dominated space with 52.4% male emerging farmers. While this is the case, out of this 52.4%, 14.8% male farmers were able to generate income of at least R 624 per household member which is the food poverty line while females who managed to bit the food poverty line were only 5.6%. Logistic regression output has shown that there is a significant relationship between female headed households and food security status. According to these output; female headed households were observed to be more food insecure compared to households headed by their male counterparts. This was expected because females have been reported to be more concerned about keeping their households together rather than being out there in the fields (Zhou et al., 2019). These results are in consonance with what was reported by Aryal et al. (2019) indicating that female-headed households are more food insecure compared to male-headed households in Bhutan. These results can be attributed to a number of factors ranging from lack of farming skills by female emerging farmers to lack of sufficient time to work the fields as they spend most of their time ensuring that household chores are done, children are taken care of, and also attending to community events that require their involvement. Ashagidigbi et al. (2022) reported that women, particularly in Sub-Saharan Africa, are limited compared to their male counterparts in channels through which they can have easy access to productive inputs such as improved sees varieties and land inputs (Ashagidigbi et al.,2022). In

the same study, it was asserted that women are also limited in the level of participation in cooperatives to reduce access to markets with implication on their household food security status (Ashagidigbi et al., 2022).

The descriptive results on age show that both young adults (36-55 yrs.) and middle adults (56-65 yrs.) are food secure compare to the youth and elderly people. Almost 1 out of 9 (9.2%) young adults were reported to have been able to generate an income of R624 (proxy for food security) per person per month or more. This percentage was followed by 5.6% of middle adults who also reported to have been able to generate the same amount of R624 per person per month. As the age increase towards the elderly bracket, the level of food security amongst emerging farmers become even lesser reaching only 2.8% which is similar to that of the youth who are food secure. This can be attributed to the fact that at their age, young and middle adults have acquired enough experience to know what works and does not work in their farming practices. At this age, they are also capable of working the land themselves which makes farming effective for them. The results also show that there is a positive significant relationship between household food security status and respondents who are either young or middle adults. At this age, their farming methods have improved and majority of them still have access to internet where they can access current information which can help them enhance their farming skills which ultimately increase or improve their production rate. The elderly on the other hand are no longer strong enough to work the land which reduces their chances of being food secure. Scholars like Olounlade et al. (2020) together with Guo and Zhu (2015) believe that agricultural production is not benefitted by an increase in age of a farmer. They further asserted that the expertise and knowledge of an elderly farmer does not balance the negative limitations of their age which include the inability to adapt to new technology employed in farming which ultimately enhance production thereby improving food security of a farmer (Olounlade et al., 2020).

The small percentage (2.8%) of youth who are food secure can be as a result of them still finding what works best for them. Important to keep in mind is that in this study, the involvement of young people involved in farming was generally low (8.5%). A study conducted in Limpopo and Mpumalanga provinces, it was established that lack of access to credit and negative perceptions around farming are the leading reasons

most African young people have abandoned farming (Hlatshwayo et al., 2022). In the same study it was also reported that lack of employment opportunities in the rural areas has seen a lot of young people migrate to big cities in search of better opportunities (Hlatshwayo et al., 2022).

According to the descriptive analysis results, 20 or 18.1% of emerging farmers that were food secure indicated that they were married. These findings concur with what was reported in a study conducted in Maphumulong, Kwa-Zulu Natal, indicating that households that are headed by married people are alleged to do better off in terms of their food security status in relation to their unmarried counterparts (Ngema et al., 2018). The output from the regression analysis results were unexpected because ideally, joint attempts to provide for the food requirements of household should improve the chances of being food secure (Sekhampu, 2017).

Descriptive analysis results on education have shown that a total of 32.4% of all the respondents have been through secondary phase of study and out of them; only 4.9% were able to generate an income of R624 per person per month which proves that they were food secure. Binary regression output has shown a negative but significant relationship between food security status and education at secondary and matric levels. In a study conducted in Lesotho, it was established that educational level has no influence on the contribution of farmers to food security because the assumption is that people with higher levels of education are more likely to get higher paying jobs and be more food secure than relying on farm income as a source of primary income (income as a proxy for food security) (Muroyiwa and Ts'elisand, 2021). The same study also found that most of the farmers in Lesotho do not have any formal educational qualifications, they are able to produce vegetables for their family consumption and generate income by selling the surplus (Muroyiwa and Ts'elisand, 2021).

Results from descriptive analysis have shown that majority of all emerging farmers were full time farmers.

Regarding objective 2; the results have shown that the 4 commodities from which the highest mean annual net income per household was generated were cabbage, poultry, tomatoes, and cattle. Cabbage could have been able to sustain households that were

made up of 5 members. Referring back to Table 4.6 which focused on the household size of respondents, one can see that most of households were made up of 4-6 members at 44,7%. This means that if farmers were to rely on cabbage production in order to ensure food security; some households would have fallen off the 1-5 range which cabbage production would have catered for.

Table 4.6 also confirms that a total of 46.1% households which were made up of 7 and more people would have not been able to achieve food security through cabbage production alone. Cattle production would have been able to sustain households that are made up of only two members. According to Table 4.6 these members would not have even been 10% of the respondents because households that are made up of 1-3 members were sitting at 9.2% of the total respondents. Poultry farmers could have been able to generate a net income of R 624 per person per month for households that are made up of 4 members and 3 members for tomatoes emerging farmers. This means that all 9.2% of respondents whose households were made up of 1-3 members could have been able to be food secure throughout the year.

The results in Table 4.7 have proven that there is a high level of inequality amongst the production level of emerging farmers within MLM. This results are in concurrence with what was reported by Zantsi el al. (2019) in a study conducted in the Eastern Cape province where he reported that in the area of study; it was found that there was a big gap between the worst performing and best performing emerging farmer.

Both bivariate and binary logistic analysis indicated that access to irrigation water is positively and significantly correlated to food security status. Descriptive analysis results have shown that 79.6% of all respondents did not have access to irrigation water. Out of the 20.4% of emerging farmers who were food secure, 19.7% of them indicated that they had access to irrigation water. This was expected and these findings confirm what was reported by (Ngema et al.,2018). He had reported that irrigation infrastructure empowers farming households to adopt more diversified cropping patterns and to change from low value oriented products subsistence production which has the potential to boost productivity and thus household food security status.

Access to water, particularly for irrigation purposes, does not only depend on the availability of water sources or use rights but, also depends on the existence of certain infrastructure that enables water to be conveyed from the source to the site where it is needed (Chikozho et al., 2020). For instance, electricity to pump groundwater or operate irrigation equipment was cited as one of the major constraints by emerging farmers within MLM. Most of the farmers interviewed in the study sites indicated that the electricity tariffs charged are beyond their reach and this worsened their ability to access water. On the other hand, other farmers reported that they do not have electrical power supply in their farms and as a result they were propelled to buy generators which are also way too expensive to use as they need fuel.

Besides the issue of power supply, respondents also reported that they do not have irrigation equipment which means that although there can be water available for irrigation, they still would not be able use the water effectively due to lack of proper irrigation equipment. All together these factor impact on food security status negatively.

With effective irrigation equipment and access to irrigation water, emerging farmers can improve the quality of their products which would make their produces marketable so to generate good net income as a proxy for food security. Regarding the challenges that emerging farmers are faced with, farmers have indicated that their main challenge is the lack of access to markets and financial assistance. Table 4.8 has shown that 89.4% of respondents are negatively impacted by the lack of access to markets and financial assistance, 87.1% of emerging farmers are strongly concerned about the lack of farm inputs, and 81% is limited by lack of access to land and water rights which hampers production. Another 48% indicated some level of concern about the fact that majority of emerging farmers within MLM are focusing on the production of similar commodities, and this made it difficult to market or sell most of their products.

# Chapter 5: Summary, Conclusion, and Recommendations

## 5.1 Summary

This study found that Makhado Local Municipality's emerging farmer sector is a male dominated sector with more than half (54.2%) male representative and 45.8% females. Almost 9 (94.4%) in every 10 respondents admitted that they were full time farmers. Out of 54.2% male farmers, 14.8% managed to generate an income (income as proxy for food security) equal or more than R624 which is the food poverty line and this confirmed that they were food secure. Female farmers made up 5.6% of the 20.4% of respondents who were food secure. Important to note is that almost three quarters (73.1%) of these emerging farmers are married while the remaining are either single or cohabiting.

The study also established that, almost half (47.9%) of all respondents have been through either primary or secondary phase of their studies. Impressing to know is that 44.3% of emerging farmers within MLM have either matriculated or hold qualifications that are above matric level. Respondents who hold matric and those who attained education qualifications higher than matric dominated the food secure households by 13.3% out of 20.4%. Most of the respondents who made up the 13.3% of the food secure household were farmers who had matriculated at 7%.

The study further established that, most (38.7%) of respondents were middle adults (56-65 yrs.) with only 8.5% youth (18-35 yrs.). The age group that saw a high level of food security was the young adults at 9.2% out of 20.4%. Most of the households that were found to be food secure had between 4 and 6 household members followed by households with 7-9 members at 4.3%. All 20.4% respondents who reported to be food secure had access to irrigation water while the remaining 79.6% did not have access to irrigation water.

According to the binary regression output, variables that showed significance in the determination of the respondent's food security status were female gender, age (young and middle adults), education level (secondary and matric), household size (3 and 5 members), and respondent's access to irrigation water.

All respondents confirmed that they grow maize. Out of 182 respondents; only 31 of them indicated that they are able to generate income from maize production. The four top products that generated most annual net income per household were cabbage, poultry, tomatoes, and cattle which generated annual averages of R38 141.74, R33 320.58, R20 300.37, and R15 321.43 consecutively.

Among the six challenges that were identified by the researcher; the three most prevalent were lack of markets and financial assistance (89.4%), access to farm inputs (87.1%), land and water rights at 81%. Climate change was also identified by 76.6% of respondents as a challenge and hindrance to food security. The other three challenges that were identified by respondents included the production of similar products (48%), lack of timeous tractor services (28.6%), and insufficient irrigation equipment (18.9%).

The results presented in this study have shown that food security remains an issue of concern for emerging farmers that are located in MLM. The descriptive results have confirmed that majority (79.6%) of emerging farmers were food insecure. This means that almost 8 out of every 10 emerging farmers that are located in Makhado Local Municipality are unable to generate a net income that is or above the food poverty line of R624.

## 5.2 Conclusion

This study hypothesized that the level of education attained will impact on the level of farm income (proxy for food security). This hypothesis is accepted, especially in that attainment of both secondary and matric education levels had significant negative impacts on food security at 1% and 5% levels of significant respectively. Other socio economic characteristics that impacted on food security were female gender (negative impact at 1% level of significance), young and middle adult farmer (positive impact at 5% and 10% levels respectively), household sizes of three and five members (positive significance at 10% and 5% level respectfully), and access to irrigation water by the respondent (significant at 5% level).

This study also hypothesised that crop farmers generated more farm net income (as proxy for food security) compared to livestock farmers. This hypothesis is accepted because according to Table 4.7, most of the farmers participated in crop farming rather

than livestock farming with the highest average annual net income of R38 141.74 per household for cabbage production. The latter was followed by poultry farming with an average net income of R33 320.58 per household. Tomatoes generated a net average income of R20 300.37 per household which is also more than the average generated from cattle farming at R15 321.43.

Lastly, the study presumed that lack of infrastructure is the greatest challenge that emerging farmers within MLM are faced with. Given the descriptive analysis results that were run on challenges that farmers are faced with, this hypothesis was accepted. Out of all respondents, 57.3% agreed that lack of infrastructure was one of the greatest challenges they are faced with. However, it was also shown that almost 89.4% of respondents were negatively impacted by the lack of markets and financial assistance. Also, about three quarters (75%) of respondents agreed that lack of farm inputs, lack of land and water rights, and climate change have had a negative impact on their production. Other challenges that were identified by the farmers included production of similar products and lack of tractor services.

## 5.3 Recommendations

The objective of this study was to assess the contribution of emerging farmers towards food security in MLM. Recommendations that were drawn from this study are indicated below:

Important to note from the study results is the fact that there is a very low (8.5%) involvement of young people in farming. Given that young people are the future holders, it is imperative to find ways that can encourage them to take advantage of opportunities in farming. Workshops and youth empowerment programmes can be put in place for exposure into farming opportunities. In order for this to be achieved, already established farmers can accommodate youth that are interested in farming.

Given these findings; it is imperative for Limpopo Department of Agriculture and Rural Development to forge a strong relationship with the local authorities such chiefs and councillors who have a close access to emerging farmers. This has a great potential to make the farming events a success and thus empowering more farmers. To add on that; Limpopo Department of Agriculture need to establish a skills exchange platform which affords emerging farmers an opportunity to go and learn from the already

commercialised farmers. On the same note; it is the responsibility of national department of Agriculture, Land Reform, and Rural Development together with its distinct provincial and district offices to mobilise, train, and support land reform beneficiaries to access land and use it in a beneficial manner.

Relating to policy; it is imperative that the department of Agriculture, Land Reform, and Rural Development develops policy cohesion and coordination that will ultimately lead to adequate progress towards national and international development targets of food security.

Secondly, given that majority of farmers have been unable to generate enough income from their different farming practices, it is necessary that farmers also explore other means of generating income that can subsequently enhance their food security besides focusing on farming. These opportunities can range from starting other small sustainable businesses to going back to school. Young people and middle adults who are unable to generate enough income from their farm activities can still go back to school in order to acquire the skills that are required for them to be employable. In this way; farm income can be used as secondary income rather than a primary source of income.

Thirdly, the problem with markets need to be addressed by the market owners and influential consumers. Both big and small markets need to reach out to famers and inform them about their expectations such as the type of products they need and the standard of such products. The latter will assist farmers to remain relevant throughout their production processes and will also help them produce marketable products. Emerging farmers may also want to venture into contract farming so that they can avoid loss and maximise production which will ultimately have a positive impact on the net income they generate.

Lastly, with so many emerging farmers located in MLM; it will be wise for them to form farmers' groups. Group formation has the potential to enhance net income (net income as proxy for food security) given that emerging farmers can take advantage of an opportunity to work together, share skills, and empower one another. This will also afford the best performing farmers an opportunity to empower those that have not been doing well in the farming sector. From the results of this study, it would be best

for emerging farmers to invest more in the production or farming of commodities such as cabbage, poultry, tomatoes, and cattle.

## 5.4 Issues for further investigation

As previously reported; this study has found that there is a big gap of inequality between the best and worst performing farmers within MLM. The researcher will seek to find factors that contribute towards such inequalities. Due to an increased number of respondents who indicated that they do not have access to irrigation water which has a negative impact on their production; it will be necessary to find ways in which emerging farmers can easily access irrigation. This study established that out of the seven variables that were analysed; five of them were found to have had a significant impact on the net income generated by emerging farmers. It will therefore be necessary to further study how these five significant variables can be used to improve the strategic interventions that are put in place in order to assist emerging farmers generate income that can enhance their food security.

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