



**SMALLHOLDER FARMERS' PERCEPTIONS OF DROUGHT TOLERANT MAIZE
CROP IN CORK VILLAGE IN MPUMALANGA PROVINCE**

By

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Development Studies to be awarded at the Nelson Mandela University

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ABSTRACT

The study explored smallholder farmers' perceptions of drought tolerant maize in Cork village, Mpumalanga Province. The study analysed the factors that pushed smallholder farmers to grow drought tolerant maize crops. It examined the maize varieties farmers grow and investigated the benefits and the challenges of growing drought tolerant maize crops. The review of literature found that no similar studies have explored the smallholder farmer's perceptions of drought tolerant maize. The study was guided by a pragmatic research philosophy and it used mixed research methodology to collect data on the research objectives of the study. Purposive sampling was used to select primary respondents and snowball sampling was used to select key informants. The study found that drought and agro-ecological conditions have pushed farmers to grow drought tolerant maize crops and these crops are improving farmer's agricultural yields and food security. However, drought tolerant maize crop varieties are inaccessible at shops and they are very expensive to buy given the socio-economic status of people living in rural areas of this village. The study recommends that the price of drought tolerant maize seed varieties should be subsidised, availability and easily accessibility to the market should be improved and future studies could investigate the contribution of drought tolerant maize varieties on household food security.

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LIST OF ACRONYMS

ARC	Agricultural Research Council
ACSD	Africa Committee on Sustainable Development
CIMMYT	International Maize and Wheat Improvement Centre
DARDLEA	Department of Agriculture, Rural development, Land and Environmental Affairs
DAFF	Department of Agriculture Forestry and Fisheries
DKC	<i>DeKalb</i>
DTM	Drought Tolerant Maize
IITA	International institute of Tropical Agriculture
LAFDAM	Latin American and Caribbean Flood and Drought Monitor
NGO	Non-Governmental Organisation
OPV	Open pollinated varieties
SA	South Africa
SAGL	South African grain laboratory
UNISDR	United Nations international strategy for disaster reduction
WEMA	Water Efficient Maize of Africa

CHAPTER 1

INTRODUCTION

1.0 Introduction and Background to the Study

Maize is a staple crop in South Africa. It contributes to the socio-economic wellbeing of the country, especially to the uplifting of the welfare and livelihoods of smallholder farmers in the rural areas. Maize farming makes a significant contribution to food security, rural development, job creation and poverty reduction (FAO, 2014). Maize has been estimated to contribute at least R10.2 billion to the South African annual Gross Domestic Product (Department of Agriculture Forestry and Fisheries (DAFF), 2016).

Mpumalanga is one of the major maize-producing provinces in South Africa, producing an average of 20% of maize output for the country (Department of Agriculture Forestry and Fisheries (DAFF), 2016). Farming in this province is done by commercial farmers and smallholder farmers who are mainly practicing subsistence farming. However, the region is being affected by weather variability; the region is experiencing high temperature variability and erratic summer rains which are threatening agricultural production in this region.

Consequently, most of the output is produced by commercial farmers because the smallholder farmers cannot be productive with the variability of high temperatures and rainfall because they depend on agriculture for food security (Department of Agriculture Forestry and Fisheries (DAFF), 2016). These variations in temperature and rainfall are unsuitable for agriculture in which most smallholder farmers produce maize under dryland. Sokona and Denton (2001) describe smallholder farmers as being among the most highly vulnerable and having low adaptive capacity in the face of climate change. Easterling *et al.* (2007) argue that smallholder farmers suffer the most from the effects of climate change. These threats are worsened by the fact that South Africa is a water stressed country and is high drought prone nation (Mosase, Ahiablame & Srinivasan, 2019).

Several researchers have established that climate change is a major threat to the welfare of smallholder farmers, and it directly impacts negatively on food security (Sokona and Denton, 2011; Tambo and Abdoulaye, 2013). Droughts make smallholder farming a risk venture as they lead to crop failure, hunger and poverty among smallholder farmers. Maize is highly sensitive to drought stress. The development of drought-tolerant maize varieties is one of the ways to mitigate the threats of drought and heat stress on maize yields. Drought tolerant maize varieties were developed to improve food security by ensuring that farmers harvest a substantial yield even after the maize crop has undergone drought stress (Tambo and Abdoulaye, 2012). Moreover, the Department of Agriculture Forest and Fisheries (2015) indicated that drought tolerant maize is in line with the development objectives of the South African government to give primary focus to smallholder farmers on food security and sustainable livelihoods, to grow the economy of the country.

Despite the benefits of drought tolerant maize varieties and the adoption rate of maize varieties by smallholder farmers, there is little focus among academic scholars to understand the perception of drought tolerant maize farming practices and the contribution of drought tolerant maize to household food security (Barbier, Yacouba, Karambiri, Zorome, M. & Some, 2009; Below, Mutabazi, Kirschke, Franke, Sieber, Siebert & Tscherning, 2012; Bryan, Deressa, Gbetibouo & Ringler, 2009; Deressa, Hassan & Ringler, 2009; Fosu Mensah, Vlek & MacCarthy, 2012 Gbetibouo 2009; Kemausuor, Dwamena, Bart-Plange & Kyei-Baffour, 2011; Mertz, Mbow, Reenberg & Diouf , 2009; Speranza, Kiteme, Ambenje, Wiesmann & Makali, 2010). Therefore, understanding the perceptions of the smallholder farmers is key in designing developmental policies to improve food security and reduce poverty.

1.1 Problem Statement

Smallholder farmers have been identified as the most vulnerable group to the effects of drought. There is an increase in the frequency of drought in South Africa and farmers have been experiencing a massive decline in maize yield. Through government and non-governmental organisation (NGO) initiatives, smallholder farmers have been encouraged to grow drought tolerant maize varieties and these crops have contributed immensely to improving household food security in the rural economy of South Africa. However, very few studies have been conducted to understand farmers' perceptions to drought tolerant maize and their contribution to household food security.

1.2 Aim of the Study

The main objective of this study is to understand the perceptions of smallholder farmers using drought tolerant maize in the drought prone region of Mpumalanga to improve household food security.

1.3 Specific Objective

- To determine factors that pushed small scale farmers to grow drought tolerant maize.
- To identify drought tolerant maize varieties grown by smallholder farmers in Cork Village.
- To identify the perceived benefits of growing drought tolerant maize to increase food access.
- To determine the challenges that smallholder farmers are facing when growing drought tolerant maize.

1.4 Research Questions

This study was guided by the following research questions;

- What pushed smallholder farmers to grow drought tolerant maize?
- What are the drought tolerant maize varieties grown by smallholder farmers in Cork village?
- What are the benefits of growing drought tolerant maize?
- What are the challenges smallholder farmers face when growing drought tolerant maize?

1.5 Significance of the Study

The study is undertaken to influence the formulation of policies that are responsive to the needs of subsistence farmers through carrying out research on the experiences of smallholder farmers who are growing drought tolerant crops. This strengthens the role of smallholder farmers in maintaining and promoting household food security. Also, the study is undertaken to provide academic knowledge on drought tolerant maize. This information is vital for mobilisation of resources so as to address the challenges that smallholder farmers are facing when growing drought tolerant maize.

1.6 Research Assumptions

The researcher assumes that growing drought tolerant maize increases household food availability;

The researcher assumes that growing drought tolerant maize increases household income;

The researcher assumes that growing drought tolerant maize increases household access to food; and

The researcher assumes that growing drought tolerant maize increases household food stability.

1.7 Scope and Scale of the Study

The study was carried out in Cork village, which is found in ward 23 of Bohlabela District and the village is under the administration of Bushbuckridge local municipality. The study explored the perceptions of smallholder farmers about drought tolerant maize crop varieties. The study only targeted smallholder farmers in Cork village as primary respondents for the study.

1.8 Outline of the Study

Chapter one discusses the background of the study. It outlines the aim and the objectives of the study and the scope of the study. Chapter two reviews literature on drought tolerant maize crops. Chapter three discusses the research methodology of the study. Chapter 4 presents the research methodology of the study. Chapter 5 discusses the research findings of the study and concludes the study as well as outlining the recommendations of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents the knowledge gap of the study by demonstrating the main reasons that pushed the principal investigator to evaluate the perceptions of smallholder farmers on drought tolerant maize. This chapter defines the term drought and drought tolerant maize and discusses literature around these terms. It explores the effects of drought on maize production in Africa.

2.2 Knowledge Gap of the Study

Multiple studies have been conducted on drought tolerant maize crops. Most of the studies have explored the impact of drought on drought tolerant maize crops. Others have investigated the impact of drought tolerant maize varieties on productivity, risk and resources use (Simtowe *et al.*, 2019). Moreover, some studies have examined the adaptive capacity of drought tolerant maize crops to extreme weather events. More so, other studies have examined the adaptive strategies to drought stress (Wossen *et al.*, 2017). However, there are limited research studies that have attempted to explore the perceptions of smallholder farmers on growing drought tolerant maize.

2.3 Drought Tolerant Maize

Drought tolerant maize varieties are crops that can withstand moderate drought and heat stress without substantial yield losses (Lunduka *et al.*, 2017 and Tambo & Abdoulaye, 2013). Magorokosho, Vivek and MacRobert (2009) define the drought tolerant maize variety as crops that can produce approximately 30% of its potential yield after suffering water stress for six weeks before and during flowering and grain-filling. The International Maize and Wheat Improvement Centre (CIMMYT, 2006) indicates that research has

proved that drought tolerant maize varieties are not only drought tolerance but also high yielding. Since 2006, more than 100 new drought-tolerant maize varieties and hybrids have been developed and released across 13 countries by the International Maize and Wheat Improvement Centre initiative. On-farm trials found that new varieties have yielded up to 35% more grain than those grown previously by farmers and more than 2 million smallholder farmers in sub-Saharan Africa are now growing these new varieties and hybrids (Katengeza, Holden & Lunduka, 2018).

2.4 Drought

Drought is described as a natural reduction in the amount of precipitation received over an extended period of time and it is associated with other climate factors such as high temperatures, high winds, and low relative humidity that can significantly aggravate the severity of the event (Wilhite *et al.*, 2005). Droughts are a natural hazard and a threat to people's livelihoods and they pose serious threats which can result in significant economic, social and environmental costs (UNISDR, 2009; Vogt & Somma, 2000). Drought can result in scarcity of water which causes exhaustion of soil moisture, depletion of underground water supply and reduction of stream flow (Rathore, 2005) as well as biotic loss and crop failure (Huho *et al.*, 2010) and degradation of arid regions (Kundzewicz, 1997; Panu & Sharma, 2002).

Drought can be categorised into four types; namely meteorological, agricultural, hydrological drought and socio-economic drought (Wilhite *et al.*, 2000). Meteorological drought is defined as a prolonged and abnormal moisture deficiency (Palmer, 1965). Hydrological drought is described as a reduction in groundwater levels, stream flow, and lake and reservoir storage. (Agnew & Anderson, 1992; Maliva & Missimer, 2012). Agricultural drought is defined as a deficit in soil moisture, driven by meteorological and hydrological drought, reducing the supply of moisture for vegetation. Socio-economic drought is described as a combination of the above three types, leading to undesirable social and economic impacts (Latin American and Caribbean Flood and Drought Monitor, 2014).

2.5 Droughts and their Impact on Maize Production in Africa

In Africa maize is a major staple crop cultivated and consumed by almost all households and its availability ensures food security and economic wellbeing. Approximately a quarter of a billion Africans depend on maize as their staple food and the crop can be used for food and non-food products (International institute of Tropical Agriculture (IITA), 2021). This crop accounts for 30-50% of low- income household expenditures and at least 30% of the total area is under cereal production. However, the production of this crop is under serious threat due to frequent and severe droughts (IITA, 2021). Drought has remained the worst climate-related disaster threatening maize production. Maize crops are highly susceptible to drought. According to (Fisher *et al.*, 2015) around 40% of Africa's maize-growing areas face occasional drought stress, resulting in yield losses of 10–25%.

World Bank (1998) argues that extreme vulnerability to rainfall in the arid and semi-arid regions and poor capacity of most African soils to retain moisture has resulted in almost 60% of African maize growers being vulnerable to droughts and 30% being extremely vulnerable. Since 1960 rainfall in the parts of Sahel region and Southern Africa has been below normal compared to the previous years. Most important drought intervals in Southern Africa include 1982–1984, 1991–1992, 1994–1995 and 2015–2016 (Weather SA, 2018). Droughts have resulted in land degradation and climate scenarios have projected that 5% to 8% of arid and semi-arid regions are expected to expand (Huang *et al.*, 2015).

Global warming is expected to increase the occurrence of droughts and Bristol University has indicated that areas in Western Africa are likely to experience extreme droughts (Masih *et al.*, 2014). More so, predictions of the Bristol study found that the driest regions in Africa will become drier signalling a risk of persistent droughts which will therefore affect maize production (Masih *et al.*, 2014). With the abovementioned occurrences of droughts, the yields of maize have been negatively affected across Africa (Huang *et al.*, 2012; Ji *et al.*, 2014; Niang *et al.*, 2014).

Maize yields in Sub Sahara Africa have stagnated at less than two tonne per hectare and less than 1.5 tonne per hectare in Western and Southern Africa (Cairns *et al.*, 2013). In Sub Sahara Africa from 1961 to the year 2010, West Africa was the highest maize producer when South Africa was excluded, and Southern Africa ranked lowest (Smale *et al.*, 2011). Generally, there is an observed 10% decline in maize yield and rain-fed agriculture could be reduced by up to 50% by droughts, which would affect food security and worsen the malnutrition situation (IPCC, 2007).

Daryanto, Wang and Jacinthe (2016) estimate that the occurrence of mid-season droughts, particularly at the vegetative and productive phases for maize, reduces yields by 39.3%. In the Sub-Saharan region, 90% of the maize is grown under rain fed conditions and due to changes in climatic conditions the maize yield reduction is predicted to decline by 5%-10% by 2050 in nearly three quarters of African countries (Jones and Thornton, 2003). Mulungu and Ng'ombe (2019) found that maize yield in Zambia is under the worst-case scenario and will decrease by 25% mainly driven by droughts.

2.6 The Impact of drought on Maize Production in South Africa

Maize production is critical to South Africa's economy for food, employment and the generation of foreign currency as it contributes approximately 46.2% of the gross value to the country (Department of Agriculture Forest and Fisheries, 2020). Maize in South Africa is grown by commercial farmers and smallholder farmers and these sectors experience drought risks differently. In South Africa, drought affects agricultural production and food security and droughts in this country area are recurring, with spatial and temporal characteristics that vary significantly from one region to another.

South Africa is prone to recurrent droughts due to its long-term unpredictable annual rainfall and drought in this region is defined as any period where the annual average rainfall is below 600 mm (Akpalu, 2005). South Africa, due to the unpredictability, goes through periods where there is rainfall above the normal and periods where it receives below-normal average rainfall. In a non-drought year, South Africa is self-sufficient in its

maize production, and it exports excess maize to countries such as Zimbabwe, Botswana and Malawi.

Between 1970 and 2017 South Africa recorded a total of twenty years of below normal average rainfall. These droughts were caused by La Nina and El Nino climatic events. From 2000 to 2017 droughts were recurrent and in 2015 South Africa received its lowest annual rainfall of 403mm since 1904; making it the worst drought as it was even worse than the 1991 to 1992 drought periods (AgriSA, 2016; Moobi, 2019). In 2015 the Free State province was declared a drought disaster province. Because of droughts the area planted for maize has reduced to 2 million hectares from 5 million hectares and this reduction was 25% lower than the area planted during the 1970s Crop Estimate Committee, (CEC, 2015/2016). Between the 2015 and 2017 agricultural seasons, South Africa (SA) moved from being a net exporter of maize production to a net importer of maize and during this period SA required 3.8 million tonne of maize to prevent food insecurity in the country (Grain South Africa, 2018).

2.7 Summary

This chapter presented the knowledge gap of the study by demonstrating the main background which pushed the principal investigator to investigate the perceptions of smallholder farmers of drought tolerant maize. Moreover, this background identified the knowledge gap on this topic. The chapter also defined the term drought and drought tolerant maize and it discussed literature around these terms. It reviewed the effects of drought on maize production in Africa, it explored the effects of droughts on maize production in South Africa.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology of the study. It discusses the research philosophy adopted for the study, research design followed by the principal investigator, as well as research instruments that were used to collect data. The study justifies the target population selected for the study and it provides a brief description of the study. This chapter also explains the steps that were undertaken to ensure the validity and reliability of the study and finally it discusses the ethical considerations that will be followed.

3.2 Research Philosophy

This study adopted a pragmatic research philosophy. The pragmatic philosophy allows the researcher to use the best methods that assist in answering the research problem of the study (Feilzer, 2010). It allows the researcher to use any of the methods, techniques and procedures typically associated with quantitative or qualitative research. It recognises that every method has its limitations and that the different approaches can be complementary (Kelly & Cordeiro, 2020; Tashakkori, & Creswell, 2007; Feilzer, 2010) Hence, this study used focus group discussions, questionnaire surveys, telephone interviews and key informant interviews to answer the research objectives of the study.

3.3 Research Design

The study used mixed methods research. It allows the researcher to collect and analyse data, integrate the findings and draw inferences using both qualitative and quantitative approaches and methods in a single study (Tashakkori & Creswell, 2007). The principal researcher is not restricted by the use of traditional approaches to data collection but is guided by a foundation of enquiry that underlies the research activity (Creswell, 1994). It

includes qualitative and quantitative dimensions, but difficulties often arise when the researcher attempts to articulate how the two elements relate to one another (Tashakkori & Creswell, 2007). In this study the researcher is mixing a questionnaire survey with focus group discussions and key informant interviews.

3.4 Research Procedure

The researcher first sought permission from the District Director at Mpumalanga Provincial Department of Agriculture and local headman to conduct the study and this was achieved by fully explaining the main purpose of conducting the study in their district. After obtaining permission to conduct the study in Cork Village, the researcher organised meetings with the help of the village headman and the main purpose of this meeting was to explain the purpose of the study to the villagers; thus the researcher successfully obtained permission to conduct the study.

After obtaining permission to conduct the study with community farmers, the researcher was helped by the village headman to select the participants purposively and she then organised meeting dates for focus group discussions. The researcher first conducted focus group discussions to collect data on the perceptions of smallholder farmers on drought tolerant maize crops. Secondly the researcher conducted key informant interviews with community leaders, the headman and agricultural advisors on the benefits and challenges of growing drought tolerant maize crop. Lastly the researcher, gathered, analysed and presented the information obtained from the fieldwork in the form of master's thesis.

3.5 Description of Study Area

Cork Village is found in Bushbuckridge Municipality in Mpumalanga province in the Northern part of South Africa. According to South African grain Laboratories (SAGL) (2006), Mpumalanga is the province that produces the second biggest harvest of maize

commercially in South Africa (see Figure 3.3) and it is also experiencing the effects of drought; hence the need to investigate the perceptions of smallholder farmers of drought tolerant maize. The village is in a semi-arid region and is prone to severe droughts which can result in significant rainfall shortages and drought variability (Fauchereau *et al.*, 2003).

Rainfall in this area is very low and the mean annual rainfall is approximately 550 mm to 600 mm (see Figure 3.2) which is received between October and April, usually in the form of convectional thunderstorms (Akpalu, 2005). Temperatures during the dry seasons are high and the mean annual temperature is approximately 22°C (Akpalu, 2005). The village experiences prolonged dry spells in weather conditions which affect crop and livestock production. People in this area depend on rain-fed agriculture to grow crops and they practice mixed farming as their main sources of livelihood. The following is a map of Cork Village.

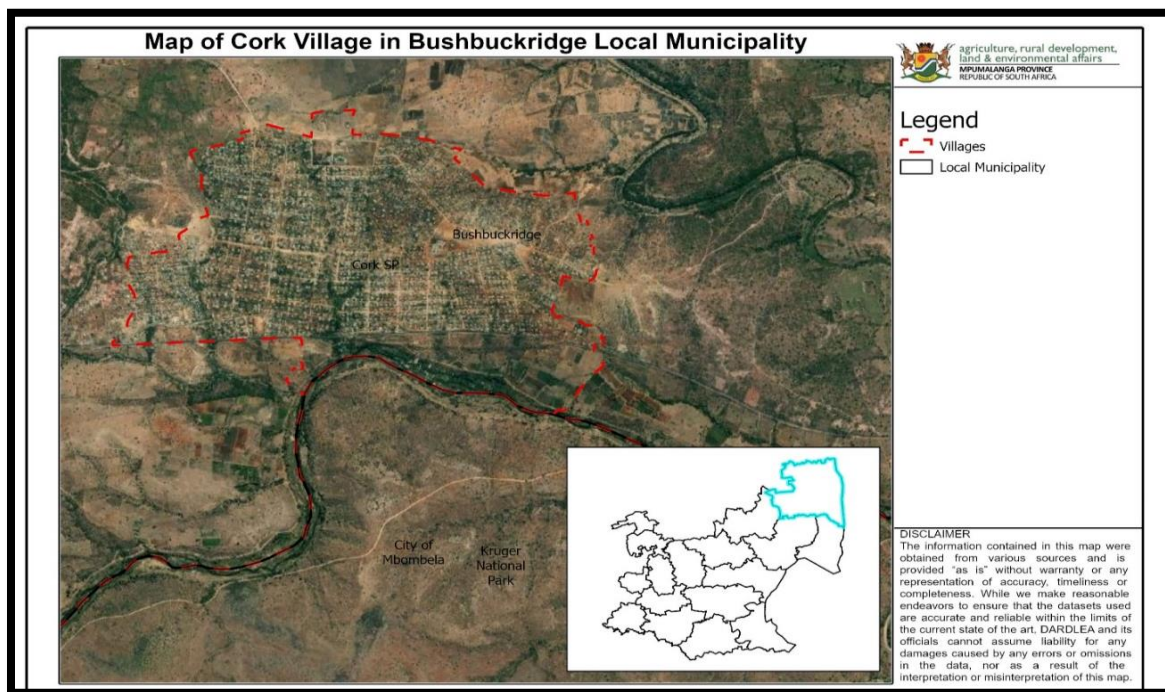


Figure: 3.1: Map of Cork Village

Source: DARDLEA (2021)

The following is a graph showing the average rainfall pattern of Bushbuckridge (World Weather Online, 2021).

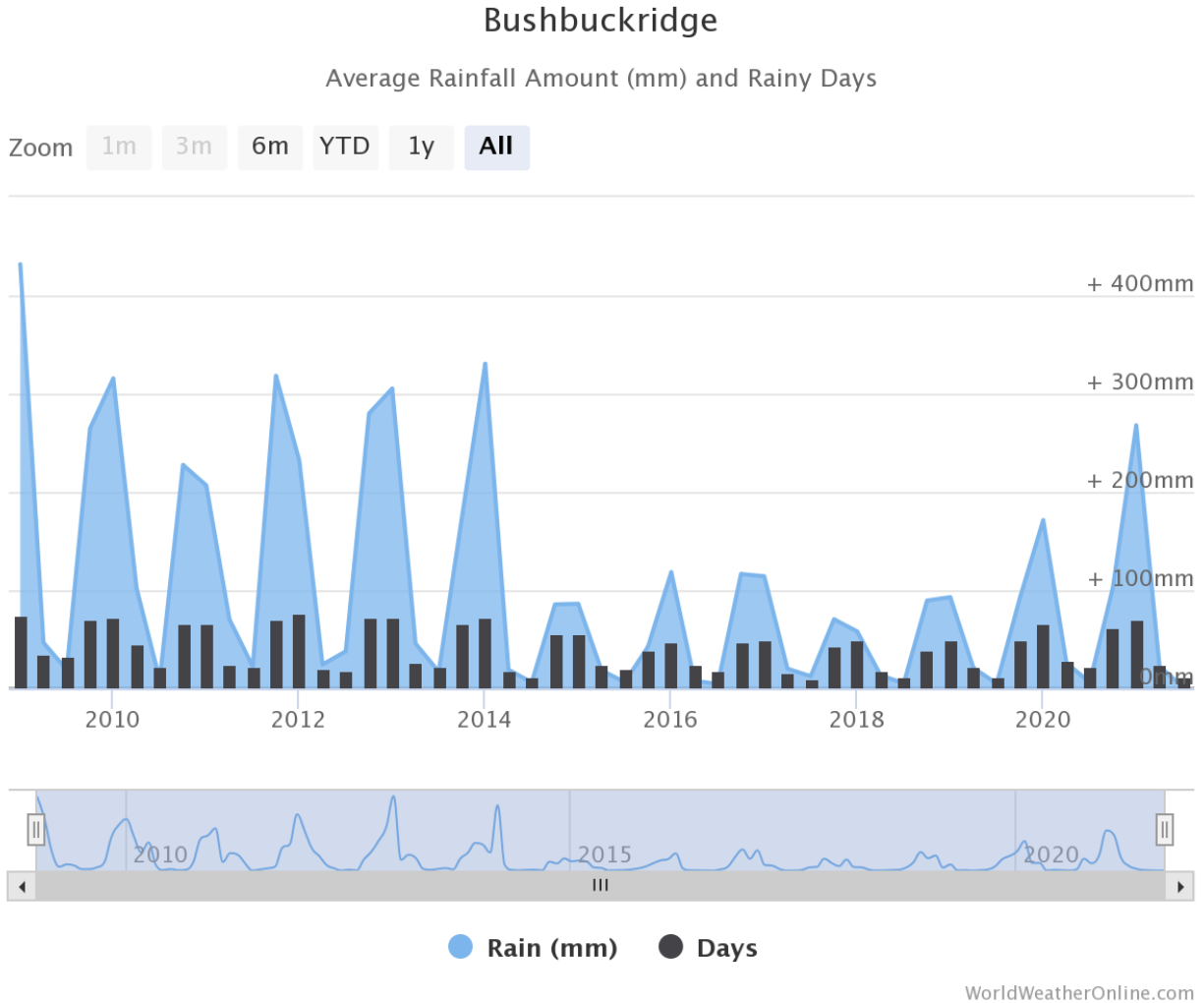


Figure: 3.2: Average Rainfall Pattern of Bushbuckridge

Source: Worldweatheronline (2021)

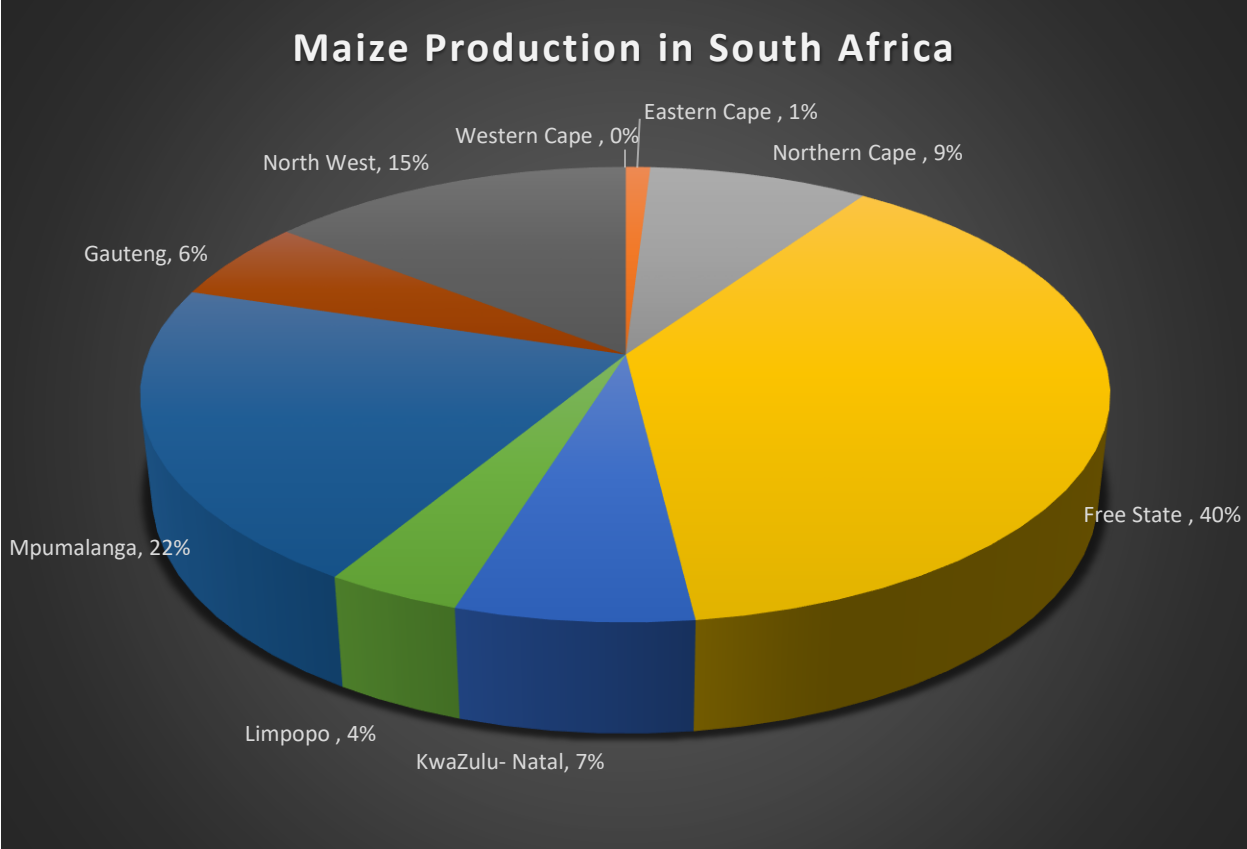


Figure 3.3: Maize Production in South Africa

Source: DAFF (2016) & Galal (2021:1)

3.5 Target Population and Sample size

The target population group were smallholder farmers who grew drought tolerant maize in Cork village. The study interviewed 50 participants; 30 were women and 20 were men. The study interviewed more women than men because men focused more non agrarian livelihoods that generate household income. The researcher selected a small sample size of 50 people because it required little effort to manage and resources during the administration of various data gathering instruments.

3.6 Purposive Sampling

The researcher used a purposive sampling technique to select farmers in Cork village. The researcher was helped by the village headman to select the respondents. Purposive sampling technique is a non-probability sampling that allows the researcher to use his or her own judgment when choosing members of the population to participate in the study (Palinkas *et al.*, 2015). The researcher used this method because it is cost effective, and it saves time when selecting respondents. It is believed that this method is appropriate when there is a limited number of respondents who can contribute to the study. However, it is believed that this method is more prone to errors in judgement by the researcher and it is difficult to generalise findings from a purposive sampling technique (Omona, 2013).

3.7 Snowball Sampling

Snowball sampling was used because the researcher did not know her key informants. The researcher first met the district director who then directed the researcher to other key informants and each key informant referred the researcher to other key informants. Snowball sampling is a non-random sampling method that uses a few cases to help encourage other cases to take part in the study, thereby increasing sample size. The researcher used a snowball sampling technique because referrals make it easy and quick to find subjects as they come from reliable sources. An additional task is saved for the researcher and this time can be used in conducting the study. This method is cost effective as the referrals are obtained from a primary data source.

3.8 Data Collection Tools

The researcher used methodological triangulation to collect data from the respondents. Therefore, the researcher used a questionnaire survey, focus group discussion, key informant interviews and telephone interviews.

3.9 Questionnaire Survey

The researcher used a questionnaire to capture data on biographical characteristics of the respondents and the perceptions of farmers of growing drought tolerant maize crops in Cork Village. A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. Questionnaire surveys were used because they are cheap, and they do not require much effort as they often have standardised answers that make it simple to compile data. Large amounts of information can be collected from a large number of people in a short period. The survey can be carried out by the researcher or by any number of people with a limited effect on its validity and reliability. The results of the questionnaires are easy to quantify by either a researcher or through the use of a software package (Mathers *et al.*, 2007).

3.10 Focus Group Discussion

Focus group discussions were used for the purpose of clarification based on the responses of the participants from a questionnaire survey. Focus group discussions were conducted with a group of 10 to 15 participants and they lasted for an hour. Focus group discussions were used because they provided an opportunity to expand the analysis which an individual holds with other group members and they are open, interactive and participants feel free to express their ideas and opinions. Focus group discussions were used because they reveal shared understandings or common views. More so, focus group discussions allowed the researcher to ask for clarification on research findings which were not clear. However, focus group discussions are prone to group think, and in this case, were dominated by two people who provided responses to questions presented to the group by the researcher. More so, the focus group discussions were time consuming to conduct and can be difficult and time consuming to analyse.

3.11 Key Informant Interviews and Telephone Interviews

Key informant interviews were used to collect information from the district officials and traditional leaders. Key informant interviews were used because they provided information directly from knowledgeable people. More so, key informant interviews helped the researcher to obtain new information, providing unpublished documents to support findings that were obtained from the farmers in the village. In addition to this, key informant interviews are inexpensive and simple to conduct. However, they are more prone to bias if informants are not carefully selected, and they are susceptible to interviewer bias. However due to the outbreak of the Corona virus and lockdown restrictions, the researcher used telephone interviews to collect data from the key informants to protect the respondents contracting COVID-19. The researcher was helped by the District Director and Agricultural Extension Officers to get contact numbers of key informants for telephone interview sessions.

3.12 Data Analysis Procedure

The data analysis procedure was divided into four steps which included: 1) The gathering of field notes; 2) Data Analysis; 3) Repeating data analysis; and 4) presentation of findings.

- 1) Gathering notes from fieldwork: The researcher first gathered all field notes from the focus group discussions, key informant interviews, and questionnaire surveys in preparation for data analysis.
- 2) Data Analysis: The researcher analysed data obtained from all data collection notes and identified themes in line with the research objectives of the study. The researcher first analysed information obtained from the questionnaire survey and then reviewed information obtained from focus group discussions and integrated information obtained from both data collection tools identifying recurring themes. Lastly, the researcher reviewed field notes from key informant interviews and integrated this information with recurring themes obtained from the farmers.

- 3) Repeating the data analysis process: The researcher repeated the data analysis procedure to cross-check missed information that can be added to emerging themes of the study.
- 4) Presentation of data: The researcher presented findings in the form of a master's thesis.

3.13 Ethical Considerations

According to Resnik (2011), ethics distinguish between what is right and wrong when conducting research. In this study, the researcher adhered to ethical considerations in order to protect the rights of the participants in the research. The researcher obtained informed consent from the District Director to conduct the study in Cork Village. The researcher also obtained permission to conduct the study from the chiefs and the villagers after fully explaining the purpose of conducting research. The researcher respected the respondents' right to withdraw from participating in the study and protected the privacy as well as the confidentiality of the respondents and data available.

3.14 Summary of the Chapter

This chapter discussed the research methodology of the study. It discussed the research philosophy adopted for the study, research design followed by the principal investigator, and research instruments that were used to collect data. The chapter justified the target population selected for the study and it provided a brief description of the study. This chapter also explained the steps that were undertaken to ensure validity and reliability of the study and this chapters discussed the ethical considerations that were followed.

CHAPTER 4

RESEARCH FINDINGS

4.0 Introduction

The main objective of this chapter is to present the research findings of the study on smallholder farmer's perceptions of drought tolerant maize crops in Cork Village in the Mpumalanga province of South Africa. This chapter analyses the factors that pushed small scale farmers to grow drought tolerant maize. It analyses the drought tolerant maize varieties grown by smallholder farmers in Cork Village. It also discusses the perceived benefits of growing drought tolerant maize, as well as the challenges that smallholder farmers are facing when growing drought tolerant maize.

Research findings were obtained through a questionnaire survey, focus group discussions and interviews. Data is presented in line with the thematic areas of the study and tables and graphs are used to present the research findings of the study. The following section discussed the demographics of the respondents, to identify if the respondents were qualified to give information on the topic.

4.1 Demographic Profile of Respondents

Below is a percentage bar graph summarising the gender of the respondents (figure 4.1).

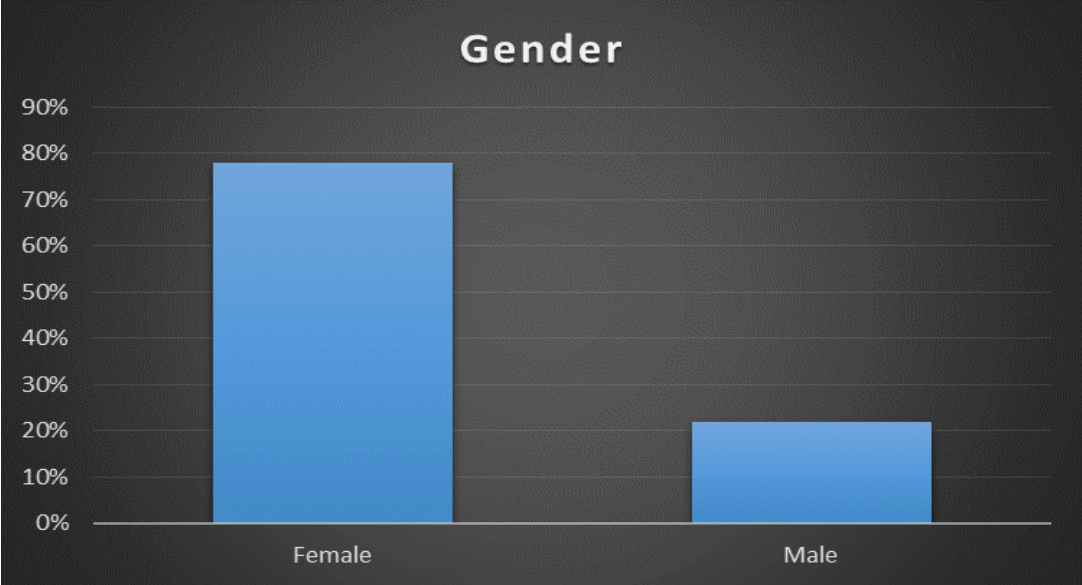


Figure 4.1: Gender Profile of the Respondents

The above percentage bar graph shows that 22% of the respondent were male and 78% were females. This shows that agriculture in Cork Village is feminised due to the drought which is pushing men to look for wage labour in nearby parks and towns. These findings corroborate with Mahlombe’s (2019) study which found that in rural areas of South Africa there are more female farmers than men. Owing to this, women are undertaking the majority of agricultural work, as well as domestic and reproductive work (Okali, 2011). The following is a percentage bar graph showing marital status of the respondents.

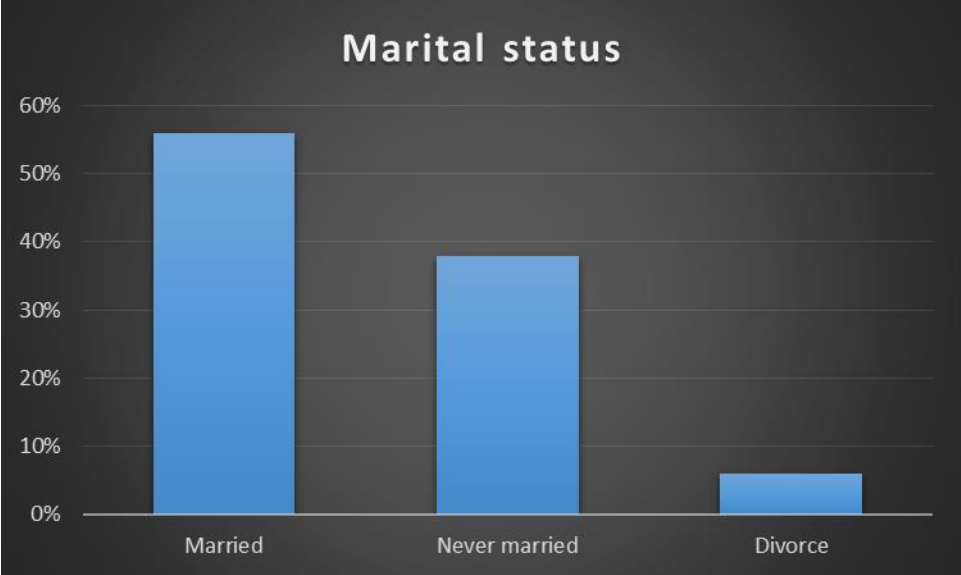


Figure 4.2: Marital Status of the Respondents

The above percentage bar graph shows that most of the respondents in the study were married (56%), while 38% were never married and 6% were divorced. This shows that the majority of smallholder famers are married in Cork Village. The following is a pie chart showing the educational level of the respondents.

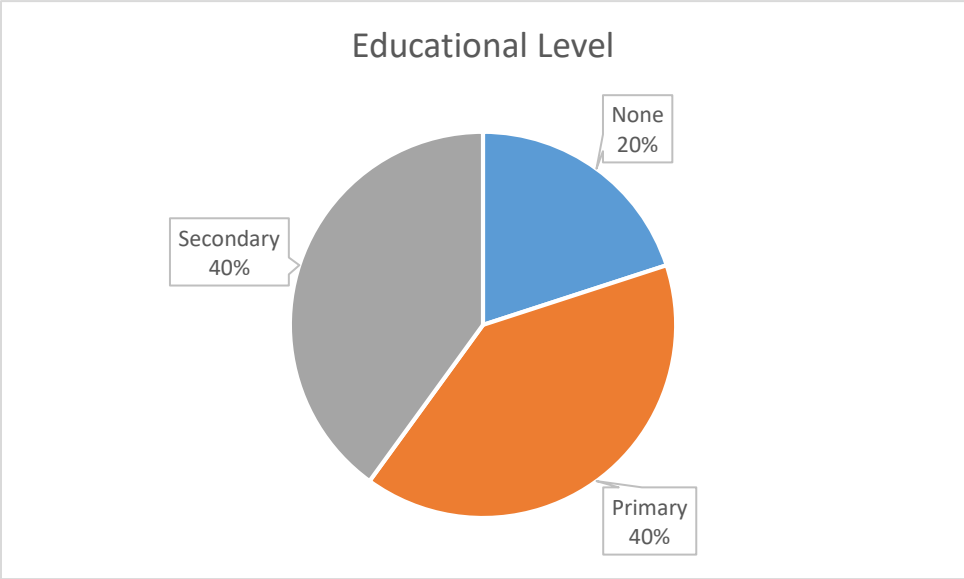


Figure 4.3: Educational Level of the Respondents

The above pie chart shows that 20% of the respondents in Cork Village did not go to school, 40% attained primary education and 40% attained secondary education. The study found that education is a major determinant which pushed farmers to adopt drought tolerant maize and the study discovered that the more the farmers are educated, the more they will adopt drought tolerant maize crops. The following is a pie chart showing the types of households in Cork Village are de facto female headed households, de jure female headed households, and male headed households.

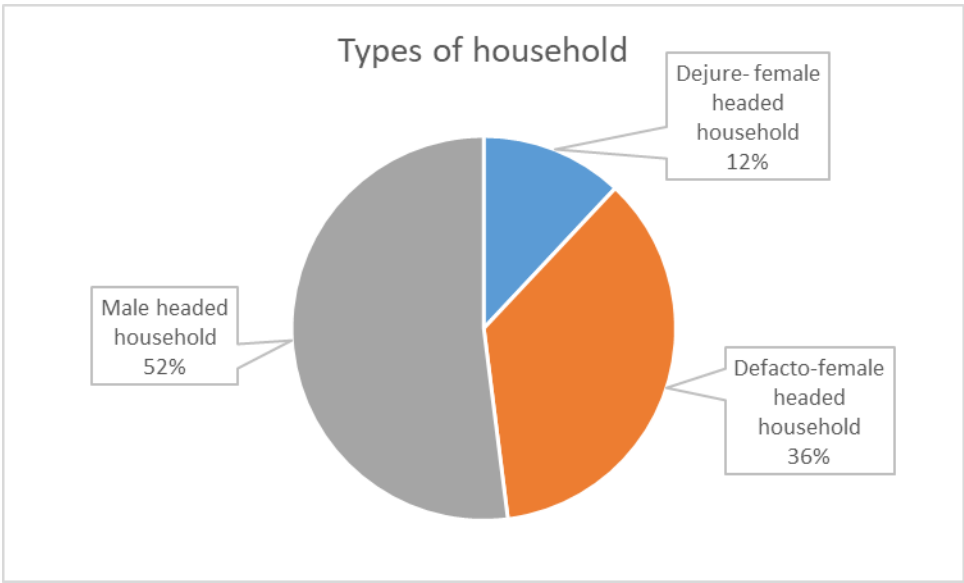


Figure 4.4: Types of Households of the Respondents

The above pie chart shows that 36% of the respondents were de *facto* female headed households, 12% were *de jure* female headed households and 52% of the respondents were from male headed households.

4.2 Factors Pushing Smallholder Farmers to grow Drought Tolerant Maize

4.2.1 Increase in the occurrence of droughts

The study found that an increase in the occurrence of droughts has pushed farmers in Cork Village to grow drought tolerant crops because long seasonal maize crops were failing due to sustained drought conditions. An interview with an elderly women revealed that prior to 2010, droughts were less severe but from the year 2010 to 2020 droughts were very severe and open pollinated maize crops were failing to germinate while some plants withered before they produce maize cobs, and others produced short maize cobs with less corn. Farmers complained that during this period some maize crops failed to reach the tasseling stage and some complained that their maize crops would be burned at knee height by drought conditions.

4.2.2 Lower agricultural harvests

The study found that farmers grew drought tolerant maize crops due to lower agricultural output of open pollinated maize varieties and long seasonal maize crop varieties. Farmers revealed that due to an increase in droughts they were producing a minimum of a fifty kilogram bag of maize, and this was not even enough to provide food for the household. The study found that the average number of household members was four and given the lower agricultural harvest, the food produced was insufficient for most households.

4.2.3 Food insecurity

The study found that farmers were growing drought tolerant maize crops due to hunger which was caused by crop failure of open pollinated maize varieties and long seasonal maize crops, as well as lower yields of maize crops. The study found that farmers in Cork Village were food insecure and most of them have reduced the number of meals they eat per day to save household food. Information obtained from the focus group discussions revealed that most households eat two meals per day.

4.2.4 Government provision of Drought Tolerant Maize

The study found that farmers in Cork Village were growing drought tolerant maize crops due to a government programme called Phezukomkhono Mlimi which was introduced in response to droughts which were resulting in crop failure, lower yields and hunger. The programme was introduced to encourage the farmers to go back to farming because many had left farming because of droughts and the increasing disappointments of poor yields and crop failure which caused them to be food insecure. Because of this, the Agricultural Research Council and Department of Agriculture collaborated in the year 2018 and conducted trials on drought tolerant maize crops in rural areas to help farmers to get good harvests and reduce hunger in rural areas.

4.2.5 Increasing household income

The study found that farmers were growing drought tolerant maize crops to generate household income. The study found that yields from these crops were better because they withstand drought conditions in comparison to open pollinated varieties of maize crops. Farmers revealed that they harvested at least one tonne of maize per hectare and this helped farmers to have a good household income from the sale of maize to the locals and millers. Before the introduction of the drought tolerant maize crop farmers would hardly get extra household income because open pollinated varieties crops failed to sustain in drought conditions and yields were very poor.

4.2.6 Agro-ecological conditions of the area

The study found that farmers in Cork Village were now growing drought tolerant maize crops because of the agro-ecological conditions of the area. Information obtained from the focus group discussion revealed that Cork Village is in a dry region, rainfall is very poor and agricultural land is becoming unfit to grow open pollinated varieties and indigenous/ traditional seed varieties of maize mature later and were intolerant to drought conditions. Because of this, farmers were pushed to adopt drought tolerant maize seed varieties which are tolerant to dry conditions in Cork Village.

4.3 Drought Tolerant Maize Varieties Grown by Smallholder Farmers

The study found that farmers in Cork Village grew different varieties of drought tolerant maize crops which they buy from the shops, and some get them in the form of a government subsidy. Moreover, the study found that farmers in Cork Village grew Water Efficient Maize of Africa (WEMA) varieties which are WEMA 606, 607, 608, 609, and 610. Farmers grew these maize crop varieties because they withstand drought conditions and require little water to survive until harvest. More so, these crops are not easily attacked by insects and birds; thus they give better grain quality, quality mealie meal after milling and they mature fast; furthermore, the maize taste good when cooked or roasted. Respondents revealed that even when these varieties are planted late, farmers still get a good harvest. Information obtained from the respondents revealed that farmers who are growing this crop get at least a ton per hectare.

The study found that farmers in Cork Village also grew DKC78/45 from Monsanto Seed Company. This maize crop variety is given to farmers under the government programme called Phezukomkhono Mlimi at the beginning of each farming season to help poor households who cannot afford to buy farming inputs to increase food security in rural areas. Farmers revealed that this crop withstands drought conditions, and it produces multiple maize cobs and the size of maize cobs is big in contrast to open pollinated varieties. In addition to this, the harvest of this maize crop is better compared to open pollinated varieties or crop maize seed varieties. Most of the respondents indicated that they are satisfied with the drought tolerant maize varieties introduced to them because of the good maize output, better grain quality and it not being easily attacked by insects and birds or stock borer; moreover these varieties have better grain quality.

4.4 The Perceived Benefits of Growing Drought Tolerant Maize.

4.4.1 Increase in agricultural yield

The study found that growing drought tolerant maize crops increased agricultural yields of maize. Information obtained from focus group discussions found that agricultural output of drought tolerant maize crops was better than open pollinated maize varieties. Farmers revealed that they were now getting at least one tonne of maize yields when they grow drought tolerant maize crops. Before the introduction of drought tolerant maize varieties, yields of open pollination varieties were very poor and farmers hardly got a half ton because these indigenous maize varieties were failing to withstand drought conditions.

4.4.2 Increase in grain reserves

The study found that farmers in Cork Village revealed that growing drought tolerant maize improved household grain reserves of maize due to an increase in agricultural output. The study found that household maize reserves improved to two tonnes when drought tolerant maize crops were introduced. Before the introduction of drought tolerant maize crops, it was hard for farmers to store maize because agricultural output of indigenous maize varieties was very poor. Information obtained from focus group discussions revealed that harvests from indigenous maize varieties could not be stored for future use.

4.4.3 Improved household food security

The study found that drought tolerant maize crops improved household food security through an increase in agricultural output and an improvement in grain reserves. Information obtained from focus group discussions revealed that the number of meals each household eats daily increased to three. In addition to this, the study found that farmers stopped borrowing maize meal from their neighbours, cutting meals per deals and reducing food portions each household member should eat. Other farmers revealed that they have withdrawn their participation as food recipients from charitable organisations such as the Department of Social Development because they had enough food.

4.4.4 Improved household income

The study found that growing drought tolerant maize crop varieties helped farmers to improve household income through an increase in surplus agricultural output. Information obtained from focus group discussions revealed that farmers were getting surplus maize of two tonnes or more which they managed to sell to immigrants, the local community and to commercial millers such as Blinkwater. Farmers revealed that they were selling their green maize cobs to hawkers and a fifty kilogram bag of green maize cobs cost R200. Moreover, some women farmers reported that they sell cooked and roasted maize cobs to the individuals in townships and along the roads in Mkhuhlu plaza. A roasted or a boiled maize cob costs R10. This helped farmer to generate household income to purchase food and to meet the basic needs of the household.

4.4.5 Household expenditure reduced

The study found that household expenditure on food for domestic use reduced significantly because farmers were producing enough maize to meet the food requirements of their household. The study found that before the introduction of drought tolerant maize seed varieties, farmers were harvesting little maize which was not enough to meet the food requirements of the households and thus, the household expenditure was very high. The study also found that most households were very poor and had an average number of four people which means that to meet food requirements per month, each household required between twenty five to fifty kilograms of maize meal. The study found that a lot of people struggled to raise income to buy food because they had limited sources of income and household expenditure on food was high.

4.5 Challenges Small Holder Farmers are facing when growing Drought Tolerant Maize Crops

4.5.1 Drought tolerant maize crops cannot be replanted

The study found that farmers complained that drought tolerant maize crops cannot be replanted. Farmers in Cork Village revealed that drought tolerant maize crops cannot be replanted after harvest in the next agricultural season because these crops lose vigour and the germination pattern of these crops is very poor if replanted after harvest. Some female farmers complained that the harvest of these replanted crops is very poor. A farmer who recalled her experiences revealed that she harvested less than half of a tonne after she replanted these maize varieties from her last harvest.

4.5.2 Drought tolerant crops are not locally available

The study found drought tolerant maize crop varieties are not locally available from the market such AFGRI- Agri Service, Hinterland. Farmers complained that drought tolerant maize crops are only purchased through the agent with the help of agricultural advisors. Furthermore, farmers complained that these maize seed varieties are still under the control of private researchers such as the Agricultural Research Council which is limiting farmers' access to buy these crops.

Some even complained that these private researchers limit them as to the amount of seeds they want to purchase. Information obtained from focus group discussions revealed that farmers are limited to buy only two kilograms of maize seeds and they are now being forced to make each adult household member go and purchase so that they buy more seeds. Other farmers complained that since drought tolerant maize crops are under the control of private companies and researchers, they are experiencing delays in accessing these and this is causing delays during the planting season, or farmers are ending up missing the rainfall that is crucial for seed germination.

4.5.3 Easily affected by weather conditions

The study found that farmers complained that drought tolerant maize seed varieties are easily affected by high temperature conditions. Farmers reported that if maize seeds are poorly stored after purchase, they lose vigour. Most farmers complained that they have experienced poor maize seed germination, and some have observed that the growing pattern to the harvest stage was very poor, and farmer's yields have been greatly affected because of poor storage of maize seeds.

4.5.4 Drought tolerant maize seeds are very expensive

The study found that farmers complained that drought tolerant maize seed varieties are very expensive to purchase. Information obtained from the focus group discussion revealed that a two kilograms bag of drought tolerant maize crops costed R275 and most farmers revealed that they cannot afford to buy these seeds given the size of land they want to plant. Farmers revealed that ordinary maize seeds such as Kalahari maize, are much cheaper as these seed varieties cost R100 per two kilogram bag.

4.6 Summary

This chapter presented the research findings of the study on smallholder farmers' perceptions of drought tolerant maize crops in Cork Village in the Mpumalanga Province of South Africa. It analysed the factors that pushed small scale farmers to grow drought tolerant maize. It also analysed the drought tolerant maize varieties grown by smallholder farmers in Cork Village. Furthermore, it discussed the perceived benefits of growing drought tolerant maize. It also discussed the challenges that smallholder farmers are facing when growing drought tolerant maize.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary, conclusion and recommendation of the study. The summary provides a brief account of the research findings. It concludes the research findings of the study in line with the objectives of the study and it provides recommendations based on the research findings of the study and suggests future studies. The aim of the study was to explore the perception of smallholder farmers on drought tolerant maize crops in Cork Village in the Mpumalanga Province. It explored the factors that pushed small holder farmers to grow drought tolerant maize crops. It investigated different types of drought tolerant maize varieties farmers grow. It explored the benefits of growing drought tolerant maize crops. Lastly, it explored the challenges farmers faced when growing drought tolerant maize crops.

5.1 Summary

This study was carried out to understand the perceptions of smallholder farmers of drought tolerant maize in the drought prone area of Cork Village in Mpumalanga. The review of literature found that no similar studies have been carried on the perceptions of small holder farmers on drought tolerant maize. The study was guided by a pragmatic research philosophy that used a mixed research methodology to answer the research objectives of the study.

Because of droughts which are threatening the agricultural production of open pollinated maize seed varieties, farmers in Cork Village were pushed to grow drought tolerant maize, to increase agricultural production, to improve household food security and to generate household income. In addition to this, the agro-ecological conditions in Cork Village are worsening and open pollinated varieties are now failing to withstand dry conditions which are currently prevailing in Cork Village.

Farmers grew Monsanto seeds and Water Efficient Maize of Africa seeds and these maize seed varieties have proven to withstand drought conditions in Cork Village, as they required little rain to survive during mid dry seasons, they resisted pests and crop diseases and they matured early in contrast to open pollinated maize seeds. Evidence shows that drought tolerant maize crops have helped farmers to increase their agricultural output of maize, and this has helped to increase household grain reserves and to improve household food security, opportunities to generate income from the locals and the millers.

However, farmers complained that drought tolerant maize crop varieties were not accessible from the local markets, and this made them very expensive to buy from the agents. In addition, farmers complained that these maize seed varieties cannot be replanted after harvest; moreover, they require special storage when purchased because they lose vigour if they are improperly stored.

5.2 Conclusion

The study concludes that farmers are now growing drought tolerant maize crops in response to the persistent droughts because these require little water to survive and they mature earlier than open pollinated crops. In addition to this, drought tolerant maize crops are helping farmers to increase agricultural output and to improve household food security and this is helping to reduce rural poverty in semi-arid regions of South Africa. Although farmers are growing drought tolerant maize crop varieties, people living in rural areas are still struggling to buy these crops because they are expensive given the socio-economic characteristics of most people living in rural areas of South Africa.

5.3 Recommendations

Based on the research findings of the study, this study recommends the following:

- The governments should subsidize the price of drought tolerant maize seed varieties.
- The government and private institutions should increase the availability of drought tolerant maize seed in the markets.
- The government should conduct awareness campaigns to encourage farmers to grow drought tolerant maize varieties.
- Farmers should create groups or cooperatives to buy drought tolerant maize crop varieties in bulk and at lower prices.

5.4 Suggestion for Further Research

Based on the research findings of the study, the study recommends future studies to investigate the contribution of drought tolerant maize varieties to household food security.

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ANNEXURE

Annexure A: Informed Consent Information

My name is **Mpho Mafune**, a master's student at Nelson Mandela University, Faculty of Business and Economic Sciences. I am conducting a study on "**Smallholder farmers' perceptions of drought tolerant maize crop in Cork village in Mpumalanga Province**" in partial fulfillment of the requirements for the award of Master of Arts Degree in Development Studies.

This study is aimed at understanding the perceptions of smallholder farmers of using drought-tolerant maize in the drought prone region of Mpumalanga to improve household food security.

Please note:

- i.) Your participation is voluntary and there will be no penalty or loss of benefit if you decide not to take part
- ii.) You have the right to withdraw from the survey at any time
- iii.) You have the right to ask questions about the survey
- iv.) The information you will provide is confidential and will be used strictly for academic purposes only
- v.) Consent is granted by you taking part in this interview.

For further information and clarification, please feel free to contact Nelson Mandela University, Faculty of Business and Economic Sciences.

Annexure B: Focus group discussion

Guiding question

1. What pushed smallholder farmers to grow drought tolerant maize in this village?
2. What are the drought tolerant maize varieties do you grow?
3. What are the benefits of growing drought tolerant maize?
4. What problems smallholder farmers are facing when growing drought tolerant crops?

Annexure C:Key informant interview guide

Guiding question

1. What are the drought tolerant maize varieties grown by smallholder farmers?
2. What pushed smallholder farmers to grow drought tolerant maize in this village?
3. What are the farmer's experiences of growing drought tolerant maize?
4. What are the problems smallholder farmers facing when growing drought tolerant crops?

Annexure D: Farmer Questionnaire

Guiding question

PART A: DEMOGRAPHIC INFORMATION	
1. What is your gender?	
Male	<input type="checkbox"/>
Female	<input type="checkbox"/>
2. What is your age?	<i>years</i>
3. What is your highest level of education achieved?	
None	<input type="checkbox"/>
Primary	<input type="checkbox"/>
Secondary	<input type="checkbox"/>
4. What is your marital status?	
Never married	<input type="checkbox"/>
Married	<input type="checkbox"/>
Divorced	<input type="checkbox"/>
Separated	<input type="checkbox"/>
Widower	<input type="checkbox"/>
PART B: SOCIOECONOMIC CHARACTERISTICS	
5. What is the type of household?	
Male headed household	<input type="checkbox"/>
Female headed household	<input type="checkbox"/>
Female child headed household	<input type="checkbox"/>
Male child headed household	<input type="checkbox"/>
6. How many people are in this household?	
PART C: PERCEPTIONS ON DROUGHT TOLERANT MAIZE	

7. How would you rate the current rainfall pattern in supporting maize production?

- Poor
- Below average
- Average
- Above average
- Excellent

8. Have you ever grown drought tolerant maize?

- Yes
- No

9. If yes, what made you decide to grow drought tolerant maize?

.....
.....
.....

10. Which drought tolerant maize varieties are you growing?

.....
.....

11. How much land do you use for drought tolerant maize?

12. How many years have you been growing drought tolerant maize?

..... years

13. When did you first hear about drought tolerant maize?

.....

14. From who/where did you first hear about drought tolerant maize?

- Multimedia (Radio/Television)
- Family member

Friend

Agricultural expo

Extension officer

Other (specify)

15. What are the advantages of growing drought tolerant maize?

16. What are the challenges associated with drought tolerant maize varieties?

Annexure E: Ethics Form



PO Box 77000, Nelson Mandela University, Port Elizabeth, 6001, South Africa mandela.ac.za

Chairperson: Faculty Research Ethics Committee (Human)
Tel: +27 (0)41 504 2504

Ref: [H20-BE8-DEV-024] / Approval]

13 May 2020

Prof J Cherry
Department: Development Studies

Dear Prof Cherry,

TITLE OF STUDY: SMALLHOLDER FARMERS' PERCEPTIONS OF DROUGHT TOLERANT MAIZE CROP IN CORK VILLAGE IN MPUMALANGA PROVINCE (MA)

PRP: Prof J Cherry
PI: M Mafune

Your above-entitled application served at the *Faculty Ethics Committee of the Faculty of Business and Economic Science, (19 October 2019)* for approval. The study is classified as a negligible/low risk study. The ethics clearance reference number is H20-BE8-DEV-024 and approval is subject to the following conditions:

1. The immediate completion and return of the attached acknowledgement to Lindle@mandela.ac.za, the date of receipt of such returned acknowledgement determining the final date of approval for the study where after data collection may commence.
2. Approval for data collection is for 1 calendar year from date of receipt of above mentioned acknowledgement.
3. The submission of an annual progress report by the PRP on the data collection activities of the study (form RECH-004 to be made available shortly on Research Ethics Committee (Human) portal) by 15 December this year for studies approved/extended in the period October of the previous year up to and including September of this year, or 15 December next year for studies approved/extended after September this year.
4. In the event of a requirement to extend the period of data collection (i.e. for a period in excess of 1 calendar year from date of approval), completion of an extension request is required (form RECH-005 to be made available shortly on Research Ethics Committee (Human) portal)
5. In the event of any changes made to the study (excluding extension of the study), completion of an amendments form is required (form RECH-006 to be made available shortly on Research Ethics Committee (Human) portal).
6. Immediate submission (and possible discontinuation of the study in the case of serious events) of the relevant report to RECH (form RECH-007 to be made available shortly on Research Ethics Committee (Human) portal) in the event of any unanticipated problems, serious incidents or adverse events observed during the course of the study.
7. Immediate submission of a Study Termination Report to RECH (form RECH-008 to be made available shortly on Research Ethics Committee (Human) portal) upon unexpected closure/termination of study.
8. Immediate submission of a Study Exception Report of RECH (form RECH-009 to be made available shortly on Research Ethics Committee (Human) portal) in the event of any study deviations, violations and/or exceptions.
9. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of Research Ethics Committee (Human).

Please quote the ethics clearance reference number in all correspondence and enquiries related to the study. For speedy processing of email queries (to be directed to Lindle@mandela.ac.za), it is recommended that the ethics clearance reference number together with an indication of the query appear in the subject line of the email.

We wish you well with the study.

Yours sincerely

A handwritten signature in black ink, appearing to read 'S Mago', written in a cursive style.

Prof S Mago

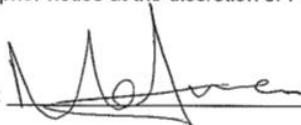
Cc: Department of Research Capacity Development
Faculty Research Co-ordinator: Lindle van Rensburg

ACKNOWLEDGEMENT OF CONDITIONS FOR ETHICS APPROVAL
--

I, **Prof J Cherry** (PRP) of the study entitled **SMALLHOLDER FARMERS' PERCEPTIONS OF DROUGHT TOLERANT MAIZE CROP IN CORK VILLAGE IN MPUMALANGA PROVINCE (MA) (H20-BES-DEV-024)**, do hereby agree to the following approval conditions:

1. The submission of an annual progress report by myself on the data collection activities of the study by 15 December this year for studies approved in the period October of the previous year up to and including September of this year, or 15 December next year for studies approved after September this year. It is noted that there will be no call for the submission thereof. The onus for submission of the annual report by the stipulated date rests on myself.
2. Submission of the relevant request to Faculty RECH in the event of any amendments to the study for approval by Faculty RECH prior to any partial or full implementation thereof.
3. Submission of the relevant request to Faculty RECH in the event of any extension to the study for approval by Faculty RECH prior to the implementation thereof.
4. Immediate submission of the relevant report to Faculty RECH in the event of any unanticipated problems, serious incidents or adverse events.
5. Immediate discontinuation of the study in the event of any serious unanticipated problems, serious incidents or serious adverse events.
6. Immediate submission of the relevant report to Faculty RECH in the event of the unexpected closure/discontinuation of the study (for example, de-registration of the PI).
7. Immediate submission of the relevant report to Faculty RECH in the event of study deviations, violations and/or exceptions.
8. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of Faculty RECH.

Signed: _____



Date: _____

14 / 05 / 2020

Annexure F: Turnitin Report

Turnitin Originality Report

- Processed on: 19-Nov-2021 12:42 SAST
- ID: 1707522830
- Word Count: 14319
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Annexure G: Letter from Editor

Editing Service: Lee Kemp

14 Carlisle St

Mount Croix

Port Elizabeth

6001

16 November 2021

082 723 5408

TO WHOM IT MAY CONCERN

EDITING OF DISSERTATION: MS MPHO MAFUNE (s219148961)

This serves to confirm that I edited Ms. Mafune's Master Arts (Development Studies) Dissertation, which is to be submitted to the Faculty of Business and Economic Sciences at the Nelson Mandela University. The editing covered all aspects of language, punctuation and layout. I also crosschecked the in-text references against the reference list. Additionally, I edited the reference list. In the process I used the Review facility in MSWord. I have no knowledge if the student accepted all the corrections made; thus, I cannot be held responsible for any remaining errors.

Yours faithfully



Ms. L. Kemp

B. A. (Hons English); MBA

Member: Nelson Mandela University Editors' Forum