Socio-Economic Impact of Drought Induced Disasters on Farm Owners of Nkonkobe Local Municipality.

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DECLARATION OF ORIGINALITY

I hereby wish to declare that the work contained in this dissertation is my own original work, that all sources used or quoted, have been indicated and acknowledged by means of complete references, and that this dissertation was not previously submitted by me or any other person at any other university for a degree.

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ABSTRACT

Much is known about the environmental impacts of drought and very little is known about the socio-economic impacts particularly on farm owners whose livelihood is mainly dependent on agricultural production. This study investigates the socio economic impact of 2004 drought on farm owners of Nkonkobe Local Municipality in the Eastern Cape Province of South Africa. The areas of Nkonkobe Local Municipality that were visited include Fort Beaufort, Seymour, Balfour, Alice and Middledrift. Only farm owners from the areas that were reported to have been affected by the 2004 drought were visited and interviewed. The information on areas that were affected by 2004 drought was retrieved from the files of the Department of Agriculture in Amathole District Municipality. The study was conducted using both quantitative and qualitative research methodologies. Stratified random sampling technique was used because the population of Nkonkobe consists of different types of farmers including commercial, emerging and communal farmers. In addition to the main objective, the sub objectives of this study include evaluation of the extent of intervention made by government in 2004, evaluating the status of drought mitigation strategies and/or drought plans in Nkonkobe during 2004 and presently.

The findings of the study reveal that Nkonkobe Municipality has the largest number of livestock and communal farming is practised on the largest scale. Apart from the impressive literacy rate, the majority of farm owners do not have agricultural training and as a result of that, they do not know how to develop drought plans. High poverty rate in Nkonkobe has contributed towards low level agricultural training because most of the farmers cited lack of money as their reason for not undergoing training. The high percentage of uninsured farmers is a cause for concern because it means that government will continue to spend large amounts of money on drought relief. Other socio economic impacts that were experienced by farmers in different areas of Nkonkobe include a decline in the educational access of children, deterioration of health condition for farm families, high levels of debts, migration of family members to urban areas, loss of hope and high stress levels of affected families.

DEDICATION

I would like to dedicate this achievement to my mother, Nomvuyo Mniki, who brought me up under the difficult circumstances after the death of my father in 1990. This is for her, *"My mother; it is never easy being a single parent"*. To my late father, Temba Mniki, who was my inspiration. This is a gesture of appreciation to him for believing in me the way he did. Lastly, I would like to dedicate it to my wife Pamela and my daughter Pumelela for being so understanding when I was not able to spend enough time with them.

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ACRONYMS

ABEM	Abongi Bemvelo Environmental Management
ADM IDP	Amathole District Municipality Integrated development Plan
ADM	Amathole District Municipality
ADM	Amathole District Municipality
AFRA	Association for Rural Advancement
ANDG	Acting National Director General
ARDDC	Agriculture and Rural Development Drought Committee Commission
D0A	Department of Agriculture
DMA	Disaster Management Act
DPRTG	Drought Policy Review Task Group
DWAF	Department of Water Affairs
EC D0A	Eastern Cape Department of Agriculture Strategic Plan
ECDoA	Eastern Cape Department of Agriculture
ECPDMC	Eastern Cape Provincial Disaster Management Centre
EDAR	Eastern Cape Drought Assessment report
FAO – UN	Food and Agriculture Organization of the United Nations.
FAO	Food and Agriculture Organization of the United Nations.
FEWS	Famine Early Warning System
GOB–MFDP	Government of Botswana – Ministry of Finance, Development
GOSA–DOA	Government of South Africa – Department of Agriculture
GOSA–DOA	Government of South Africa – Department of Agriculture

GOZ–NEPC	Government of Zimbabwe – National Economic Planning
GOZ–NEPC	Government of Zimbabwe – National Economic Planning Commission
ICARDA	International Centre for Agricultural Research in the Dry Areas
LGTA SG	Department of Local government ans Traditional Affairs Strategic Plan
NDG	National Director General
NDSD	National Department of Social Development.
NDVI	Normalised Difference Vegetation Index
NLM IDP	Nkonkobe Local Municipality Integrated development Plan
NLM	Nkonkobe Local Municipality
NPDM	National Policy on Drought Management
PDDMC	Provincial Drought Disaster Management Committee Planning
RSA	Republic of South Africa
SADC	Southern African Development Community
SA DIB	South African Drought Information Bulletin
SADC–IUCN	Southern African Development Community– International Union
SARDC	Southern African Research and Documentation Centre
UFS	University of Free State
UNEP	United Nations Environment Programme
USDA	United States Department of Agriculture.
WSI	Water Satisfaction Index
WEFA	Women Economic Empowerment Association

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CHAPTER 1: INTRODUCTION

1. Background to the Study

Drought is a normal recurring event that affects the livelihoods of millions of people around the world and it is regarded as the most important natural disaster in economic, social and environmental terms (Buckland, Eele & Mugwara 2000). A serious drought or a series of consecutive droughts can be a disaster-triggering agent that exacerbates social and economic problems and reduces the overall livelihood security of a society (FAO 2004). These problems are most severe where economies are least diversified and almost everyone depends either directly or indirectly on agriculture. According to the SADC (1999), extended periods of drought can have primary and secondary effects particularly on the household and national economic levels. The same argument seems to be supported by Hulme (1996) and Hulme and Sheard (1999), when they argue that droughts have the potential to reduce agricultural production to the levels that can threaten the livelihood of subsistence farmers.

The South African Agricultural Sector (SAAS) contributes to the economy when farm workers, farmers and their families spend their wages, salaries and agricultural profits on consumer goods and when they buy what is necessary to plough back into the land for agricultural production.

According to Nowers (1998), the Eastern Cape not only has the biggest cattle and sheep herds in South Africa, but it is also where communal farming is practised on the largest scale. In January 2004, the Eastern Cape Province was one of the six provinces of South Africa that was declared as disaster area by President Thabo Mbeki. The others were Kwazulu Natal, Free State, Mpumalanga, Northern Cape and North West (SA DIB 2004).

The focus of this study will be on evaluating the socio-economic impact of 2004 drought on farm owners of Nkonkobe Local Municipality in Amathole District Municipality (ADM) in the Eastern Cape Province of South Africa.

The majority of the community in ADM are living in fragile and vulnerable conditions because of the high level of poverty, low standards of living, environmental degradation, poor

household economies and lack of access to resources. The whole district experiences very low, erratic rainfall and drought is a common occurrence (ABEM 2006).

1.1 Description of the study area

The study area is in the Eastern Cape Province which officially came into being during 1994 when South Africa was subdivided into nine new provinces which include the following: Limpopo, Mpumalanga, Gauteng, Northwest, Free State, Kwazulu Natal, Northern Cape, Western Cape and Eastern Cape Provinces (**Lent, Scogings & Van Averbeke** 2000).

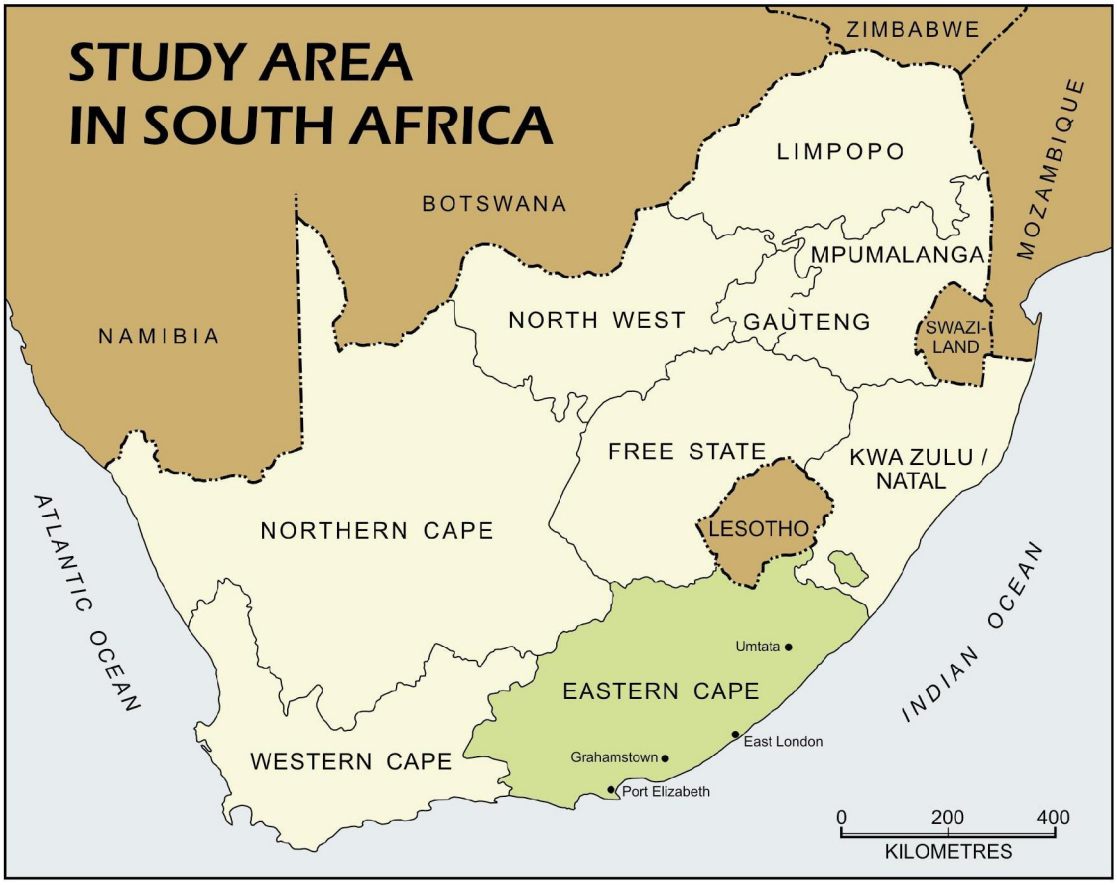

Figure 1 Shows the Location of the Eastern Cape Province in South Africa (Pyle, 2006).

The Eastern Cape Province is made up of 45 municipalities which are grouped as follows: One Metropolitan, Six District Municipalities (DMs) and 38 Local Municipalities (LMs). Nkonkobe LM is one of the Eight LMs that fall within the jurisdiction of ADM.

ADM stretches along the coastline of the south- eastern part of the Eastern Cape Province and in addition to Nkonkobe, it includes the following: Amahlathi, Mnquma, Nxuba, Mbhashe, Peddie and Great Kei Local Municipalities.

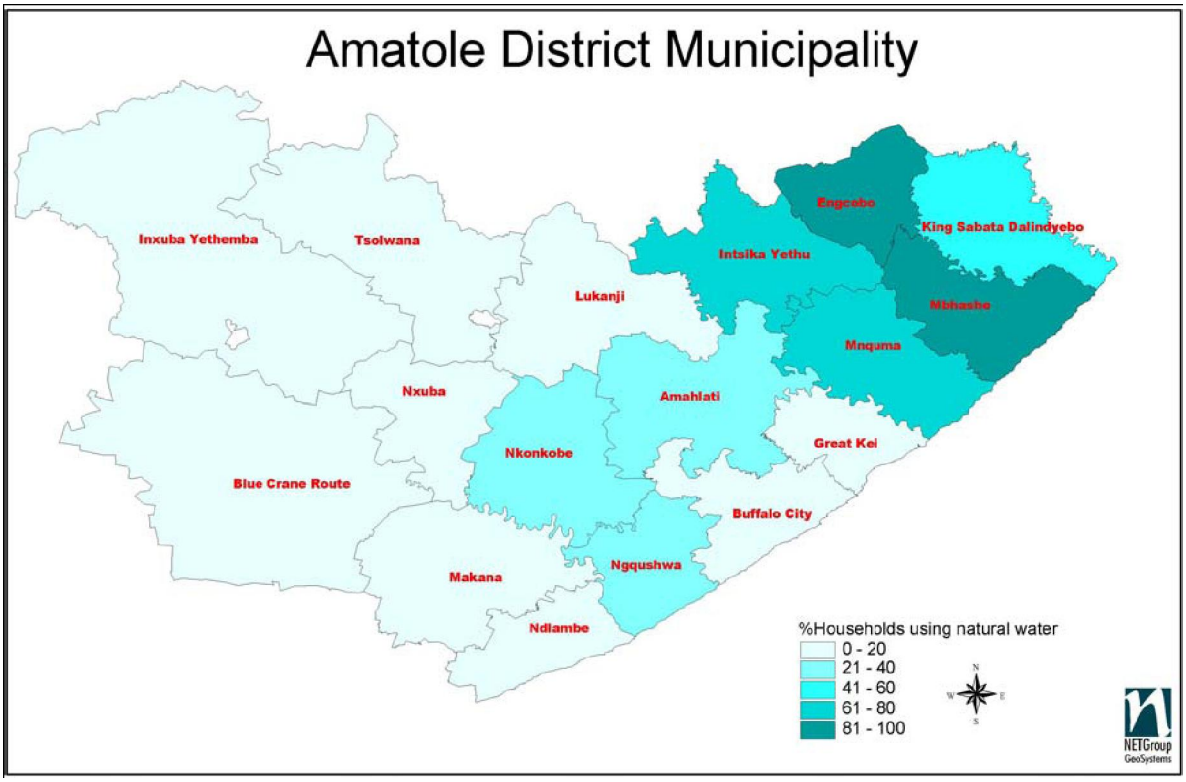

Figure 2 Shows the Location of the Local Municipalities and the Percentage of Households Using Natural Water Within the ADM Area (ABEM, 2006).

The ADM region is prone to droughts, floods, severe storms and tornadoes in summer and strong winds are causing high fire danger in winter (ABEM 2006).

Nkonkobe Local Municipality (NLM) is the second largest local Municipality covering 3725 square kilometres, and constituting 16% of the surface area of ADM. NLM has an average of 43 people per km or 0.43 people per hectare and is made up of 21 wards and 194 villages (Nkonkobe Municipality: IDP 2006/2007).

1.1.1 Socio economic analysis of the study area

The Eastern Cape Province is rated as the poorest of all other provinces with the population of 6 436 769. People are evenly distributed across the province. The average of women to men with 2001 Census recorded a 4:46 ratio, which is higher than the national average. The

population is getting increasingly younger with 71% below the age of 35 **(**EC DLGTA SP 2008/2009).

Approximately 42.2% of the population has a secondary education with 22.8% having no schooling and 19.6% having only primary schooling. This low level of education can affect the individual's ability to contribute meaningfully in terms of community development. In the age group 15-65, two million people are not economically active, 908 000 people are unemployed and only 754 000 employed. Of those fortunate to be employed, the majority (295 000) earn R800 per month or less (EC DLGTA SP 2008/2009). The average age of the experienced farmers is very high and there is insufficient participation by youth in agriculture (EC PDOA SP 2006-2009).

The Eastern Cape not only has the biggest cattle and sheep herds in South Africa, but it is also where communal farming is practised on the largest scale (Nowers 2008). Resource management is dominated by the use of natural vegetation for animal production because crop production potential is limited. The main trend in the communal areas is towards reduced dependence on agriculture and increased dependence on other sources of income, such as wages and pensions. While commercial farmers have access to well-established support systems for finance, marketing and information, the support for communal farmers remain questionable **(**Lent *et al*. 2000).

Amathole District Municipality (ADM) contains 25.9% of the Eastern Cape's total population with an average population density of 63.5 people per square km. The population of the district is predominantly African (92.5%) and almost 60% of them are aged between 15 and 64 while a relatively low 5.6% is 65 years or older. A high proportion of this group is economically active, possibly reflecting migration from rural to urban or semi-urban centres. The gender profile of the region is 47% male and 53% female. The number and percentage of people living below the poverty line has increased significantly from 1996 to 2004 for the Eastern Cape as a whole and particularly for the poorer areas of ADM. Household income levels are low. More than half of the households within the ADM area (52%) record income levels of R0 – R6000 and 26% earn between R6001 to R 18 000 a year. This translates into approximately 80% of households having annual incomes below R18 001 per annum. Education levels are generally low with only 16% of ADM's population having matriculated and at least 10 % with no formal schooling (ADM IDP 2005/2006).

Community services contribute the most to employment (42%) followed by the manufacturing (18%) and then agriculture (13%). Seven percent of the economically active population in Amathole is employed informally. Wholesale is by far the biggest provider of informal jobs throughout the district, making up 53% of informal jobs. The dominance of the public sector in the region's economy reveals the limited production base of the area. Although ADM has high agricultural production potential particularly in livestock, agriculture continues to contribute only 3% to the economy of ADM. Many local municipalities continue to import agricultural products from outside their boundaries despite this potential. This is probably explained by low levels of development, especially high levels of poverty and poor infrastructural development. This suggests that potential and emerging farmers have limited access to resources necessary for production. It is also important to note that although women are dominating the population at 53%, their role in agricultural activities is low. It is therefore important that current programmess aimed at getting women into the agricultural sector are reinforced and broadened. The situation is the same with youth, who form part of a larger group within the District Municipality's population (Wefa 2000 in ADM IDP 2006/2007).

Nkonkobe Local Municipality is the second largest local municipality covering 3 725 km^2, and constituting 16% of the surface area of the Amatole District Municipality. It has an estimated population of 133 434 as recorded by census in 2001 with 36 116 households. About 61% of NLM population resides in villages, 20% resides on farms and scattered settlements and 19% resides in urban settlements, mostly Alice and Fort Beaufort, where the main concentration of businesses occurs (NLM IDP 2005/2006). In terms of population distribution amongst the administrative Districts within the municipality area, 18 135 people reside in Fort Beaufort, 62 719 people in Middledrift, 65 472 in Victoria East [Alice], 2 281 people in Seymour and 703 people in Hogsback (NLM IDP 2005/2006).

The Fort Beaufort area is the most densely populated area with approximately 3035 – 6719 persons per square km. The Alice Town and the immediate surrounding areas account for the second range of population density between 1278 and 3034 persons per square km and there are 62 719 people in the Middledrift area . The dominating group is the Africans which account for (95%) of the population, the coloured group for (3%), white group for (1.2%) followed by other groups at (0.4%). The most dominant age bracket in the Nkonkobe Municipal area is 25 to 35 years and it falls within the statutory definition of young people.

When statistics reveals that young people from age 0 to 35 years form the largest part of the population, the developmental focus should be on youth. The gender ratio indicates that approximately 40% of the total population is males whilst approximately 60% is females. Although there are some areas where males are dominant the significant portion of the Nkonkobe Municipal Area is dominated by females (NLM IDP 2008/2009). The official records reveal that the Nkonkobe Municipal economy is currently able to create jobs for only 3,5 % of the economically active population. The income levels of the people of the Nkonkobe Municipal area are extremely low with 6531 people earning between R 401 and

R 800 while 74% of the people in NLM do not have an income at all. Those people coupled with persons that are earning less than R800 account for 93% of the people of Nkonkobe Municipality (NLM IDP 2008/2009).

1.2 Elucidations of Terms

(a) A farmer means a household that produces crops vegetables/fruit and a household who owns and farms livestock.

(b) A small scale farmer means a communal farmer and a subsistence famer.

(c) Livestock means cattle, sheep and goats.

(d) A communal farmer is a farmer who owns and farm livestock, but is grazing on communal land. These farmers are found mainly in rural areas.

(e) An emerging farmer is a farmer who owns a piece of land, but is mainly dependent on government or non-government organisations for support and finance. Emerging farmers consume and sell some portion of their production including livestock. They are called emerging farmers because they are in the process of graduating from small scale farming to become commercial farmers.

(f) A subsistence farmer means a farmer who produces mainly for own consumption using household labour.

(g) A commercial farmer is a farmer who owns a piece of land, owns and farms large quantities of livestock and/or produces crops intended for the market to be commercially sold (Xotyeni 2008) and (Dubasi 2008).

1.3 Problem Statement

Against this background, six provinces that were declared as disaster areas by former President Thabo Mbeki were mentioned and the Eastern Cape Province was one of them (SA DIB 2004). In terms of Disaster Management (South Africa DoD. 2002), a disaster is declared only when the affected people lack the resource capacity to deal with the occurrence. South Africa experienced three types of droughts in 2004, namely reduction in water resources, significant reduction in the rainfall and reduced crop yields and livestock (SA DIB 2004).

The magnitude and severity of the 2004 drought became evident in Nkonkobe when 1063 farmers submitted applications for drought relief (ADM 2004).

If so many people were affected by drought, then what was the socio-economic impact on the farm owners of Nkonkobe? The previous scientific studies focused solely on hazard risks, but were blind to the socio-economic factors which influenced the potential effects of disasters (Red Cross 2002). This study will address that gap by evaluating the socio-economic impact of the 2004 drought on farm owners of Nkonkobe.

Before 1992, drought response by South African Government focused primarily on mitigating the impact of drought on the industrial and commercial agricultural sectors. Little was done to reduce the impact on the rural areas and response was based on relief rather than mitigation strategies (AFRA 1993). If there was no focus on drought mitigation strategies before 1992, was there a focus in 2004? This study will attempt to answer that question by assessing whether there were drought plans and/or mitigation strategies in 2004. The *status quo* in terms of drought plans will also be assessed.

1.4 Objectives of the study

This study aims to assess and determine the socio-economic effects of the 2004 drought induced disaster to the farm owners of Nkonkobe local Municipality. It also aims to propose appropriate strategies to reduce the impact of drought.

1.4.1 Sub-Objectives

(a) To evaluate the socio-economic effects of drought on farm owners.

(b) To evaluate whether the intervention made by government in 2004, was successful in mitigating the drought effects.

(c) To evaluate the status of drought mitigation strategies and/or drought plans in Nkonkobe during 2004 and at present.

1.4.2 Research Questions

(a) What were the socio-economic effects of the 2004 drought on farm owners of Nkonkobe?

(b) Did the government do enough to assist farmers in 2004?

(c) What was the status of drought mitigation strategies and/or drought plans in Nkonkobe during 2004 and what is the current *status quo*?

1.5 Significance of the Study

Drought is considered by many to be the most complex and least understood of all hazards, affecting more people than any other hazard (UNSO 1999). It is hoped that this study will promote drought awareness and encourage pro-active management of drought as opposed to reactive management by the farming communities.

1.6 Delimitation and Limitations of the Study

The focus of this study will be on farm owners of Nkonkobe area in ADM. ADM is a wide area consisting of eight local municipalities within its area of jurisdiction. The problem that

has been identified is common throughout the district, but due to financial constraints focus will only be on farm owners of NLM. This study will not focus on differential impacts of disasters according to gender because a lot of research has already been done in that area.

1.7 Research Methodology

The socio-economic impact of the 2004 drought on farmers of Nkonkobe Local Municipality was assessed using both quantitative and qualitative research methodologies. According to Creswell (2006), when mixed methods of research are going to be used, it is better to explore the features that characterize it as mixed methodology.

Therefore, the researcher will explain and justify the use of mixed research methodologies in this study under the sub-headings as follows:

1.7.1 Quantitative research methods

According to Glesne and Peshkin (1992), quantitative research uses numbers and statistical methods and it tends to be based on numerical measurement of specific aspects of a phenomena. These two writers further encourage the use of sampling strategies to produce generalizable results. A total number of 1,063 farmers from Nkonkobe area were reported to have submitted applications for drought relief in 2004 (ADM 2004).

Gay (1996) suggests the following guidelines for selecting representative sample size:

- If the population size is less than 100, the whole population should be surveyed.
- If the population size is more than 100, but around 500, 50% should be surveyed.

Based on Gay's suggestion, the researcher targeted the whole population of the villages where fewer than 100 farmers were affected. Alternatively, 50% was targeted for the villages where affected farmers were more than 100, but fewer than 500 (Gay 1996). The village with the highest number had 310 affected farmers and 50% of that was surveyed.

The researcher was targeting 50% of the total number of claims that were submitted, but a total number of 189 questionnaires were returned. The 189 questionnaires were returned as follows: 16 questionnaires from Fort Beaufort, Seymour and Balfour areas, 96 questionnaires from Alice area and 77 questionnaires from the Middledrift area (total number was 189). Only emerging farmers were assessed in Fort Beaufort, Seymour and Balfour area because

there were no records to justify that communal farmers had been affected. The researcher also felt that the questionnaires that were received from other areas were enough to provide credible results as will be explained in chapter 3.

According to Allison, O'Sullivan, Owen, Rice, Rothwell & Saunders (1996) stratified random sampling should be used when the population consists of sub-groups, which are thought to have an effect on the data to be collected. Allison further explains that once the strata have been identified, a simple random sample should be done separately from each stratum. Allison is supported by Leedy and Ormrod (2001) by stating that stratified random sampling has the advantage of guaranteeing representation of the identified strata. Therefore, it was appropriate to use stratified random sampling design in this study because the population of Nkonkobe consists of different types of farmers including the following: commercial, emerging and communal farmers (Xotyeni 2008).

1.7.2 Qualitative research method

Qualitative researchers study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them (Denzin & Lincoln 1994). To support this view, Creswell *et al*. (1988), argues that in qualitative research there are multiple perspectives held by different individuals, with each of these perspectives having equal validity or truth. Impact assessment studies involve making observations, conducting interviews, answering questionnaires and making use of documents; and that qualifies part of the study to be qualitative (Barbie & Mouton 2001). This methodology will be explained further under the sub-headings as follows:

(a) Interviews and Questionnaires

In depth interviews were conducted with farm owners using a combination of structured (closed) and unstructured (open) questions. According to Rubin and Rubin (1995), to conduct qualitative interviews and truly hear what the people say requires skills beyond those of ordinary conversation. In qualitative studies, success can be achieved by encouraging people to describe their worlds in their own words or terms (Rubin & Rubin 1995). The questionnaires in this study were guided by three key questions, such as:

- What are the socio-economic effects of drought on farm families?

- Ø Was the intervention made by government in 2004 successful in mitigating the drought impact?
- Ø What mitigation strategies were in place to deal with the impact of drought and what is the *status quo* presently?

Socio-economic effects that were assessed include economic implications for individual families, loss of crops and livestock as a result of drought, educational access for the children of the affected farm owners and emotional impacts (Leedy & Ormrod 2001).

(b) The Use of Documentation

Documentation that was used to collect the information include the following: Farmers Weekly, Farming SA, Journals, 2004 Drought Reports, Minutes Of Drought Meetings in 2004, Integrated Development Plans (IDP) from Amathole and Nkonkobe municipalities and strategic planning documents of the Eastern Cape province. Information available on the internet was collected and integrated with the data obtained from the above-mentioned sources as suggested by Mouton (2001).

1.8 Data Analysis

Data collected from all participants was summarized as statistics using the SPSS programme and that was achieved through the assistance of the Department of Statistical Analysis of the University of Free State. The data will be analyzed in Chapter 3 by using excel computer software to produce tables, pie charts and histograms as suggested by Mouton (2001).

CHAPTER 2: LITERATURE REVIEW

2. Introduction

Drought is considered by many to be the most complex hazard and the least understood of all natural hazards (Hagman 1984). Therefore the first part of this chapter will focus on drought as a natural hazard and that should enable the readers to understand its complexity better. Particular attention will be given to the characteristics that distinguish drought from other natural hazards and the four common types of drought will also be looked at (Tannehill 1947).

Another focus area that is expected to add value to this chapter is the discussion of the impact of drought-induced natural disasters from the socio economic perspective. The global impacts of droughts will be explained in more details under the following subheadings: Global Assessment of Drought Impacts; Socio Economic Impacts of Drought in Southern Africa; Effects of Drought in South Africa (Obassi 1994).

In addition to the above-mentioned points of discussion, drought management strategies in selected countries which will include Zimbabwe, Mozambique and South Africa will be discussed briefly. This will be followed by the short discussion of coping strategies and drought monitoring methods that are being used in different parts of South Africa (Hazelton, Pearson & Kariuki 1994).

2.1 Drought as a natural hazard

Drought is a normal, recurring feature of climate. It occurs in virtually all climatic regimes. It occurs in high as well as low rainfall areas. It is the consequence of a natural reduction in the amount of precipitation received over an extended period of time, usually a season or more in length and it is often associated with climatic factors such as high temperatures, high winds, and low relative humidity. Drought is also related to the timing for example principal season of occurrence, delays in the start of the rainy season, occurrence of rain in relation to principal crop growth stages and effectiveness of the rains. The severity of drought also depends on the number of rainfall events and rainfall intensity over a period of time. Thus, each drought year is unique in its climatic characteristics and impacts (Wihilite 1992a).

According to Tannehill (1947), there are three characteristics that distinguish drought from other natural hazards:

Firstly, the effects of drought often accumulate slowly over a considerable period of time and may linger for years after the termination of the event and because of that, drought is often referred to as a creeping phenomenon. Although Tannehill (1947) first used this terminology more than fifty years ago, there is still confusion among climatologists in terms of recognizing the onset of drought and scientists and policy makers continue to debate the basis (criteria) for declaring drought a disaster (Wihilite 2000). According to DIM 608 (2007), this confusion has led to severe criticism of scientists by the livestock producers and their criticism is based on the following assumptions:

a) Drought is not instantaneous, but associated with a progressive deterioration of conditions **(**Drought Policy Review Task Group 1990). It can be argued that early intervention would minimise losses and the damage control costs.

b) The character of drought is distinctly regional, reflecting unique meteorological, hydrological, agricultural and socio-economic characteristics (Wihilite 1993). Drought is furthermore, crop specific, as energy flow differs between ecosystems (Fouche 1992). Schulze (1987) argues that drought should be understood regionally and locally in terms of supply and demand, as well as on long term balances in nature.

Secondly, the impacts of droughts are non structural, in contrast to the impacts of floods, hurricanes and most other natural hazards. Its impacts are spread over a larger geographical area than are damages that result from other natural hazards. For these reasons, the quantification of impacts and the provision of disaster relief are far more difficult for drought than it is for other natural hazards. Drought severity is dependent not only on the duration, intensity and spatial extent of a specific drought episode, but also on the demands made by human activities and vegetation on a region's water supply. The characteristics of drought, along with its far-reaching impacts, make its effects on society, economy and environment difficult to identify and quantify (Wihilite 2000).

Thirdly, lack of a precise and universally accepted definition of drought remains a challenge and it adds to the confusion about whether or not a drought exists and, if it does, when should

it be declared a disaster (Wihilite 2000)? Abrams (1997) argues that this question will be answered only if both the natural and social components of drought are better understood and addressed at national, regional and international policy planning levels. For that reason, it will be appropriate to mention and explain the four common types of droughts, namely:

a) **Meteorological:** From the meteorological point of view drought exists when rainfall is abnormally low. Meteorological drought is expressed solely on the basis of the degree of dryness in comparison to some normal or average amount and the duration of the dry period. Thus, intensity and duration are the key characteristics of this type of drought. Definitions of meteorological drought are region-specific, since the atmospheric conditions that result in deficiencies of precipitation are highly region-specific. That explains the reason why it is not possible to apply a definition of drought developed in one part of the world to another without any modifications. For this reason, the questionnaire of this research project will include a question on the definition of a drought disaster from the perspective of the farming community within the area of study (UNEP 2004).

b) **Agricultural:** Agricultural drought exists when soil moisture is depleted to the extent that crop and pasture yields are considerably reduced (Bruwer 1990; Solanes 1986).

c) **Hydrological:** In hydrological terms drought exists when the actual water supply is below the minimum for normal operations and reflects a deficit in the water balance (Bruwer 1990; Solanes 1986). **Research used by** Hazelton *et al.* (1994) regarding hyrological drought shows that Cunha (1983) supports this where he states that drought occurs when there is a deficit in water, including not only precipitation, but also surface and sub-surface water runoff and storage. Hydrological droughts usually lag the occurrence of meteorological and agricultural droughts because more time elapses before precipitation deficiencies are detected in reservoirs, groundwater and other components of the hydrological system.

d) **Socio-economic:** socio economic drought exists when demand for water exceeds supply, usually over an extended period (Solanes 1986). To support this definition Cunha *et al.* (1983) in Hazelton *et al.* (1994), also states that socio economic drought occurs when a significant water deficit takes place that is spread both in time and space.

2.2 Overview of drought induced natural disasters from the socio economic perspective.

Droughts become disasters when both the natural and human environments become highly vulnerable to the adverse impacts of the drought hazards (UNEP 2004). According to Lindell and Prater (2003), natural disasters occur when an extreme geological, meteorological, or hydrological event exceeds the ability of a community to cope with that event. Vulnerability of communities to drought is a function of a number of physical and societal characteristics.

The physical characteristics which are associated with maximum vulnerability to drought include:-

- The existence of a highly variable hydrological and climatic regime that is marginal for agricultural and livestock developments
- Episodic precipitation patterns which promote high rates of sedimentation and siltation; topography and soil patterns that promote soil erosion
- A lack of variety in climatic conditions across the region which weaken the options for relocation in strategies which are intended to reduce the drought risk (UNEP 2004).

Lindell and Prater (2003) further explain that assessing the community impacts of natural disasters is important for three reasons. Firstly, such information is useful to community leaders after a disaster strikes so that they can determine if there is a need for external assistance and, if so, how much. Secondly, information about disaster impacts can be used to identify specific segments of the community that have been affected disproportionately for example low-income households, ethnic minorities, or specific types of businesses, like farmers for instance. Thirdly, planners can develop disaster impact projections before disasters strike to assess potential consequences of alternative hazard adjustments. The physical impact of a disaster is determined by the hazard mitigation practices and emergency preparedness practices of the affected community. The physical impacts, in turn, cause the disaster's social impacts, but these can be reduced by community recovery resources and extra-community assistance. These two writers demonstrate their theory by means of a diagram as follows:

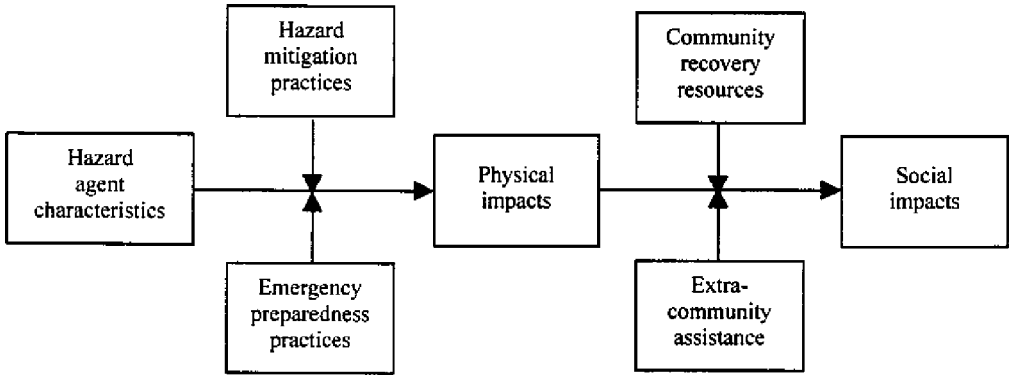

Figure 3 Model of Community Disaster Impacts (Lindell & Prater 2003).

Prater and Lindell (2000) argue that more probable hazards are likely to mobilize communities to engage in hazard mitigation and emergency preparedness measures to reduce their vulnerability.

According to Berke (1995), low income earners are affected the most by the natural disasters compared to the high income earners. This theory will be discussed further in chapter three to determine whether the low income earning farmers are affected the most when comparison is made with the high income earning farmers.

To support Berke's theory Mileti (1999) argues that developing countries are affected the most compared to the developed countries. The societal characteristics that maximize vulnerability to drought include:- poverty, low income levels; high dependence on rain-fed systems; poor planning and management of agricultural water supply and irrigation systems; high population densities and other factors that inhibit population mobility and implementation of traditional coping mechanisms; inexperience of communities to cope with droughts (UNEP 2004). Other important measures of physical impacts, specifically in terms of drought induced disasters are: losses of animals and crops that may be caused by other losses such as loss of land due to soil erosion and loss of vegetative cover (Mileti 1999). UNEP (2004) also argues that droughts tend to bring out the worst in the affected communities in terms of land degradation, famine, increases in the prices of essential commodities, impoverishment, retardation of economic development, political and resource use conflicts and breaking down of social ethics.

2.3 Global Assessment of Drought Impacts

During 1961-91, drought affected 51 percent of the 2.8 billion people who were affected by the natural disasters worldwide (Obassi 1994). During the same period, 3.5 million people perished, 45 percent of them from drought.

The United States (US) is the world's largest producer and leading exporter of agricultural products. The drought years of 1930s in the US Great Plains had tremendous societal implications when it caused millions of people to migrate from the southern Great Plains to Califonia (Hensen, Horsmeyer, Rippey, Kocin & Pinder 1999). A classic example of devastation that occurred in 1988 was when drought caused around $40 billion in damage to the US economy in terms of human health, environment and wildlife. Grain production fell below domestic consumption probably for the first time in fifty years (Riebsame, Changnon & Karl 1990) and (Kogan 1995). Total US corn production dropped by nearly 30 percent (other grain crops also had considerable losses) and the most affected states were in a zone that was experiencing a three-month shortage of rains **(**Kogan 1995). The economic effect of this drought was felt globally because the 1988 total world corn production was 50 million tons less than in 1987 and 75 million tons less than in 1989. Total world grain production in 1988 dropped by three percent (FAO 2000).

Argentina is the world's second largest exporter (after the United States) of corn and coarse grains and the third largest exporter of wheat (FOA 2000). Droughts do not bypass Argentina since the climate provides considerably less precipitation than thermal resources can potentially evaporate; droughts and dry spells are frequent and devastating. In the past fifteen years, Argentina experienced two major and several minor droughts. By all standards, the most damaging droughts occurred during the 1988/89 and 1988/90 crop seasons when the country lost 15-20 percent of the total volume of grain.

China is also one of the world's leading agricultural countries, producing the largest portion of global grain and cotton, most of which is consumed domestically. From time to time, China also imports small amounts of agricultural commodities. However, in 1994, China unexpectedly purchased a huge volume of cotton, almost double the amount of their previous largest purchase. These imports were preceded by a cotton yield reduction three years in a row: 22% in 1992/93, 11% in 1993/94, and 7% in 1994/95 (the estimates were relative to the

average yield in the very productive 1990/91 and 1991/92 seasons (Kogan 1997; USDA 1994). The reduction in cotton production was attributed to unfavourable growing conditions, which caused vegetation stress in the main cotton-growing areas. The most severe vegetation stress (both moisture and thermal) occurred in 1992, which also showed the largest yield reduction. Some deterioration of vegetation conditions was also observed in 1994, but the drought-related stress was partially offset by summer rainfall. (Li & Lin 1993; Li**,** Chen & Huang 2000).

Australia was hit by the worst drought in a decade in 2002-2003 and the same drought was one of the most severe droughts in 100 years (Alston *et al.* 2004). The same writer conducted a research project on social impacts of 2002-2003 droughts in the Northern South West (NSW) region of Australia. According to his/her report, Australia incurred $2 billion as a result of the same drought. The numbers of sheep were reported to have dropped from 120 million to 100 million during this period. Other socio economic impacts that were reported in NSW will be briefly discussed as follows:

- The rate of economic growth was estimated to have dropped by 0.9 percent or $ 6.6 billion from what would otherwise have been achieved.
- It was also suggested that the GDP declined by 1.6 percent due to the impact of 2002-2003 drought.
- Lack of irrigation water has severely impacted on summer irrigated rice and cotton and specialist beef producer income dropped by 67 percent.
- In addition, fodder costs for beef producers increased from an average of $11,965 per farm in 2001-2002 to an estimated $19,318 per farm in 2002-2003. At the same time lamb exports were estimated to have fallen by six percent and beef exports by five percent.
- The net value of farm production for 2002-2003 was estimated to have dropped by 80 percent.
- The earnings from the farm exports were estimated to have dropped from $31billion in 2001-2002 to $25.9 billion in 2002-3 (Alston *et al.* 2004).

2.4 Socio economic impacts of drought in Southern Africa

The worse drought episodes in Southern Africa occurred from 1982-83 and from 1991-92 and were the most severe meteorological droughts of the 20th century over Southern Africa. During the 1991-92 droughts, 70 percent of crops failed and it was estimated that half of the population in the affected areas was at risk of malnutrition, other related health problems and even starvation (Buckland 1994).

During the 1991/92 drought in Southern Africa, the estimated total number of people affected was 86 million, 20 million of whom were considered to be at serious risk of starvation. Cereal output in SADC (excluding South Africa, not then part of the community) fell from an average of 11.3 million tons to 6.2 million tons. Import needs rose to 7 million tons, with a further 5.5 million tons for South Africa. In total, 11.4 million tons of cereal were imported. The drought in southern Africa in 1991/92 also had enduring effects and affected more than 1.3 million people, especially the rural poor of the southern and central zones. The impacts were exacerbated by the civil war and caused widespread loss of food supplies and livestock, and environmental degradation (Manjate 1997). The World Food Programme (WFP) alone spent nearly US$200 million in providing food aid relief. The southern province of Gaza is one of the most drought-prone as well as flood-prone provinces in the country because of its proximity to the Limpopo River and low-lying coastal areas.

Zimbabwe was affected by one of the worst droughts in the 1991/92 agricultural season, with complete failure of crops and devastation of the livestock sector that rendered most areas semi-deserts. The economic effects were also felt outside the agricultural sector. Largely as a result of that drought, manufacturing output in Zimbabwe declined by 9.3 percent, with a 25 percent reduction in volume of manufacturing output and 6 percent decline in foreign currency receipts (SADC-IUCN-ZRA-SARDC, 2000). In the period 1991-97, Zimbabwe experienced three major droughts requiring the importation of food to alleviate the associated food shortages. Serious reductions in agricultural output resulted in reduced economic growth and loss of the much-needed foreign exchange normally derived from agricultural exports.

Namibia suffered a substantial crop failure during the 1992/93 drought and that was manifested by a 71 percent drop in cereal production. Small farmers were reported to have been severely affected due to the fact that they depended almost entirely on their harvests for

staple food. The lack of rain in the rest of Namibia, especially in the west and the south, caused an alarming deterioration in the grazing situation and water availability and thousands of livestock deaths were reported. Estimated livestock mortality totalled 2,000 large stock units and 11,400 small stock units during December 1992 alone. Nationwide surveys conducted by the Ministry of Health and Social Services recorded a total of 75 deaths of children at Namibian hospitals and clinics from January to April 1993 and the loss of those children was a attributed to severe malnutrition as a result of drought (Devereux and Neraa 1996).

2.4.1 Effects of drought in South Africa

The 1991/92 drought had a very negative impact on commercial agriculture through reduced, rain dependent crop yield: reduced availability of water for irrigation; reduction in the capacity of range lands to support grazing; and lack of drinking water for livestock. The magnitude of 1991/92 drought can be illustrated as follows:

- According to Van Zyl (1993), SA needs 6.5 million tons of maize yearly. The crop estimate for 1992 was 2.4 million tons; only 1.4 million tons had been delivered to the Maize Board. Import costs were about R2.2 billion.
- The wheat crop was 1.2 million tons, which necessitated imports of one million tons at a cost of R550 million.
- Production of grain sorghum (1991-1992) was 95 000 tons while domestic consumption during this time totalled 283 000 tons.
- Production of sunflower seeds for 1991-1992 was 173 000 tons as against 589 000 tons in 1991-1992 and 559 000 tons in 1989-1990.
- The wool clip decreased from 101.7 million kilogram in 1991-1992 to 77.75 million kilogram
- The sugar crop dropped to 1.7 million tones from 2.3 million tones (Van Zyl 1993).

  During the same period**,** it was estimated that 50 000 jobs were lost in the agricultural sector, with a further 20 000 in related sectors, affecting about 250 000 people (AFRA 1993). Although the direct contribution of the agriculture sector to GDP is relatively small (about five percent), it still plays an important role in the economy through backward and forward linkages to other sectors (e.g. the purchase of goods such as fertilizers, chemicals and implements as well as the supply of raw materials to

industry). According to the Reserve Bank (Pretorius & Smal 1992) the loss to GDP during the 1992 drought was approximately 1.8 percent, representing US $500 million which is a substantial impact from a sector playing a relatively small role in the economy.

In January 2004, terms of reference for drought impact assessment were developed by the National Disaster Management Centre and the terms of reference were followed by the assessment to determine the extent of the impact of drought in the affected areas of the country (DoA 2004).

According to the report communicated to various departments by the Eastern Cape Provincial Disaster Management Centre (ECPDMC) in 2004, the terms of reference were structured as follows:

a) Objectives of the Assessment

- To determine the extent of the impact of drought in the affected areas of the country.
- To determine the kind of assistance required.
- To identify the implementing partners and ascertain capacity to implement the programme in each province.
- To establish effective delivery methods and mechanisms.

b) The Principles of the Assessment

- All affected sectors would be considered for assistance.
- The emergency relief programmes of all provinces would be linked with existing programmes of national departments.
- The programme would ensure accessibility of assistance to the targeted beneficiaries conducting the assessment.

c) Criteria for Assessment

- Rural households who could not produce their own food due to dry conditions, qualified for assistance.

- Ÿ Average number of people and average meal composition were used to determine the amount of assistance required per house hold.
- Ÿ Commercial and subsistence farmers affected by drought were to be assisted.

d) Methodology

- Ÿ Each department would co-ordinate with its provincial officers and extension officers to prepare themselves for the assessment.
- Ÿ Disaster management centres to co-ordinate with relevant departments and collate information and produce a consolidated report of the province.
- Ÿ Consultation with farmers associations, milling companies, community leaders, randomly selected community members and subsistence farmers (ECPDMC 2004).

e) Recommendations

- Ÿ R7 million would be required for the implementation of emergency stock and water supply in commercial areas.
- Ÿ R20 million was estimated for the drilling of 500 boreholes and procurement of equipment such as wind mills, distribution pipelines and drinking troughs. The estimated cost for one borehole was R40 000.
- Ÿ R10 million would be required for supply of emergency fodder supply in commercial areas.
- Ÿ R250 million would be required to purchase, transport and distribute fodder into the worse hit communal areas.
- Ÿ Owing to the failure of crops and the laying off of farm workers, a large number of people will be in desperate need of food. A food parcel scheme by the Department of Social Development had to be considered.
- Ÿ Subsidies to farmers were recommended to enable them to retain their workers and not lay them off as a result of drought EDAR (Eastern Cape Drought Assessment Report (2004).

The drought impact assessment was followed by the declaration of drought by President Mbeki for the six provinces of South Africa as stipulated under the background (DoA 2004). The declaration was followed by the allocation an amount of R250 million for drought relief

in all affected provinces as approved by the cabinet (ANDG DoA 2004). According to the deliberations of the meeting held in Dohne Agricultural Research Centre (DARC) in Stutterheim on 5 February 2004, it was revealed that the allocation of R250 million would be broken down as follows:

- 60 million was allocated for the provision of emergency relief to vulnerable community groups.
- R30 million was allocated for the provision of fodder for livestock to commercial and emerging farmers.
- R100 million for the provision of water for human consumption.
- R20m for livestock consumption.
- R5m for the maintenance of boreholes.
- R35 million for prevention of communicable diseases in poor rural communities (ARDDC 2004).

According to the National Director General of DoA (2004), out of R250 million that was allocated, a total of R20 million was set aside by the National Department of Agriculture (NDOA) for the drilling of boreholes in order to deal with water shortages in all provinces. All affected farmers who were within the jurisdiction of the declared areas would qualify for assistance. The assistance measures to secure drinking water on commercial land included the following:

a) The cleaning of boreholes that already existed qualified for assistance.

b) The drilling of new boreholes qualified for assistance.

c) The fitting of appropriate pumping equipment on the borehole drilled for emergency purposes qualified for assistance.

d) The purchase of a 5000 litre plastic tank would qualify for assistance provided that the reservoir was further than 500 meters away from the borehole drilled for emergency purposes.

e) Priority would be given to the farmers without any access to drinking water for stock/game and human needs.

f) The first drilling attempt would qualify for a rebate of 75% on the determined drilling tariff as stated in table 2. The first 150 meters would qualify for a rebate and thereafter normal tariffs would apply.

g) If the first attempt for drilling of the borehole was unsuccessful, application for a second drilling attempt would be made. A rebate of 50% for the second attempt would be applicable. The first 150 meters would qualify for a rebate and thereafter normal tariffs would apply.

h) Unsuccessful borehole was defined as a borehole with a tested yield of 450 liter/hour or less, or when water quality was too poor for water consumption.

i) Even though a rebate was payable on the third attempt, it was not seen as a priority.

j) A rebate of 75% with a maximum of R15 000 would be payable for water pumping equipment.

On the other hand, assistance measures to secure drinking water on communal land included the following:

a) The cleaning and refurbishment of existing boreholes qualified for assistance.

b) The drilling of new boreholes will qualify for assistance if the existing and refurbished boreholes do not satisfy the requirements.

c) The fitting of appropriate pumping equipment on the borehole drilled for emergency purposes qualified for assistance.

d) The installation of pipelines and other infrastructure to connect the water to existing stock watering systems would qualify for assistance.

e) Priority would be given to communities without any access to drinking for stock/game and human needs.

f) A request for each drilling attempt had to be authorised

Provinces could claim 100% of the costs for the supply of emergency water to communal areas from the fund established for that purpose (NDOA 2004). Among conditions, farmers had to adhere to the following:

a) No drilling would be allowed without permission from NDOA.

b) Application had to be supported by a water inventory that includes all water sources on the farm.

c) Applications would only be considered after an onsite inspection had been carried out by the local extension officer/qualified Geologist.

d) Government drills would be utilised where possible in communal areas and if not possible, private drilling contractors would have to be appointed (NDoA 2004).

Table 2.1 Drilling Costs of Boreholes for Farmers

Action	**Type of work**	**Drilling cost**
Drilling cost	Ordinary drilling	R132-00/meter
Work on existing boreholes	Pneumatic Percussion	R132-00/hour R220-00/hour
Casing	165mm dia 165mm dia perforated	R132-00/meter R179-00/meter

(Source: NDG 2004)

Apart from the above-mentioned government intervention, farmers were also supplied with emergency water which was calculated as follows:

- For large stock like cattle: 50 litres per livestock unit per day.
- For small stock: 5 litres per small stock unit per day.
- Human: 50 litres per day per head (NDG 2004).

2.4.2 Effects of drought in the Eastern Cape Province (ECP)

In the past 25 years, the Eastern Cape has suffered severe droughts that have devastated livestock (Xolisa & Asa 2008). The impact of drought in the Eastern Cape, particularly from 1983 to 2003, will be discussed briefly, but the impact of the 2004 drought will be discussed in more details under a separate subheading.

- **1983:** the biggest stock loss was in OR Tambo District Municipality where 1 183 livestock in Mqanduli area and 851 livestock in Mthatha area died from the effects of drought.
- **1984:** a large percentage of grass cover was reported to have died and it took three years for grazing to recover.
- **1987:** border farmers were reported to be struggling to cope with the effects of drought.
- **1989:** Port Elizabeth faced water rationing.

- **1990:** dam levels dropped and the average rainfall was 0.3mm and that was said to be the lowest level of rainfall ever recorded in the Eastern Cape Province.
- **1992:** the Eastern Cape was still in the grip of drought; Brible Drift dam 55.2 percent full and Nahoon dam 43 percent. The Wriggleswade dam was only 13.7 percent full.
- **1994:** former Transkei emerged from the grip of severe drought with losses estimated at R100 million.
- **1999:** drop in agricultural production was reported in Queenstown area.
- **2003:** drought hit the Sunshine Coast and that year was recorded as the driest year on record.
- **2004:** ECP was one of the six provinces that were declared disaster areas by President Thabo Mbeki in January 2004 (Other five provinces included Kwazulu-Natal, Free State, Mpumalanga, Northern Cape and North West). According to EDAR dated 7 January 2004, the following effects of drought were experienced in the Eastern Cape in 2004:

  a) Crops: very limited crops were planted in communal areas and food security was threatened due to reduced harvest.

  b) Veldt conditions: veldt fires had a detrimental effect on vegetation growth and that resulted in the malnutrition of livestock.

  c) In some areas stock water dams were empty, fountains dried up and the flow in rivers was very low. Large numbers of livestock were without water supply and had to travel long distances to look for drinking water. The negative impacts that have been mentioned above led to the development of the procedural guidelines for the disbursement of drought relief that was followed by the development of the general criteria and conditions for the provision of drought relief to farmers.

The guidelines, conditions and criteria for drought relief will be discussed in more detail under the following subheadings.

2.4.3 Procedural Guidelines for Disbursement of Drought Relief in South Africa

The goal of the relief measures was to provide relief to people who had been left destitute as a result of the 2004 drought. The provincial situational analysis reports were informing the decisions of the drought relief board. To provide relief to the affected people, the drought relief board was using the guidelines of the Fund Raising Act of 1978 (RSA 1978). The objectives of the Disaster Relief Fund Board (DRFB) were to provide assistance to organisations, people who suffered damages or losses as a result of drought induced disasters. The drought relief programme was guided by the following principles:

a) All affected people whose livelihood had been disrupted by the drought would be considered for relief.
b) This programme was also used to complete drought relief programmes of various departments.
c) The programme would ensure that the relief programme was accessible to all targeted beneficiaries.
d) The process of disbursing drought relief was expected to be expedited and efforts to ensure efficiency and effectiveness were to be made.

Commercial and subsistence farmers within the affected areas who had received assistance from other government departments such as department of agriculture and department of water affairs would not be considered for assistance by the board. The financial assistance was to be provided over three months to the affected families at R300 per month (NDSD 2004).

2.4.4 General Criteria and Conditions for Drought Relief Programme

On 19 February 2004, Provincial Drought Disaster Management Committee (PDDMC) meeting was held at Dohne Agricultural Research Centre (DARC) where it was revealed that an amount of R12.7 million would be allocated for drought relief in the ECP during the 2004/2005 financial year. The PDDMC agreed that a payment of at least R1 000 000 per affected district be made to assist the farmers in dealing with the effects of the 2004 drought (PDDMC 2004). By 4 March 2004, applications for 51 138 Livestock Units (LSU) had

already been received by the PDOA and it became clear that the allocated amount of R12.7 million would not be enough to service all the farmers. Subsequent to the allocated amount, the following general conditions and criteria for the provision of drought relief were developed:

a) For the purpose of 2004 Drought Relief Programme (DRP), a farmer was defined as a household that owns and farms livestock.

b) Independent households who share the same property, but have their own livestock were recognised as separate farmers (ECDoA 2004).

c) In terms of (DRP), livestock that was to be considered included only cattle, sheep and goats.

d) Only farmers registered under the DRP were eligible to receive benefits.

e) Although registration was a prerequisite for participating in the DRP, it was not a guarantee that drought relief would be granted.

f) DRP provided a 75% subsidy for the purchase and transportation of livestock feed. Farmers were not allowed to use the funds for any other purpose.

g) The payment of 75% subsidy was conditional to the farmers paying the supplier the first 25% of the feed and/or associated transport costs.

h) Payments were to be directed to the suppliers and not the individual farmers.

i) All suppliers of feed and transport were required to register as suppliers with the appointed administration office of the programme.

j) All participating farmers were to receive a subsidy up to the maximum of 30 Large Stock Units (LSU).

k) The prescribed value that was applied was R390 per LSU per month. That meant that government contribution would be R292.50 (75%) per LSU and the individual farmers would contribute R97.50 (25%) per LSU.

l) The prescribed value was subject to adjustment from time to time due to the price changes (ECDoA 2004).

Apart from the shortage of feed for the livestock, there were major water problems facing communities within ADM in 2004 and this became evident when the Municipal Manager applied for drought relief funding from the Department of Water Affairs and Forestry (DWAF). The application that was submitted encompassed information such as: details concerning population affected, including nature and

extent of water problems and the total cost estimates to solve the problems, were presented in a tabular format on the next page.

TABLE 2.2 Details of Drought Victims and the Financial Costs to Address Water Shortages.

LOCAL MUNICIPALITY	POPULATION AFFECTED	NATURE/EXTENT OF WATER PROBLEM	TOTAL COST ESTIMATES INCL. VAT
Mbhashe	125 000	Unequipped boreholes and contamination of perennial springs.	R1 902 900
Mnquma	85 000	Unequipped boreholes and contamination of perennial springs.	R1,200,600
Great Kei	20 000	Dry boreholes at Mooiplas water supply schemes.	R495,900
Ngqushwa	25 000	Unequipped boreholes and contamination of perennial springs.	R290,400
Amahlathi	35 000	Unequipped boreholes and contamination of perennial springs.	R1 002 600.00
Ngqushwa	25 000	Unequipped boreholes and contamination of perennial springs.	R290 400.00
Nkonkobe	15 000	Unequipped boreholes and contamination of perennial springs.	R1 104 300.00
Nxuba	10 000	Unequipped boreholes and contamination of perennial springs.	R495 900.00

(Source: ADM, 2004)

2.5 Drought Management Strategies

The FAO (2004) conducted research on drought impact mitigation and prevention in the Limpopo River Basin (LRB) and it is believed that strategies proposed in that paper will assist the readers to improve drought management strategies. Among others, proposed strategies mentioned by FAO include the following:

a) Investment in soil and water management, such as the improved development and management of fragile catchment areas and river basins, including small-scale irrigation.

b) Reviewing the appropriateness of current crop production patterns and possibilities in support of more intensified crop diversification policies.

c) Redirecting research towards more appropriate farming systems.

d) Improved rangeland and livestock management.

e) Reviewing institutional arrangements and physical infrastructure.

SADC (1999) supports FAO's view by stating that reducing long-term vulnerability to drought will require a fundamental shift in government approaches, especially towards a multidisciplinary approach in:

a) Promotion of drought-mitigating technologies and practices.

b) Poverty alleviation.

c) Creation of an enabling policy environment.

d) Adequate planning.

In the context of long-term socio-economic development, economic diversification is seen to be a major strategy element in drought mitigation (GOB–MFDP 1997). The same writer argues that the vulnerability of the rural areas to drought can be reduced through diversification of the rural economy, the expansion of non-farm employment opportunities in rural areas and improvements in agricultural efficiency, especially for smallholders.

2.6 Drought Mitigation Strategies

According to Hazeton *et al.* (1994), the real culprit responsible for the severe negative impacts of drought may not be the drought itself, but rather the socio-economic structures where the affected are situated. In support of this theory Solanes (1987) is of the opinion that for developing communities, drought is a problem that is often aggravated by the following reasons among others: poor infrastructure, poor economies, lack of access to technology and lack of institutional capabilities to deal with the drought. Therefore the only realistic long-term effective measure would be to change the socio-economic environment of the vulnerable community (Solanes 1986).

Hazelton *et al.* (1994) further emphasizes that the socio- economic framework should be developed to the extent that the communities involved are no longer so vulnerable to the impact of drought. To address all these challenges, Harald (1992) argues that there is an urgent need for drought planning and development of programmes to manage water resources. This view is also supported by Hazelton *et al.* (1994), when he identifies the need for the development of basic improved water supply systems for over 50% of the rural population of people of SA. In Hazelton's opinion, that would be a first step in dealing with the negative impact of drought. According to the same writer communities should take the initiatives of coming up with water projects if rural water supply is not sufficient.

According to the UNEP (2004), **c**oping with drought hazards can be enhanced further by developing strategies which adequately address the following questions:

a) How frequently or extensively does a certain type of drought occur in a given region?

b) What are the vulnerabilities and expected losses which are associated with the particular type of drought?

c) What are the costs of implementing the plausible strategies or options for mitigating the disaster that can be caused by that type of drought?

Such strategies aim at reducing the vulnerability of drought-prone communities by altering or strengthening their land use and farming practices or implementing programmes that promote water and food security to enhance poverty alleviation. The UNEP states that mitigation procedures and assessment procedures that can help to answer the above questions include the following:

a) Drought vulnerability and impact assessments.

b) Enhancing mechanisms for drought preparedness.

c) Capacity building and awareness creation in drought coping methods.

d) Enhancing coordination of drought response and recovery mechanisms.

On the other hand**,** Yevjevich (1983) proposes two types of strategies that can be used for the mitigation of drought impacts. They are:

a) Proactive measures.

b) Reactive measures.

Proactive approach involves pre-drought preparation of various measures and is intended to make the water users more resistant to water shortage and deficit of prolonged duration.

The second phase involves contingency plans undertaken during the ongoing droughts and relate to changes in water supply and water demand that decrease the impacts of drought (Hazelton 1994). According to the same writer, contingency plans should also include post-drought measures undertaken to minimize the spread of drought impacts beyond unavoidable geographic areas and their economic and social sectors involved.

(Wilhite & Wood 1994) and (Wilhite 1997a) argue that a critical component of planning for drought is the provision of timely and reliable climate information, including seasonal forecast that aids decision makers at all levels in making a critical management decision. According to the same writers, the impacts of drought and extreme climate events can be reduced if early warning information is effectively communicated.

Buchanan-Smith (1995) warns that although most drought-prone areas usually have their own EWS, it is also quite common to find a number of NGOs operating early warning system covering a particular district/ location where the NGO is working. Although it can be argued that the proliferation of EWS enables cross-checking in order to ensure more accuracy in disseminating early warning information.

On the other hand, the absence of a single early warning system bulletin providing a clear and consistent message is a hindrance to timely decision making, by government and other role players alike and that may delay response. To support Smith, Thompson *et al.* (1998), cited an example of an incident that occurred in Ethiopia in 1997 whereby two early warning messages were issued, but unfortunately they were contradicting each other. According to this writer, the National Meteorological Services Agency (NMSA) was warning of a higher probability of drought in the main rainy season of 1998, which Famine Early Warning System (FEWS) contradicted, saying that the probability of abnormal rainfall was only slightly changed from normal years and that confusion led to the delay in decision-making and response.

Thompson *et al*. (1998) indentify another problem that hinders the effectiveness of EWS and he refers to it as "*the wait and see attitude*". To support his argument, Thompson cited an example of the 1997 El Nino event in Ethiopia whereby the early warning information was provided and publicized early, but it encountered the attitude that "*we'll wait until something actually happens*". The danger of this attitude is that it encourages EW practitioners to bid up the severity of the crisis to attract attention, which may eventually backfire if the situation does not deteriorate to the catastrophic levels predicted. This can undermine the credibility of the EWS (Buchanan-Smith & Davies 1995).

Smith and Davies further identify political will as one of the most important factors that may contribute positively towards the use of early warning information in decision making. He again supported his argument by citing an example of the situation in Turkana whereby there were two episodes of drought. The first episode occurred from 1990-1991 and the EWS generated reliable early warning information and recommended a response. The District commissioner was supportive and donor/government relations were good at district level. In this instance, the political will to respond early was present, resources were made available and measures were taken to protect livelihoods before lives were threatened. The second episode occurred in 1992, but the situation was different although EWS was still in place.

It was different in the sense that at national level, the government was more concerned with preparations for the forthcoming multiparty elections. The District Commissioner in Turkana was not supportive of a rapid response and as a result the decision-making body, District Drought Management Committee, was paralysed. The relief operations started very late and there was acute food insecurity and human suffering (Buchanan-Smith & Davies 1995).

Wilhite (2000) also identifies media as one of the most powerful vehicles that can be used in disseminating early warning information. This was confirmed during the 1984 famine in Ethiopia whereby the famous BBC television played a significant role in disseminating EW information by exposing to the world the horrific famine that was unfolding and the international community's failure to respond in time. As a result of that, more energetic and increased response from many western donors was triggered.

Early warning systems currently used in SA include decile rainfall, Water Satisfaction Index (WSI), Normalised Difference Vegetation Index (NDVI) and other crop and rangeland-based models. As the face of agriculture changes, EWS will have to change to cope with the

greater variety of the crops, the greater scale at which the information is available and a greater focus on accurately reflecting the needs of small scale farmers (Wilhite 2000).

The main strategies for effective short-term and long-term drought mitigation are (ICARDA 1998):

a) Better targeting of crops and cultivars to specific agroecological environments.

b) Natural resources management adapted to the limitations of drought-prone areas, in particular crop management to increase water use efficiency, soil and water conservation, including water harvesting; and sustainable use of irrigation water.

c) Policy and institutional measures to facilitate implementation of drought mitigation practices, in particular the conservation and harvesting of water, shifts to more adapted crops, etc.

2.6.1 Drought mitigation strategies in Zimbabwe

Throughout the recent drought periods in Zimbabwe, the response by the Government of Zimbabwe (GOZ), local communities and authorities, as well as donors, have focused on short-term emergency response. Most local government authorities lacked the capacity to react to these disasters, let alone prepare for them in an effort to mitigate the possible impact of drought. After being hit by drought for many years, the GOZ realized the need to develop appropriate action plans to counter both the short-term and long-term effects of drought, to develop institutional capacity and to invest more resources in order to meet the needs of the most vulnerable population groups. To address these issues, the GOZ developed the National Policy on Drought Management (NPDM), which was formulated in 1998 and approved in 1999 (GOZ–NEPC 1999).

In order to achieve these objectives, the NPDM would be operationalized through a number of strategies including:

a) Facilitating sustainable management of natural resources.

b) Encouraging crop production only in those areas that are climatically and topographically suitable for particular crops, proper mechanical and biological

precautions versus soil loss, good land use practices through educational awareness campaign, and research into promotion of drought-tolerant food crops.

c) Ensuring correct stocking rates of domestic livestock and establishment of grazing schemes.

d) Supporting current policies and programmes on reforestation.

e) Ensuring and enforcing correct protection and management of water catchment areas, construction of more dams and sustainable exploitation of underground water.

f) Accelerating rural industrialization.

g) Promotion of small-scale enterprises.

h) Reducing land pressure through resettlement and proper land use practices.

i) Introducing appropriate water resources management and irrigation development schemes.

In addition to the above the GOZ has developed the following strategies to help poor families to cope with the effects of drought:

a) An improvement in water availability through the expansion of irrigation schemes, water harnessing by construction of dams and the equitable distribution of water for irrigation.

b) Promotion of intensive research on improving the tolerance of staple food crops to drought and diseases.

2.6.2 Drought mitigation strategies in Mozambique

According to Manjate (1997), in 1980 the government of Mozambique established the Department for the Prevention and Response to Natural Disasters (DPCCN) to take responsibility for providing humanitarian assistance and overall coordination in disaster response.

The DPCCN worked closely with provincial and local government structures, as well as donors and NGOs. The overall approach to disaster management in Mozambique has recently been reviewed. The DPCCN was restructured and renamed the National Disaster Management Institute (INGC) in 1999. The INGC was also scaled down to emphasize its role in planning and coordinating emergency prevention and response, rather than the actual

operational logistics of distributing aid (FAO 1998b). There is also a National Council for Disaster Management, comprised of higher-level ministerial staff from pertinent ministries. Although the government has acknowledged that the impacts of and response to disasters such as drought are related to the overall development of the country, there is no formal drought policy as yet. However, the formal policy guiding institutional arrangements for disaster management, including drought and the relationship with other national policies, is under review.

2.6.3 Drought mitigation strategies in South Africa

During the 1992 drought, a large number of NGOs and government departments launched the National Consultative Forum on Drought (NCFD) to coordinate a response to the drought crisis in the country (AFRA 1993). The objective of the NCFD was to ensure that relief reached the worst affected sectors and to improve the standard of the rural poor. According to (GOSA–MPACD 1999), the Disaster Management Act (RSA DMA 2002) brought a new perspective towards drought management. Unlike previous policies that focused mainly on relief and recovery efforts, Disaster Management Act (DMA) highlights the importance of preventing human, economic and property losses and avoiding environmental degradation. This new approach aims to:

a) Create an environment for effective disaster management.
b) Promote proactive disaster management through risk reduction programmes.
c) Improve the ability to manage disasters and their consequences.
d) Promote integrated and coordinated disaster management through partnerships with stakeholders and cooperative relations between government departments.
e) Ensure adequate financial arrangements.
f) Promote disaster management training and community awareness (RSA DMA 2002).

The responsibility for developing a national drought management strategy to slot into the national disaster management plan was assigned to the Department of Agriculture. A draft agriculture disaster management plan (GOSA–DOA 2003a) and a drought management strategy (GOSA–DOA 2003b) followed. The following priority areas and programmes were proposed for addressing drought and drought management:

a) Increased awareness and preparedness by way of a national drought plan.

b) Reduction of risk to droughts through appropriate research plans.

c) Establishment of mitigation plans.

d) Recovery and development programmes.

e) Implementation of education, training and information plans.

f) Risk management, with a strong emphasis on an insurance-based solution, which can be applicable to the agriculture sector as a whole.

In order to fulfil its role and responsibilities, the Department of Agriculture established the Directorate of Agricultural Risk and Disaster Management consisting of three sub directorates: one for information, policy and implementation; one for early warning; and one for post-disaster recovery and rehabilitation. The following measures are in the process of establishment:

a) An agricultural insurance bill: aimed at providing a system of agricultural insurance in order to improve the economic stability of agriculture, enhance the income of those farmers and producers most vulnerable to losses of agricultural crops and livestock from natural disasters, provide financial assistance, and control certain activities of agricultural insurers and intermediaries.

b) Approaches for an integrated risk management system: aimed at identifying, reducing and managing both natural and human-induced disaster risks (FAO 2004).

2.7 Drought Coping Strategies

Hazelton *et al.* (2004) conducted a research project on the development of drought response policy options for the cost-effective provision of water supply to rural communities subject to recurring droughts. According to the same writer, drought-coping strategies are composed of a mix of drought mitigation measures. Hazelton's theory is supported by Yevjevich *et al.* 1983) by stating that social system responses are made up of four drought control measures namely:

a) Supply measures, intended to increase available water quantities during drought.

b) Measures aimed at decreasing water demand through conservation.

c) Measures needed to mitigate impacts by reducing losses.

d) Methods able to produce strategies for management through mixes of drought control measures seeking optimum solutions in combating drought.

Hazelton *et al.* (2004) went further and classified drought mitigation measures into three groups, namely:

a) Supply oriented: are intended to augment supply during droughts. These measures can be divided into better use of existing water supplies; development of new water supplies; and use of unconventional approaches for increasing supplies.

b) Demand oriented: The basic objective is to control water use, provided legal economic and consent conditions permit it.

c) Minimisation of impacts and losses: these measures include proactive planning, spreading risks and losses over a large number of individuals, reduction of direct and indirect losses.

2.7.1 Supply Oriented Measures

a) Better Use of Existing Supplies:

- **Use of Surface Water Storage:** Surface water storage has been long recognised in South Africa as demonstrated by the large number of public dams of which there are over five hundred (Department of Water Affairs 1986). These are used to supply the Metropolitan areas, towns and commercial rural farming sector.
- **Use of Sub-Surface Water Storage:** It is only relatively recently that this source has been recognized as alternative source of water and already over 400 small and medium sized towns rely on ground water for their domestic supply (Morris 1993). Ground water was one of the major sources used through the drilling of boreholes and installation of hand pumps in 1992/93 drought.
- **Inter-Basin and Within-Basin Water Transfer and Exchange:** This can be done by transferring of water through conveyance lines. The transfer of water through conveyance lines is best illustrated by the emergency pumping of water from the Umsunduzi at Duzi and the Umngeni at Clermont to the Durban Heights Treatment Plant during the 1983 drought (Tayler 1985). The transfer of water via storage occurs when a series of reservoirs are constructed in a river system and the

surplus water stored in the upstream reservoirs is transferred during either inter-basin or within basin. There are a number of such systems in South Africa and the series of reservoirs in the Umngeni system is one of them.

b) Development of New Water Supplies during Droughts Periods

New supplies are measures that are not normally used in non-drought periods, but can be used or play a role in drought mitigation for example saltwater conversion. It involves construction of new surface reservoirs, further development or new development of ground water, new conveyance structures (Hazelton *et al.* 2004)

2.7.2 Demand Oriented Measures

Demand oriented measures can be divided into two groups namely, active and reactive demand-oriented measures. These measures will be discussed briefly under the following sub-headings:

a) Active Measures of Demand Reduction Involve the Following:

- **Legal restriction and public pressure:** During 1983/84 drought, certain restrictions were imposed by the city of Pietermaritzburg such as prohibiting use of hose pipes in washing motor vehicles, watering of gardens, use of sprinklers and these became more restrictive as the drought worsened and rationing was introduced (City Engineer of Durban 1985; Hobbs 1985).
- **Economic incentives:** This is based on economic incentives not to use water beyond a necessary minimum, or on the penalties in the case of exceeding an allocated amount. Tariff policies are useful in restraining demand when it is likely to outstrip resources.

b) Reactive measures involve the following:

- **Recycling systems:** Portable water recycling equipment of low investment can be used as a drought mitigation measure.
- **Impact minimisation measures**: These measures will be discussed briefly under the sub-bullets as follows:

- *Anticipation of drought*: Anticipation of drought involves drought forecasting, early warning measures and contingency measures.

- *Spread of risks and losses*: The spread of risks and losses in disasters may include taking drought insurance.

- *Individual Protection:* Savings in various forms by individuals or groups is another form of protection against drought. Diversification of activities is also another way of spreading risks and losses.

- *Disaster aid:* Disasters of specific impact attract relief and rehabilitation programmes by social and political necessities. This is a drought mitigation measure of spreading risks and losses across local, regional, national and international levels. These programmes take various forms such as grants, human subsistence aid, technical assistance and similar disaster aids. The problem resides with the proper selection of such a mix of disaster aid that fits the general and specific conditions of each drought and each area covered.

- *Agricultural adjustments:* A mix of drought tolerant/resistant and common crops and/or livestock represents a spread in risks and losses. Water conservation practices are also drought mitigation measures.

2.8 Drought Monitoring Methods

Wilhite (2000) noted that it is difficult to determine the onset, development and end of drought because of its creepy nature and he emphasized the importance of developing comprehensive monitoring methods. Wilhite believes that by using this method status of drought can be monitored constantly to provide information to all drought response agencies. Drought losses can be determined quickly and precisely for large areas and this information will facilitate response and recovery operations. According to the same writer, the following drought monitoring methods are available:

a) Decile Rainfall

Decile rainfall analysis is valuable because it is spatially comparable. In other words it can be used to compare areas that have very different rainfall patterns, as in South Africa.

b) Water Satisfaction Index (WSI)

This method was developed by Frère and Popov (1979) and used by Vossen (1990) in Botswana. The index has been applied spatially across South Africa using WindDisp and ArcView softwares. The WindDisp version of the product has been developed to provide additional useful information such as planting date, soil moisture status and irrigation. Du Pisani (1990) noted that:

- WSI does not consider crop- or stage-specific sensitivity to drought stress;
- It only takes account of cumulative moisture deficits, not consecutive deficits;
- It can only partly accommodate actual evapotranspiration;
- The model assumes equal soil moisture availability over the entire range between field capacity and wilting point.
-

c) Normalised Difference Vegetation Index (NDVI)

The NDVI assists in analysing the vegetation status in South Africa.

d) Simple Mathematical Model

Venter (1992) developed a simple mathematical model (ZA model) using monthly precipitation to characterize Karoo shrub land (semi-arid vegetation). This model provides an effective representation of shrub water status. The application of the model is limited to the dry western portions of the country.

e) PUTU Veld Production Model

This model is used create images of expected rangeland conditions for the Free State province.

f) Free State Agricultural Conditions

Agricultural conditions are provided for the Free State province. Recent rainfall, expected rainfall, crop estimates and agricultural produce price trends are included. In

addition to the web access, about 200 individuals and organizations receive the information via e-mail.

g) Remote Sensing Method

The remote sensing method of drought monitoring will primarily track crop growth, status of soil moisture, evapotranspiration, status of the hydrological system and precipitation. Remote sensing method combined with station observations can monitor the formation and development of drought objectively, quickly and economically for large areas.

2.9 Conclusion

Apart from the fact that the agricultural sector is contributing very little to the South African economy, the detrimental effects of drought should not be underestimated.

It became evident from the above discussion that thousands of jobs are lost and people's lives are put at stake as a result of malnutrition when drought occurs. The government should move away from being reactive towards a more proactive approach. If drought planning can be improved, thousands of Rands that are being used to provide drought relief can be channelled towards improving the resilience of communities to natural disasters, particularly farmers.

CHAPTER 3: RESEARCH RESULTS

3. Introduction

This chapter will focus on the overall analysis of the research results for the Nkonkobe area as a whole. All the questions covered during the interview stage will be analysed briefly but more attention will be given to those that will contribute more towards answering the research questions. The researcher will justify his research results by making reference to the literature study and by getting more information from the new sources whenever possible.

The feelings of the farmers about the socio economic impact of drought will also be shared with the readers in order to give them an opportunity to do their own assessment of the impact of drought on the emotions of the people.

The last part of this chapter will focus on the comparison of the three areas of Nkonkobe. Only the questions where major differences between the areas were identified will be compared against one another. The areas of difference that will be discussed were identified as follows: types of farms, levels of agricultural training, alternative sources of income during 2004 drought, and service delivery expectations of different areas during the 2004 drought.

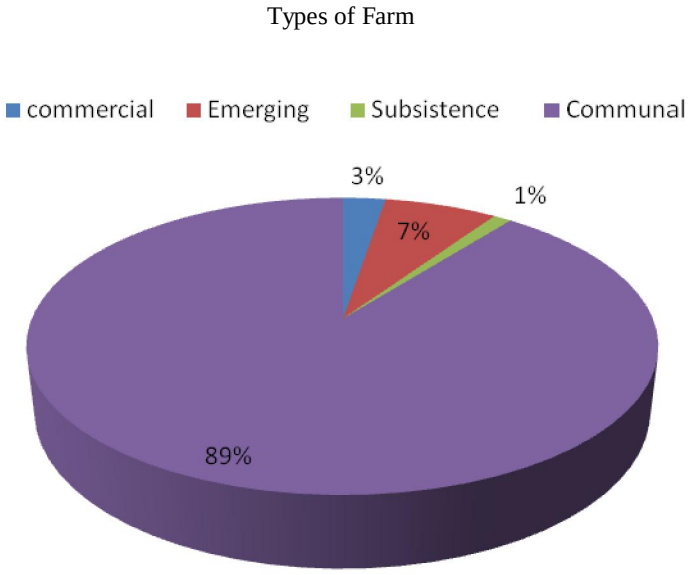

Figure 4 Percentage of Types of Farms in Nkonkobe Area.

Large numbers of farmers in Nkonkobe Municipality are communal farmers (89%) and the second largest number is that of emerging famers, seven percent. Commercial farmers only add up to three percent and subsistence farming is only one percent.

This was confirmed by Nowers (2008) when he stated that the Eastern Cape Province is where communal farming is practised on the largest scale.

Table 3.1 Frequency and Percentage in Terms of Ownership

Farm ownership	**Frequency**	**Percentage**
Own farm	126	66.7%
Lease	3	1.6%
Communal	32	16.9%
Parents	23	12.2%

Table 3 shows that 12.2 % of the respondents were not farm owners; they were children answering the questionnaire on behalf of their parents. There is no guarantee that these children share the same views as their parents in terms of the socio economic impact of drought. However, it is believed that the credibility of the study was not compromised since the majority of respondents were owners.

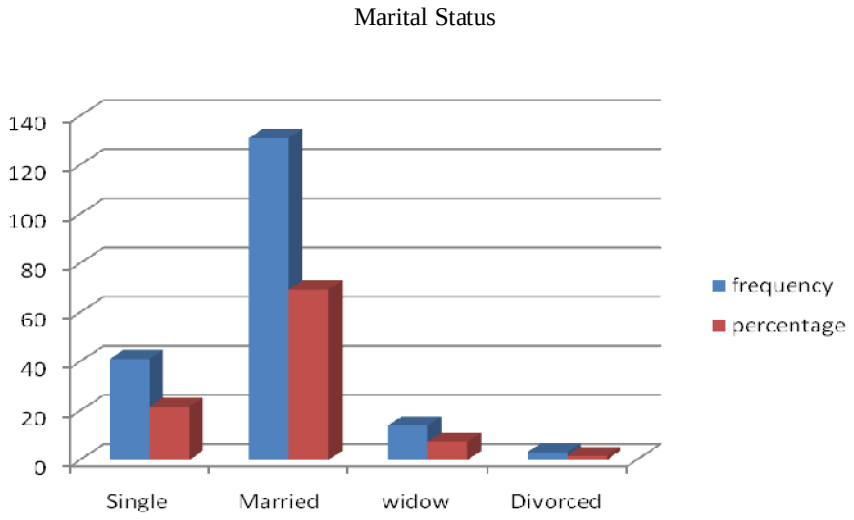

Figure 5 Marital Status in Nkonkobe Farms

The majority of farm owners in Nkonkobe Municipality are married (69.3%) and the second biggest number is that of single farmers (21.7%). The official records reveal that Nkonkobe economy is currently able to create jobs for only 3.5% of the economically active population (Nkonkobe IDP Review 2006/2007).

The high unemployment rate is a big challenge for a municipality whose livelihood is mainly dependent on agricultural production. Owing to the economic challenges that have been mentioned above, the majority of parents may not be able to provide financial support for their families as a result of drought. The unemployment rate in Nkonkobe Municipality was 62% in 1996, 66.4% in 2001 and during the 2004 drought it increased further to 67.6% (ADM IDP 2006/2007).

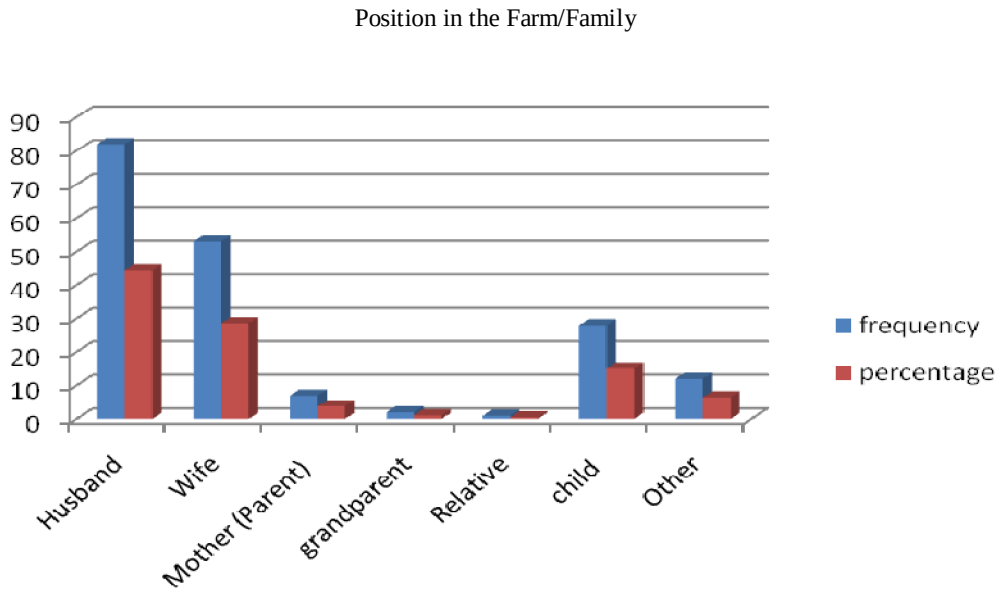

Figure 6 Position of Respondents within the Farm Family

As it was explained under sampling that the total number of farmers that were visited in Nkonkobe were 189 and 72.9% (43.3% husbands + 28.6% wives) of them were owners while the other 27.1% were family members that were representing the farm owners. For the owners 44.3% were men (husbands) and 28.6% were women (wives). According to the NLM IDP (2006/2007), about 40% of the total population of Nkonkobe are males whilst the remaining 60% are women.

It seems that although females are dominating the population of Nkonkobe, their participation in farming is minimal (NLM IDP 2005/2006). When it comes to the farm ownership, males dominate.

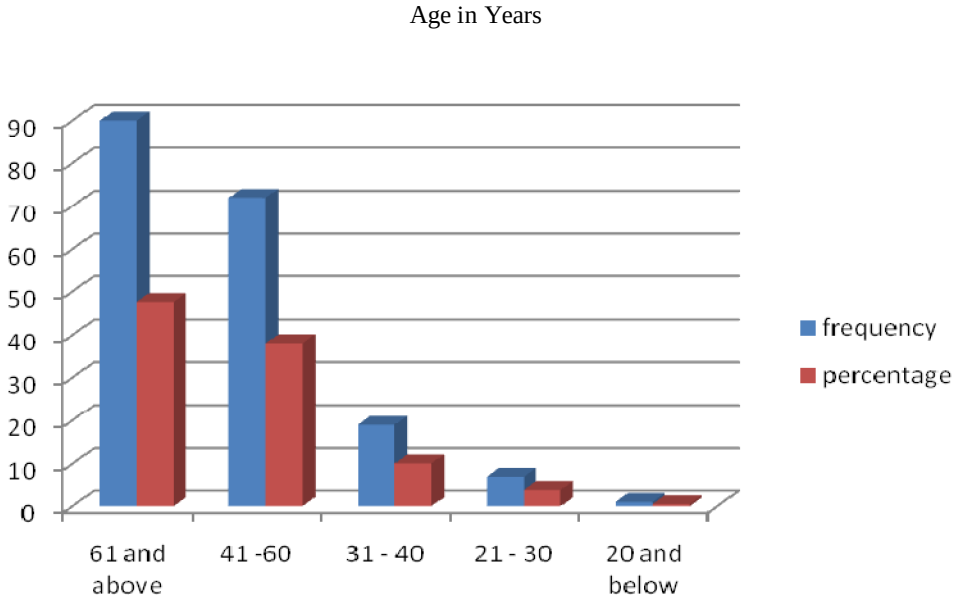

Figure 7 Dominant Age in Farm Ownership

Figure 7 illustrates that the majority of farm owners (47.6%) in Nkonkobe Municipality are 61 years of age and above and 38.1% is comprised of the middle age group (41-60). According to NLM IDP (2004/2005), the most dominant age bracket in the Nkonkobe Municipal area is age ranging from 25 years to 35 years. This age range falls within the statutory definition of young people.

If the large number of the population is young people and the large number of farm owners are old people that means more young people should be encouraged by government to consider farming as a career so that the South African economy can be revived (NLM IDP 2008/2009).

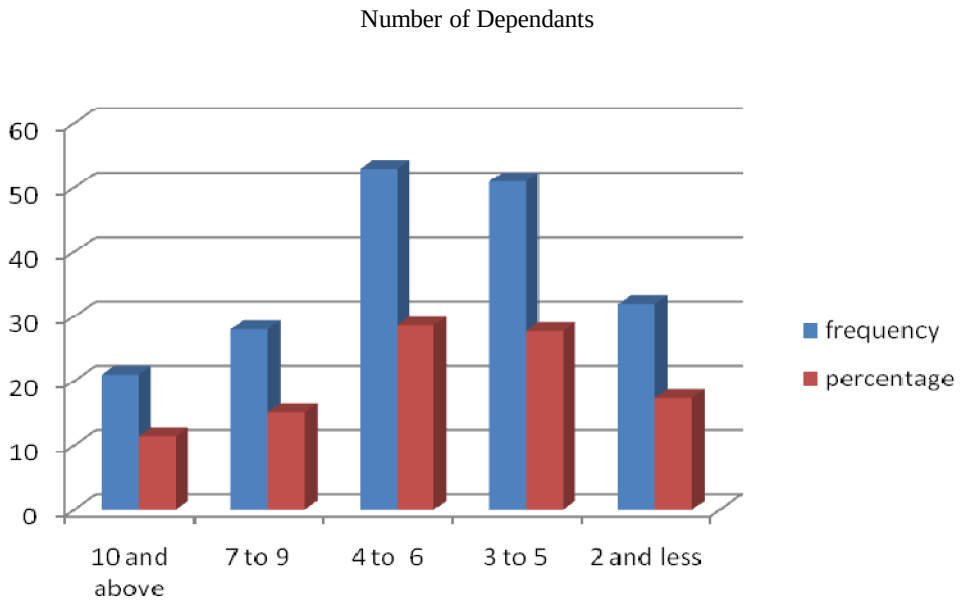

Figure 8 Number of Dependents for Each Farm Owner

The 53 farm owners (28.6%) of Nkonkobe had four to six dependents while 51 farm owners (27.3%) had three to five dependents. Therefore 56.32% of farm owners (28.6% + 27.7%) had three to six dependents in 2004 which was a high number considering that there was a drought and unemployment rate was at 67.6% (ADM IDP 2006/2007).

Table 3.2 Percentage of Ethnic Group

Ethnic group	**Frequency**	**Percentage**
Xhosa	188	99.5%
Afrikaans	1	0.5%

The above table illustrate that 99.5 percent of farmers are Africans while only 0.5 percent represent coloured and white communities. This is confirmed by NLM IDP (2006/2007) where it is stated that the dominating group in about twelve wards of Nkonkobe area are Africans which account for about 95% of the population in Nkonkobe (NLM IDP 2006/2007).

Highest Standard of Education

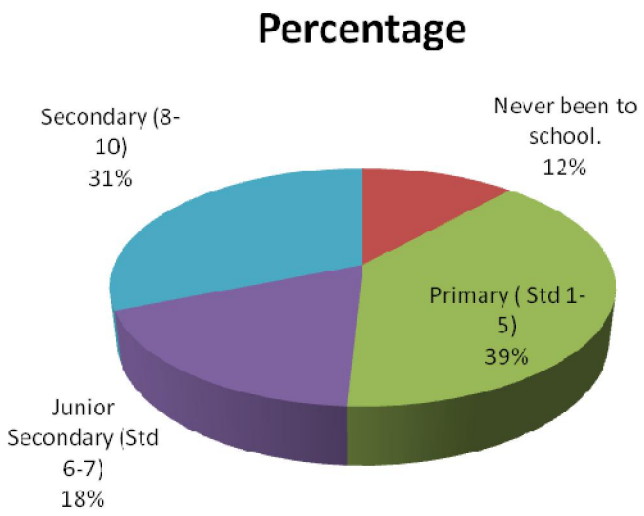

Figure 9 Level of Education in Nkonkobe

The above pie chart shows that only 12% of farmers in Nkonkobe area have never been to school whilst 78% of them are literate.

This is confirmed by NLM IDP (2006/2007) where it states that in terms of literacy rate, Nkonkobe is one of the highest in the ADM area and boasts a 61% literacy rate (NLM IDP 2006/2007).

Table 3.3 Percentage of Agricultural Training in Nkonkobe

Have you undergone agricultural training?	**Frequency**	**Percentage**
Yes	28	14.9%
No	160	85.1%

Apart from the impressive literacy rate in Nkonkobe, only 28 farm owners (14.9%) out of 180 have undergone agricultural training whilst 85% do not have training. This is surprising because there are educational institutions in Nkonkobe that offer agricultural training

amongst other courses; these institutions include University of Fort Hare, Lovedale College and Healdtown (NLM IDP 2006/2007).

Table 3.4 Courses of Agricultural Training Attended

Level of agricultural training	Frequency	Percentage
Short course (Less than 1 year	22	73.3%
certificate (1 year)	2	6.7%
Diploma	2	6.7%
University Degree	1	0.5%
Other	3	10%

The 22 farmers out of the trained 28 have done a short course of less than a year whilst only a small percentage have done the full training as indicated by the table above.

Table 3.5 Different Reasons Mentioned for not Undergoing Agricultural Training

Reason For Not Undergoing Agricultural Training	Frequency	Percentage
Could not afford it	76	47.5%
Did not think about it	63	39.4%
Were not interested	14	8.8%
other	7	4.4%

The majority of farmers 47.5% could not afford to pay for training and 39% did not think about it. That can be attributed to the high levels of poverty rate in Nkonkobe, particularly during the period starting from 1996 to 2004. It is common for poor communities to have low levels of post matriculation qualifications because they usually do not have funds to further their studies and they worry most about where the next meal will come from. According to ADM IDP (2006/2007), the percentage of people living in poverty in Nkonkobe Municipality has increased from 59.9% in 1996 to 71% during the 2004 drought period. That means the

poverty rate in Nkonkobe was high since 1996 and it has worsened during the 2004 drought period (ADM IDP 2006/2007).

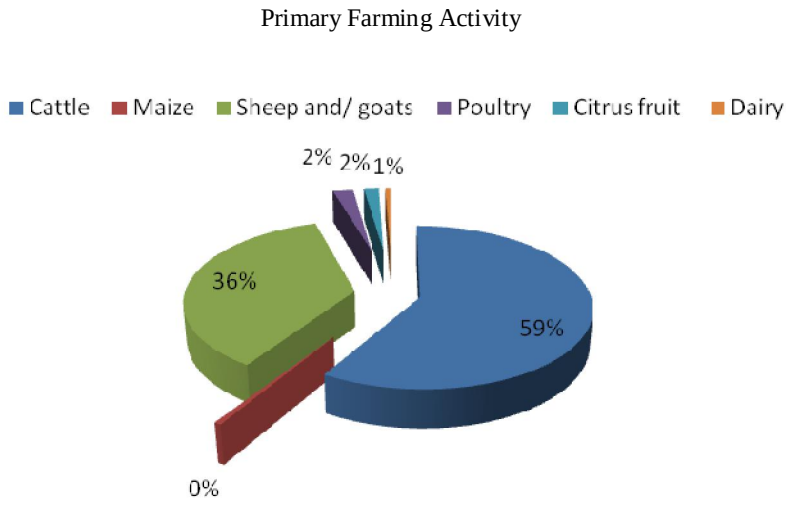

Figure 10 Percentage of Primary Farming Activities

The majority of farm owners in Nkonkobe rely on livestock (cattle, sheep and goats) as a primary farming activity. This is confirmed by the fact that the Eastern Cape Province (ECP) has the biggest cattle and sheep herds in South Africa (Nowers 2008).

Table 3.6 Selling of Primary Products

Sale Of Primary Products	**Frequency**	**Percentage**
Direct to the public	125	67.6%
Local fresh produce market	4	2.2%
Direct to the market/*stokvels*	31	16.8%
other	25	13.5%

The highest percentage of farmers (67.6%) of Nkonkobe sells their primary products to the public and it must be noted that those transactions are not considered when the GDP is calculated. Subsequent to that, despite the high agricultural production potential, particularly in livestock, agriculture continues to contribute only three percent towards the economy of

ADM (ADM IDP 2006/2007). This can be attributed to the fact that only a small percentage of farmers (16.8%) sell their primary products directly to the market.

Table 3.7 Profit from Primary Farming Activities

Annual Profit From Primary Farming Activity	**Frequency**	**Percentage**
Less than R20 000	158	90.8%
R20 000 – R29 000	7	4%
R30 000 – R39 000	5	2.9%
R60 000 – R69 000	2	1.1%
R100 000 and above	2	1.1%

More than 90% of farmers in Nkonkobe Municipality were making a profit of less than 20 000 per year in 2004 which was nothing considering that 56.32% of farm owners had three to six dependents in 2004 (refer to figure 8).

According to Raat (2008), small scale farmers of the Eastern Cape Province generally make a net profit of R10 000 per year which translates into R50 for 200 days and that means they have zero income for the year.

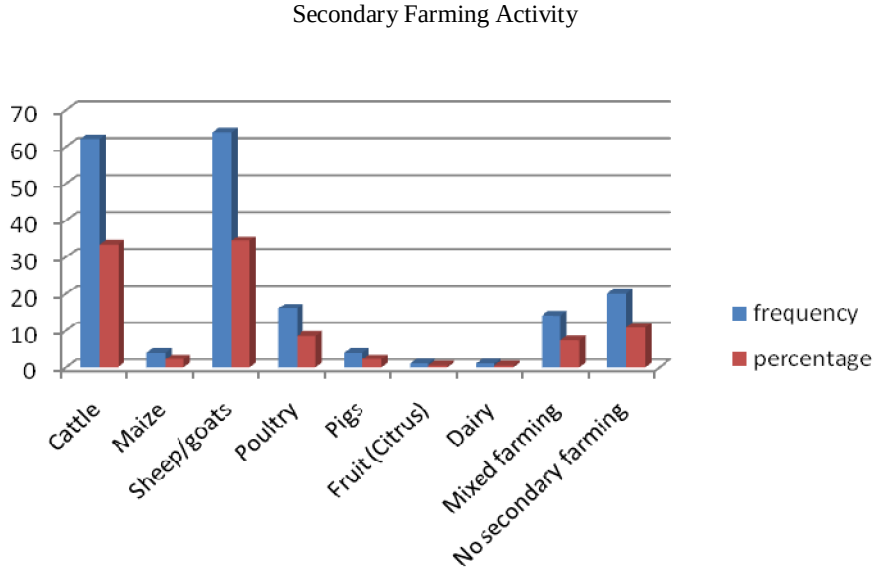

Figure 11 Types of Secondary Farming Activity

More than 34 % of farm owners rely on sheep and/or goats as their secondary farming activity and cattle occupy the second largest secondary farming activity at 33.3%. This is supported by the fact that Eastern Cape Province (ECP) has the biggest cattle and sheep herds in South Africa (Nowers 2008).

Table 3.8 Profit from Secondary Farming Activites

Annual Profit In Rands	**Frequency**	**Percentage**
No profit	55	31.1%
Less than R20 000	115	65%
R20 000- R29 000	3	1.7%
R30 000 – R39 000	2	1.1%

More than 30 percent of farmers do not have a primary farming activity and it is common knowledge that the impact of drought will be greater on these farmers because they do not have alternative means of income.

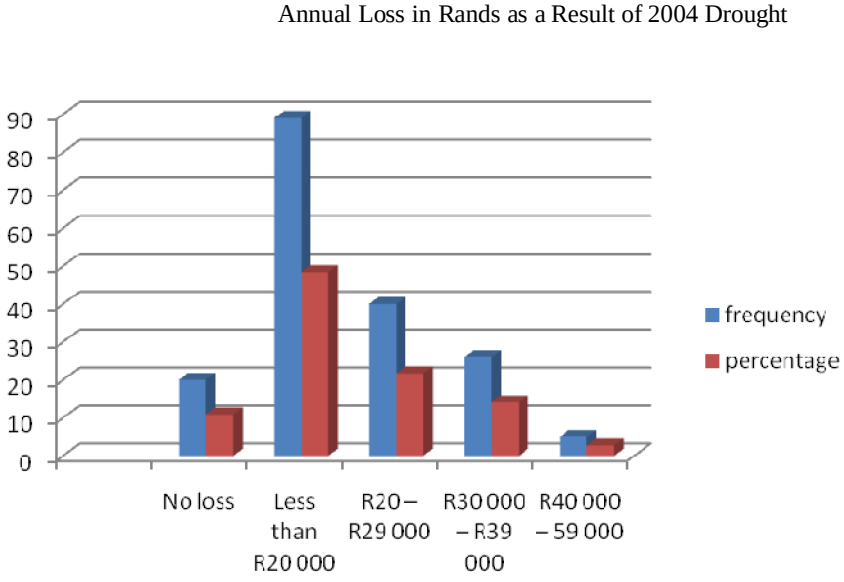

Figure 12 Losses during 2004 Drought Period

In question 1.3.14 the indication was that 90.8% of Nkonkobe farm owners make a profit of less than R20 000 and the above table indicates that 90 farmers out of 180 lost an amount

close to R20 000 which was a lot of money for farmers whose profit is also less than R20 000 per annum (Raat 2008).

The loss incurred by farmers was confirmed by the fact that 1063 farmers from thirteen wards of NLM submitted claims for drought relief as a result of the 2004 drought (ADM 2004).

Alternative Source of Income during 2004 Drought

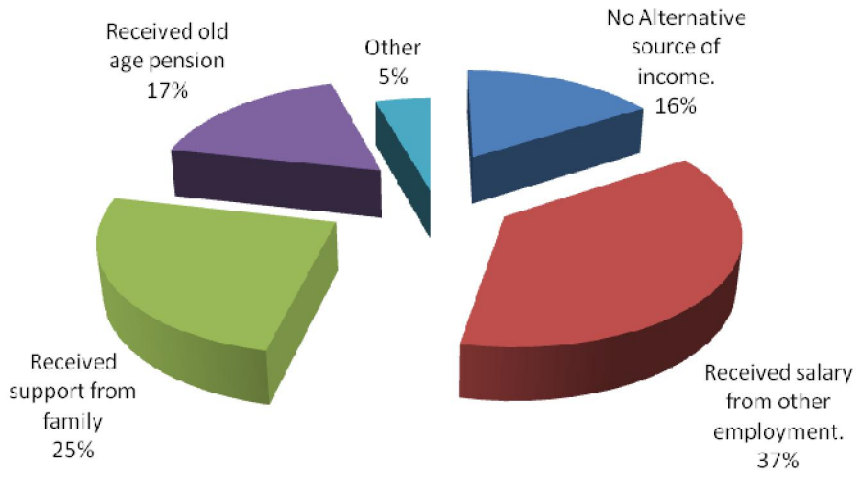

Figure 13 Percentage of Alternative Sources of Income

The fact that the majority of farmers (37%) in Nkonkobe received salary from other employment does not mean the impact of the 2004 drought should be underestimated because, according to NLM IDP(2007-2012), the income level of people in Nkonkobe Municipal area was extremely low with 93% of the people earning less than R800 in 2004. Therefore the alternative source of income that farmers were receiving did not improve the situation and that was also confirmed by the increase of the number of people living in poverty from 55.9% to 71% during the same period (ADM IDP 2006/2007).

Table 3.9 Number of Farmers with Insurance Against Drought

Drought Insurance	**Frequency**	**Percentage**
Yes	3	1.6%
No	185	98.4%

The high percentage of uninsured farmers is a cause for concern because it means that government will continue to spend large amounts of money on drought relief.

According to the deliberations of the meeting held in Dohne Agricultural Research Centre (DARC) in Stutterheim on the 5 February 2004, it was revealed that the cabinet had decided to allocate an amount of R250 million due to the continuing impact of the 2004 drought in parts of the country (ARDDC 2004).

Table 3.10 Reasons for not Having Insurance against Drought

Drought Insurance	**Frequency**	**Percentage**
Could not afford it	102	55.1%
Did not think about it	76	41.1%
Was not willing to take it	2	1.1%
Other	5	2.7%

The highest percentage (55.1%) in this category consists of farmers who did not have drought insurance and 41.1 % who did not think about taking insurance at all. This can be attributed to the high poverty rate in Nkonkobe during that period.

Table 3.11 Number of People Employed in the Farm in 2004

Number Of Employees	**Frequency**	**Percentage**
20 and above	3	1.6%
10 - 19	5	2.7%
5-9	1	0.5%
3-5	7	3.8%
2 and less	21	11.5%
No employees	146	79.8%

According to the above table, 79.8% of farm owners did not have any employees whilst 11.5% of the farm owners had two employees and less. This can be attributed to the fact that

a large percentage of farmers in the Eastern Cape are communal farmers whose profit per annum is in range of R10 000 (refer to table 9).

Table 3.12 Number of Employees Retrenched in Drought of 2004

Number of employees retrenched	Frequency	Percentage
10- 19	3	30%
3 -5	2	20%
2 and less	5	50%

Only ten farmers responded to this question and that is not surprising because 79.8 percent of farm owners did not have any employees. Out of ten respondents, 100% admitted that they laid off their employees during the 2004 drought period. Although 50% of the respondents had two employees and less, the increase in unemployment rate in Nkonkobe was noticeable because it has increased from 64.4% in 2001 to 67.6% in 2004. This is attributable to the fact that drought does not only affect farmers, it affects related sectors as well for example Chemical industries (Van Zyl 1993).

To support the above statement AFRA (1993) argues that approximately 50 000 jobs were lost in the agricultural sector, with a further 20 000 in related sectors, affecting about 250 000 people in South Africa during 1991/1992 drought period (AFRA 1993).

Table 3.13 Number of Farmers with Drought Plans and Mitigation Strategies in Nkonkobe During 2004

Drought Plans/Mitigation Strategies	Frequency	Percentage
Yes	11	5.9%
No	174	94.1%

The fact that 94.1% did not have drought plans from 2004 to the present is a cause for concern and it also explains why Nkonkobe Municipality farmers were severely affected by the 2004 drought. This is supported by Lindell and Prater (2003), when they argue that physical impact of a disaster is determined by the hazard mitigation practices and emergency

preparedness practices of the affected community. Their argument gives rise to a question, "*Do Nkonkobe farmers know how to develop drought plans?"* The next paragraph will attempt to answer this question.

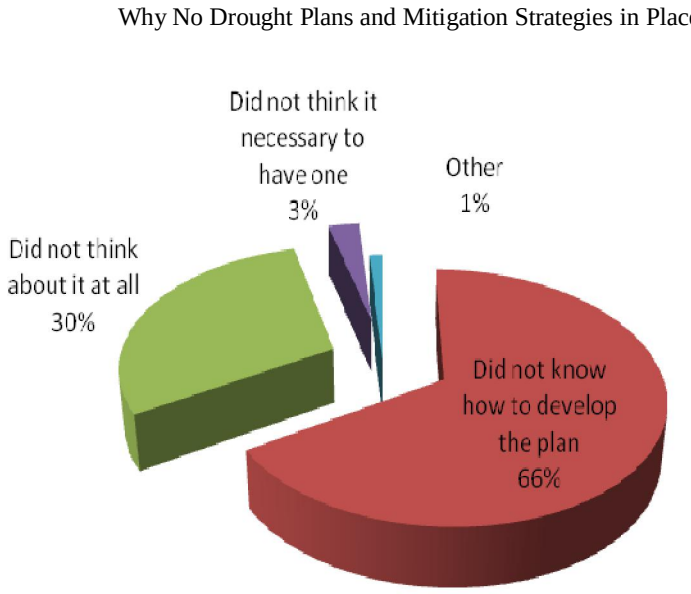

Figure 14 Reasons for not Having Drought Plans and Mitigation Strategies

A total number of farmers who do not know how to develop drought plans, amount to 66% whilst 30% did not think about developing drought plans and/or mitigation strategies.

The fact that only 28 farm owners (14.9%) out of 180 have undergone agricultural training whilst 85% do not have training might have played a role in increasing the number of farmers who do not know how to develop drought plans. This is surprising because of the availability of institutions in Nkonkobe that offer agricultural training like the University of Fort Hare, Lovedale College and Healdtown (NLM IDP 2006/2007).

Hazelton *et al.* (1994) argue that the real culprit responsible for the severe negative impacts of drought may not be the drought itself, but rather the socio-economic environment of the affected people. To address all these challenges, Harald (1992), argues that there is an urgent need for the development of drought planning programmes to educate the communities on how best they can mitigate the impact of drought.

Table 13.14 Assessment of Government Intervention

Did The Government Do Enough To Assist The Farmers?	Frequency	Percentage
Yes	26	14%
No	158	84.9%

According to 84.9% of Nkonkobe farm owners, the government did not do enough to assist them during 2004 drought period.

This feedback is surprising because minutes of the meeting held in Dohne agricultural research centre in Stutterheim on the 5February 2004, revealed that there was an allocation of R250 million for drought relief in South Africa in 2004. The allocation was broken down as follows:

- 60 million was allocated for the provision of emergency relief to vulnerable community groups.
- R30 million was allocated for the provision of fodder for livestock to commercial and emerging farmers.
- R100 million for the provision of water for human consumption, R20m for livestock consumption and R5m for the maintenance of boreholes.
- R35 million for prevention of communicable diseases in poor rural communities (ARDDC 2004).

On 19 February 2004 a PDDMC meeting was held at the DARC where it was revealed that an amount of R12.7 million would be allocated for drought relief in the Eastern Cape Province (ECP) during 2004/2005 financial year. The PDDMC agreed that a payment of at least R1 000 000 per affected district be made to assist the farmers in dealing with the effects of 2004 drought. By 4 March 2004, applications for 51 138 Livestock Units (LSU) had already been received by the PDOA and it became clear that the allocated amount of R12.7 million would not be enough to service all the farmers (PDDMC 2004).

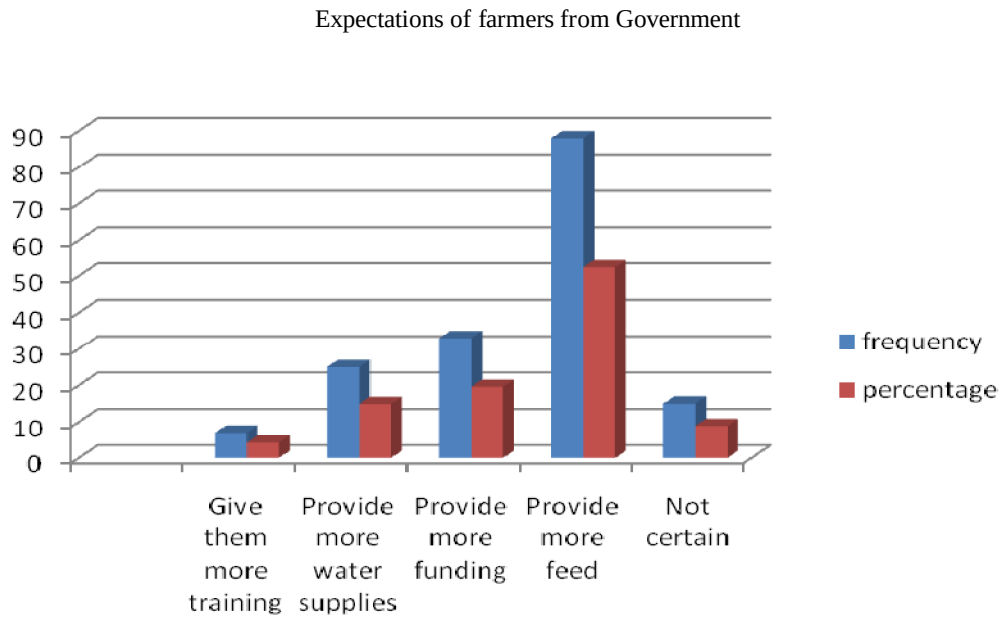

Figure 15 Service Delivery Expectations of Farmers

The expectations of 52.4% of farm owners are that government should provide more feed for their livestock during drought periods, 19.6% prefer to be given funding to procure feed and medication for their livestock during drought periods and 14.9% want the government to provide more water supplies in order to overcome water shortages during drought periods in their areas. It is a concern that only 4.2 percent of farmers are interested in agricultural training considering that the majority of farmers do not know how to develop drought plans.

On 4 March 2004, applications for 51 138 Livestock Units (LSU) were received by the PDOA and it became clear that the allocated amount of R12.7 million would not be enough to service all the farmers (PDDMC 2004).

Apart from the shortage of feed for the livestock, there were major water shortage problems facing communities within ADM in 2004 including Nkonkobe Municipality and that became evident when ADM submitted an application of R1 104 300 to DWAF for the construction and repair of water supplies in Nkonkobe area (ADM 2004).

The small percentage of people who are in need of more water supplies suggest that the Department of Agriculture and DWAF are on the right track in terms of addressing the problems of shortage of water supplies.

Table 3.15 Shows Main Source of Drinking Water during 2004 Drought

What Was Your Main Source Of Water In 2004?	Frequency	Percentage
Dams	45	24.4%
River	95	51.1%
Running water in the house	1	0.5%
Communal tap	22	11.8%
Boreholes/wind-mills	17	9.1%
Other	6	3.2%

The fact that 75.5% of farmers were drinking from open water supplies (51.1% from rivers + 24.4% from dams) in 2004, is a cause for concern because untreated water can result in major health problems. It will be discussed later whether the health status of people in Nkonkobe was affected or not in 2004.

However, the situation seems to have improved at present because water services authority was taken from Local Municipalities (LMs) to Amathole District Municipality (ADM) due to the better capacity that ADM has in terms of providing drinking water of high quality (ADM IDP 2006/2007). This improvement in water provision was also observed by the researcher when Nkonkobe municipality was visited.

Table 3.16 Number of Cattle Owned by Farmers before 2004.

Number of cattle owned before 2004 drought	Frequency	Percentage
100 and above	5	2.7%
80 - 99	1	0.5%
60- 79	1	0.5%
40 - 59	13	7.1%
20 - 39	53	28.8%
19 and less	102	55.4%
Did not own cattle	9	4.9%

The number of farm owners who owned between 1-19 cattle was the highest before 2004 drought at 55.4% and only five farmers out of 182 owned 100 cattle and above. This will be analysed further under the next sub-heading.

Table 3.17 Number of Cattle Lost by Farmers after 2004 Drought.

Number of cattle lost after 2004 drought	Frequency	Percentage
60- 79	3	1.6%
40 - 59	2	1.1%
20 - 39	17	9.3%
19 and less	140	76.9%
Did not lose cattle	20	11%

According to the above table, the percentage of farmers who lost between 1 and 19 cattle were 79.9%. This was a major impact because 54.4% of Nkonkobe farmers owned between 1 and 19 cattle which means they almost lost all of their cattle.

It is worth noting that Drought Relief Programme (DRP) provided 75% subsidy for the purchase and transportation of livestock feed and farmers were not allowed to use the funds for any other purpose. The payment of 75% subsidy was conditional to the farmers paying the supplier 25% of the total cost of feed including the associated transport costs (ECDoA 2004).

Table 3.18 Sheep and/or Goats Owned by Farmers before 2004 Drought.

Number of sheep and/goats owned by farmers before 2004 drought	Frequency	Percentage
100 and above	10	5.7%
80 – 99	6	3.4%
60- 79	6	3.4%
40 – 59	12	6.8%
20 – 39	49	27.8%
19 and fewer	67	38.1%
Did not own sheep and/goats	26	14.8%

The number of farm owners who owned between 1-19 sheep and/or goats was the highest before 2004 drought at 38.1% and only ten farmers out of 176 owned up to 100 sheep and/or goats. This will be discussed in detail under the next sub-heading.

Table 3.19 Sheep and/or Goats Lost by Farmers before 2004 Drought.

Number of sheep and/ goats lost as result of 2004 drought	**Frequency**	**Percentage**
100 and above	1	0.6%
80 – 99	2	1.1%
60- 79	7	4%
40 – 59	2	1.1%
20 – 39	25	14.3%
19 and less	104	59.4%
Did not lose any sheep and/goats	34	19.4%

According to the above table, the percentage of farmers who lost between 1 and 19 sheep and/or goats was 59.4%. This had a major impact because 38.1% of Nkonkobe farmers owned between 1 and 19 sheep and/or goats which meant they almost lost all of their livestock.

This is confirmed by the fact that 1063 farmers from thirteen wards of NLM submitted applications for drought relief in the form of feed for their livestock as a result of the 2004 drought (ADM 2004).

Impact of 2004 Drought on Educational Access

Figure 16 Impact of 2004 Drought on the Educational Access of Children

It is interesting to note that 54% of farmers indicated that the educational access of their children was not affected while 46% indicated that it was affected. The affected group of children form part of the 19% of the Nkonkobe population who do not have formal education. Approximately 3% of Nkonkobe population has matriculated, but does not have a post-matric qualification (NLM IDP 2006/2007).

Table 3.20 Illustration of How the Education of Children Was Affected

What Was The Effect On The Education Of Children?	**Frequency**	**Percentage**
Could not afford tuition fees	54	60.7%
Had to take my children out of school	7	7.9%
Had to take my children out of tertiary institutions.	6	6.7%
Children were not doing well due to starvation.	11	12.4%
Had to leave school and look for employment.	10	11.2%
Other	1	1.1

The highest percentage of farmers (60.7%) could not afford to pay tuition fees for their children whilst others were taken out of schools and tertiary institutions. The 71% rate of people living in poverty in Nkonkobe area after the 2004 drought also explains why the majority of the farmers could not afford to pay fees for their children.

Another possible reason is that the Eastern Cape farmers rely largely on livestock as their primary activity and large numbers of their livestock were lost during the drought which meant that their livelihood suffered severely hence the negative effect on the education of children **(**Nowers 2008).

Impact of Drought on Health Status of Family Members

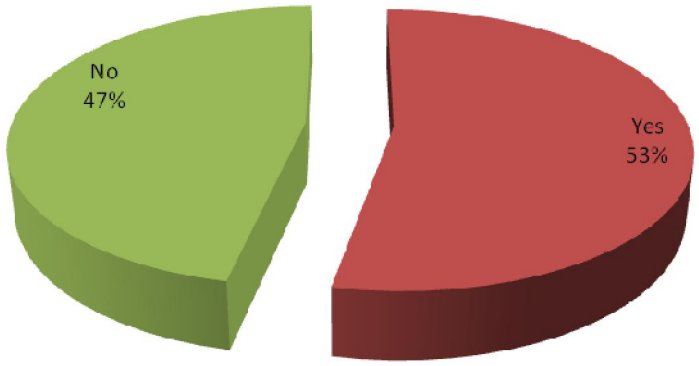

Figure 17 The Impact of Drought on the Health Status of Farm Family Members

The highest percentage of farmers (53%) in Nkonkobe indicated that the heath status of their family members was affected by the 2004 drought. Nationwide surveys conducted by the Ministry of Health and Social Services recorded a total of 75 deaths of children at Namibian hospitals and clinics from January to April 1993 and the loss of those children was a attributed to severe malnutrition during the 1993 drought period (Devereux and Neraa 1996).

During the 1991-92 droughts in Southern Africa, it was estimated that half of the population in the affected areas was at risk of malnutrition and other related health problems (Buckland 1994).

Table 3.21 Shows Number of People in Debts as a Result of Drought

Did Your Debt Levels Increase As A Result Of 2004 Drought?	**Frequency**	**Percentage**
Yes	113	60.4%
No	74	39.6%

One of the reasons for the increase in debt levels is the fact that the farmers do not get enough support from the government during the drought periods as a result of a limited budget. For example in February 2004, it was reported that an amount of R12.7 million would be allocated for drought relief in the Eastern Cape Province (ECP) during the 2004/2005

financial year. Following that announcement, by 4 March 2004, the PDOA had already received applications for 51 138 Livestock Units (LSU) and it became clear that the amount of R12.7 million would not be enough to service all the farmers (PDDMC 2004).

To support the above-mentioned reason, Thando Lolwane in Harman (2008) argues that many farmers in the North West Province were brought down to their knees when the government failed to support them during a drought period and they resorted to the banks to make loans.

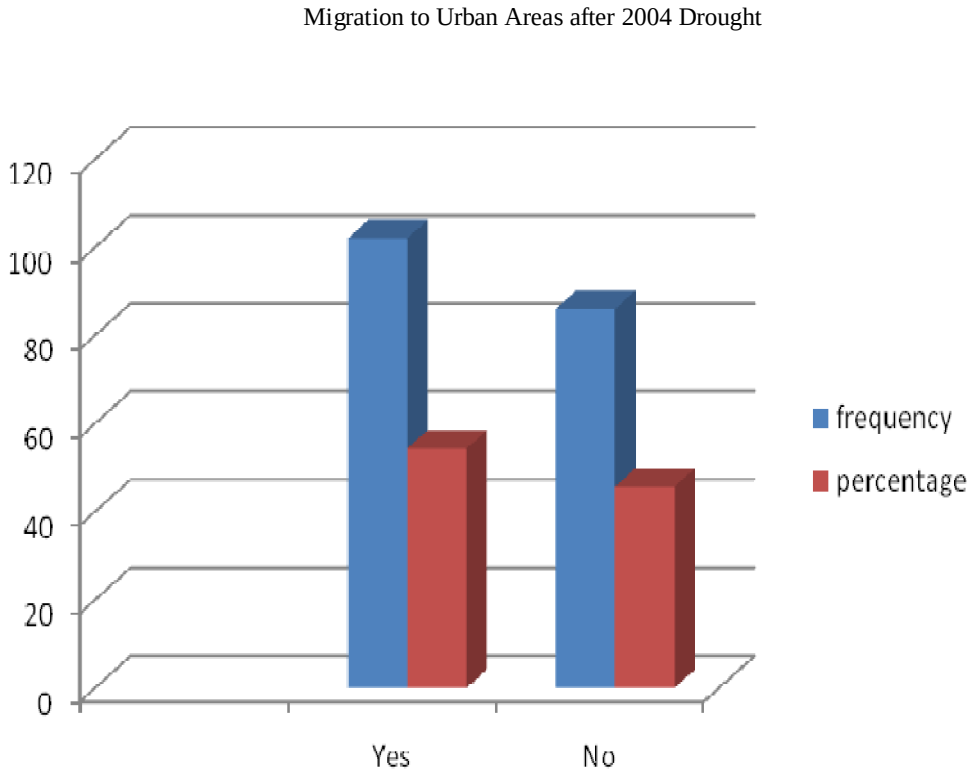

Figure 18 Shows Migration by Family Members as a Result of 2004 Drought

The 2004 drought had tremendous societal implications when it caused family members of 102 farm owners (54.3%) to migrate to urban areas and only 86 farm owners (45.7%) reported that their family members did not migrate.

The same situation occurred in US Great Plains when the droughts of the 1930s caused millions of people to migrate from the southern Great Plains to Califonia (Hensen *et al.* 1999).

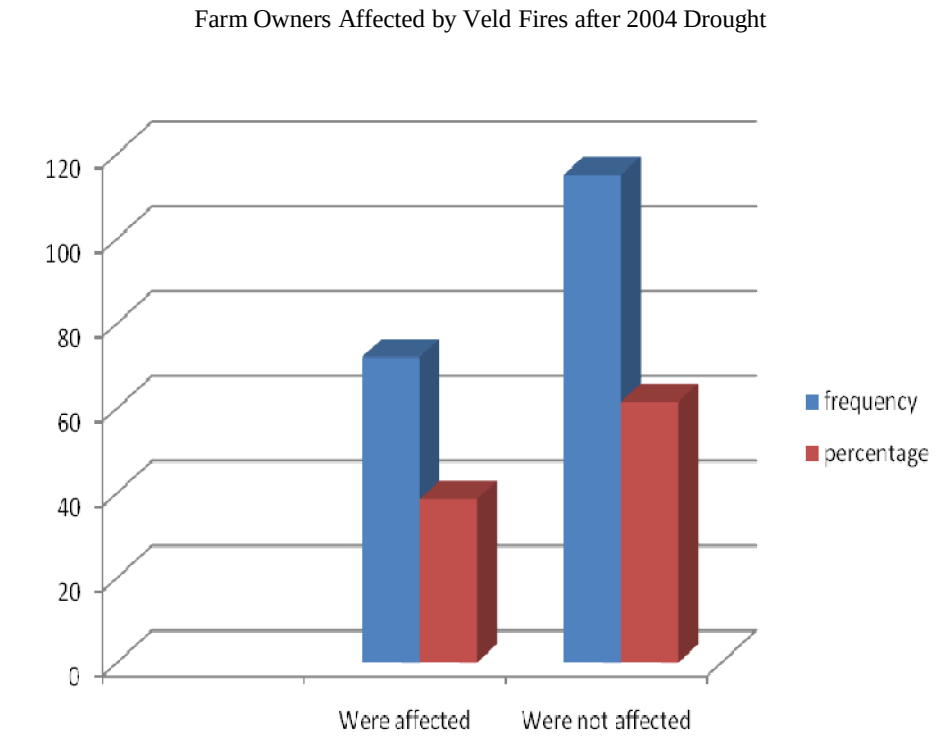

Figure 19 Number of Farm Owners Affected by Veld Fires

The fact that 61.5% of farm owners were not affected by veld fires could suggest that the necessary precautions had been taken by the majority of farmers in Nkonkobe area to prevent the spreading of veld fires during the dry periods. In support of the above statement Kriek (2008) argues that farmers are the only ones taking responsibility for managing and implementing veld fire strategies as required by the National Veld and Forest Fire Act (RSA 101 1998).

In terms of Section 12 of the same legislation, every owner on whose land the fire may start or burn, or from whose land it may spread, must prepare and maintain a fire break between his or her land and any adjoining l

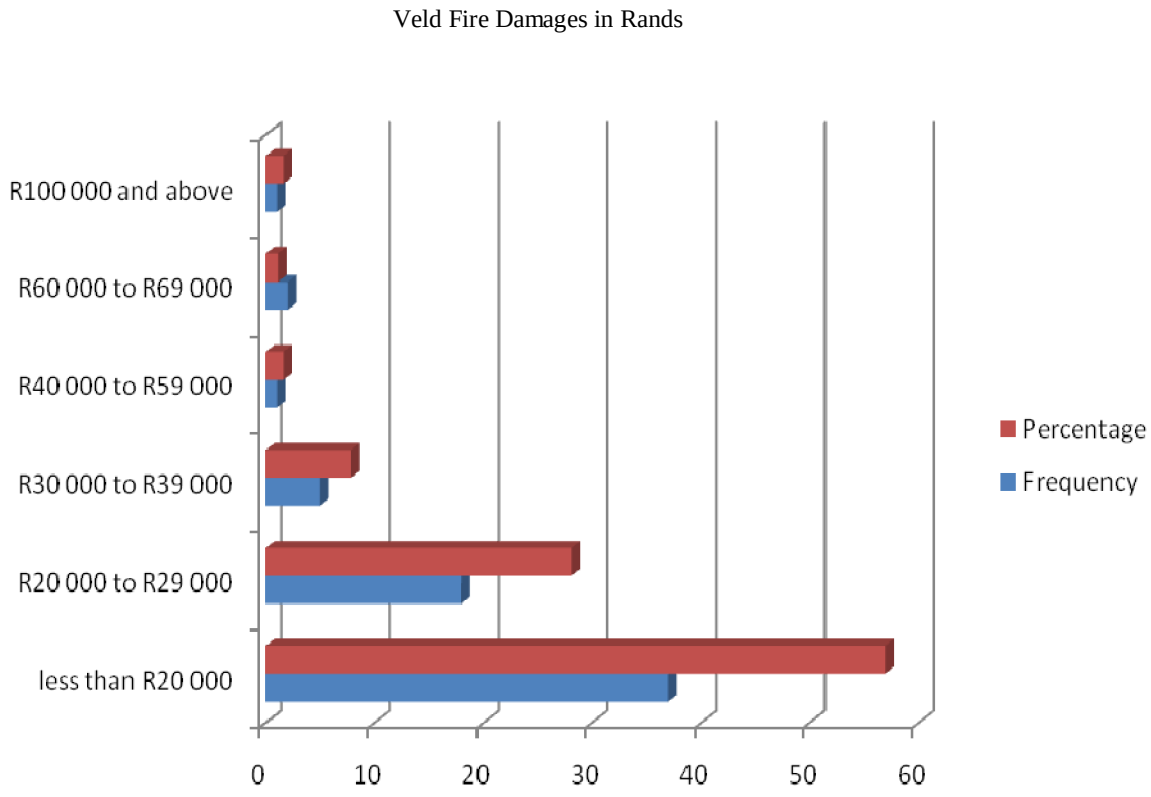

Figure 20 Veld Fire Damages in Rands

Only 64 farm owners out of 189 reported that they lost money due to veld fires and 57% of them lost less than R20 000 whilst 28% lost between R20 000 and R29 000. Another noticeable percentage is 8% of farmers who lost between R30 000 and R39 000 from veld fires.

The above-mentioned damages are an indication that veld fires have a great potential to destroy hectares of grazing land and kill thousands of livestock including people. For example, veld fire induced disasters of 2007 destroyed 368 944 hectares of grazing land and killed five people in the Free State Province (Kriek 2008). During the 2008 fire season, veld fires caused major damages in the Free State Province, again destroying 7 000 hectares of grazing land and 60 sheep were also killed in the process (Coleman 2008).

3.1 Summary of Emotional Impacts and Feelings about 2004 Drought

The aim of this paragraph is to give the readers an opportunity to make their own assessment of how the emotions of the people were affected by the impact of drought. For that reason these responses will not be discussed so that the readers can draw their own conclusions. It must be noted that the aim of this paragraph is not to make comparisons between men and women. All the farmers were asked to express their feelings about the socio economic impact of 2004 drought and this is what they had to say;

- ***Some Comments by Farmers (Male):***

  - Ø *"I lost my mother in that year and I had nothing to bury her with."*
  - Ø "*I got nothing from the government, my name did not appear on the drought relief list and I lost my health until today."*
  - Ø "My thoughts fell down and my life became worse."
  - Ø *"We lost everything. My child gave birth to a mentally retarded baby due to the drought conditions."*
  - Ø *"My life was never the same after losing my livestock. I could not even afford to pay my accounts."*
  - Ø *"My life never changed)."*
  - Ø *"Drought is natural, what can we do?"*
  - Ø *"I have lost hope in this government; it looks like only certain individuals get assistance."*
  - Ø *"My wife was getting sick every time we have to sell some of our livestock for survival. Our livestock travel long distances looking for water and sometimes get lost, this is disturbing us."*
  - Ø *"I had to sell some of possessions to survive, I was affected badly. I am still heartbroken, losing your livestock is never easy."*
  - Ø *"Our health was never the same."*
  - Ø *"I even lost weight from depression, it was tough and I'm still struggling."*

- Ø *"I will never recover from such a loss."*
- Ø *"Life goes on, no drought will destroy me."*

- *Comments by Farmers (Female):*
  - Ø *"It was so painful; I don't want to experience such hardship ever again."*
  - Ø *"We were left with nothing, nothing, nothing."*
  - Ø *"We had to start from scratch, yhoo; I don't even want to talk about it."*
  - Ø *"It is so unfair to see the government helping others and ignoring others. How would you feel about it? It no use paying tax in this country."*
  - Ø *"I was so heart-broken, the grass was so dry, veld fires destroyed our grave yard."*

3.2 Comparison of Responses from Individual Areas

After careful consideration the researcher decided to do comparisons of the three areas of Nkonkobe. Only the questions where major differences between the areas were identified will be compared against one another. The areas of difference that will be discussed have been identified as follows: types of farms, levels of agricultural training, alternative source of income during 2004 drought and service delivery expectations of different areas during 2004 drought

Table 3.22 Shows Types of Farms in Fort Beaufort, Seymour and Balfour

Type Of Farm	**Frequency**	**Percentage**
commercial	1	6.7%
Emerging	8	53.3%
Subsistence	0	0%
Communal	6	40%

(It must be noted that communal in this particular table means a group of community members sharing the farm).

Table 3.23 Types of Farms in Alice

Type Of Farm	Frequency	Percentage
Commercial	4	4.2%
Emerging	5	5.2%
Subsistence	2	2.1%
Communal	85	88.5%

Table 3.24 Types of Farms in Middle-Drift

Type Of Farm	Frequency	Percentage
Commercial	0	0%
Emerging	0	0%
Subsistence	0	0%
Communal	77	100%

The above tables indicate that there are more emerging farmers in Fort Beaufort area (53.3), more communal farmers in Alice (88.5) and only communal farmers in Middledrift area (100%).

Table 3.25 Level of Agricultural Training in Fort Beaufort, Seymour and Balfour

Agricultural Training	Frequency	Percentage
Have agricultural training	10	62.5%
Do not have agricultural training	6	37.5%

Table 3.26 Shows Level of Agricultural Training in Alice

Agricultural training	Frequency	Percentage
Have agricultural training	7	7.4%
Do not have agricultural training	88	92.6%

Table 3.27 Level of Agricultural Training in Middle-Drift

Agricultural Training	Frequency	Percentage
Have agricultural training	11	14.3%
Do not have agricultural training	66	85.7%

The above tables indicate that more farmers of Fort Beaufort area have undergone agricultural training (62.5%) while Alice and Middledrift areas are dominated by farmers who have not undergone agricultural training 92.6% and 85.7% respectively. Therefore emerging farmers are more qualified than communal farmers because Fort Beaufort is dominated by emerging farmers and whilst the farmers of other two areas are predominantly communal.

Table 3.28 Alternative Source of Income in Fort Beaufort, Seymour and Balfour

Alternative Source Of Income	Frequency	Percentage
No Alternative source of income.	4	30.8%
Received salary from other employment.	2	15.4%
Received support from family	4	30.8%
Received old age pension	3	23.1%

Table 3.29 Alternative Source Of Income In Alice

Alternative Source Of Income	Frequency	Percentage
No Alternative source of income.	11	11.8%
Received salary from other employment.	28	30.1%
Received support from family.	27	29%
Received support from friends	1	1.1%
Received support from neighbours.	1	1.1%
Received old age pension.	18	19.4%

Table 3.30 Alternative Source of Income in Middle-Drift

Alternative Source Of Income	Frequency	Percentage
No alternative source of income	14	18.2%
Received salary from other employment.	37	48.1%
Received support from family	14	18.2%
Received support from friends	0	0%
Received support from neighbours.	1	1.3%
Received old age pension	10	13%
Other	1	1.3%

According to the above tables, 30.8% of Fort Beaufort farmers had no alternative source of income whilst another 30.8% received support from family members and only 15.4% received salaries from other employment. These results show that most of the emerging farmers from the Fort Beaufort are depending mainly on farming for survival whilst most of the communal farmers depend on alternative employment during drought periods.

Table 3.31 Service Delivery Expectations of Nkonkobe Farmers in Priority Order

Fort Beaufort,	Alice	Middle-drift
1. Provide more feed and funding	1. Provide more feed for livestock	1. Provide more feed for livestock
2. Provide more water supplies	2. Provide more funding	2. Provide more funding
	3. Provide more water supplies	3. Provide more water supplies
	4. Provide more training	4. Provide all the services listed (not certain about priorities)

The first priority in Fort Beaufort area is the provision of feed and funding during drought periods whilst Alice and Middle Drift farmers want feed for their livestock. The second highest priority for Alice and Middle Drift is the provision of more funding, the reason being that these areas are dominated by poverty-stricken communal farmers as was indicated under

the background. The second highest priority for the Fort Beaufort area dominated by emerging farmers is the provision of more water supplies.

3.3 Conclusion

The overall analysis of the research results for the Nkonkobe area as a whole was done. Comparison between the socio economic environment of the Nkonkobe area and the socio-economic status of farmers was done in order to determine the extent of contribution made by the farmers in terms of local economic growth.

The level of agricultural training for farmers of Nkonkobe is a cause for concern. In addition to that, it became clear that women and young people dominate the population, but their participation in farming is lacking. The expectations of different areas in terms of service delivery were discussed so that their priorities can be considered when planning is done.

CHAPTER 4: CONCLUSION AND RECOMMENDATIONS

4. Conclusion

The results of this study have pointed out that Eastern Cape Province has the largest number of livestock in South Africa and it is where communal farming is practised on the largest scale. During the various meetings that were held with the farmers, it became clear that although the government intervened during 2004 drought period, the intervention was not enough to meet all the needs of the affected farmers. Farmers, particularly the communal ones have become so dependent on the relief provided by government to such an extent that planning for drought is not given the attention it deserves. It seems that the low level of agricultural training has worsened the impact of drought in Nkonkobe because the majority of farmers do not know how to develop drought plans.

However, the government cannot be blamed entirely because farmers also failed to implement the indigenous planning methods of drought. This argument gives rise to another question, "what role does the indigenous knowledge play in reducing the socio economic impact of drought?" this study does not answer that question and therefore other researchers are encouraged to conduct a study that will answer that question, in future. Participation of women and the youth on farming is lacking although they are dominating the population of Nkonkobe. It also became evident that people's lives are put at stake as a result of malnutrition when drought occurs.

Farmers of Fort Beaufort expressed dissatisfaction about lack of coordination between the department of agriculture in Nkonkobe, Nkonkobe satellite disaster centre and the farmers association. The lesson that can be learnt from the socio economic impact of 2004 drought is that, no amount of drought relief will reduce the drought impact as long as the level of drought preparedness for farmers is not improved. Therefore, the government should move away from being reactive towards a more proactive planning approach.

4. 1 Recommendations Arising from the Study

The results of this study have pointed out that the Eastern Cape is where communal farming is practised on the largest scale and therefore the following aspects need to be addressed:

- The Provincial department of agriculture in collaboration with Amathole District and Nkonkobe municipalities should put programmes in place aimed at capacitating the communal and emerging farmers so that they can also mature and become commercial farmers in future. There will be an increase in economic growth and the unemployment rate will be reduced.
- The young people should be encouraged to pursue farming as a career because apart from forming the largest part of the population in Nkonkobe, their participation in farming is lacking. To achieve this, more bursaries on farming-related studies should be offered by the government. This would also assist in improving the level of agricultural training which is lacking in Nkonkobe. Poor families can also benefit as they cannot afford to send their children to the tertiary institutions, particularly during the drought periods.
- The majority of farmers do not have drought insurance because they cannot afford it. It is therefore recommended that farmers should be subsidized towards paying insurance for their farms.
- The Department of Agriculture should also conduct workshops to educate the farmers on how they should develop drought plans and also to educate them about the drought mitigation and coping strategies. If they have those in place the insurance premiums will become affordable. It is common knowledge that the higher the risk, the higher the insurance premium.
- The Department of Social Development should consider providing appropriate support for farmers during drought periods. The expected support should be in the form of a monthly supply of groceries and money if possible. This would assist in ensuring that the debt levels of farmers remain low during the periods of droughts.
- Fire Protection Associations should be established in all areas of Nkonkobe in order to minimise losses incurred by farmers as a result of veld fires.
- Psychological counselling should be provided to the victims of natural disasters to assist them in coping with the effects, particularly the effects of droughts.

- An Early Warning System should be put in place for the effective management of drought in Nkonkobe area and if possible for the Eastern Cape Province as a whole. To be effective, a drought early warning systems should be able to provide the following information:
    - ü Spatial extent of drought
    - ü Duration of drought
    - ü Time of occurrence of drought in relation to the crop calendar

- Early warning can be improved through the establishment of the Disaster Risk Management Committees (DRMC) at ward level as stipulated in the National Disaster Management Framework of 2005. The composition of DRMC is proposed as follows:

    - ü Community leaders
    - ü Representatives of farmers associations
    - ü Representatives of fire protection associations
    - ü Agricultural officials/experts/extension officers
    - ü Ward committee members
    - ü Disaster Management officials
    - ü Disaster management volunteers
    - ü Community members (Indigenous knowledge, Technical expertise)
    - ü Representatives from the local schools.
    - ü Community liaison officers who would be able to disseminate warnings more effectively to local communities.
    - ü Any other members as may be deemed necessary

- Responsibilities of the DRMC should include ensuring that early warning information is effectively communicated to the communities to make arrangements for emergency action when disaster strikes.
- All the committee members should be linked to the office of the South African Weather Services to ensure that they receive first hand early warning information.
- Distributing information brochures at clinics, community centres, shops and educational institutions.

- The general level of education of rural communities should be improved through programmes such as adult basic training.
- Special attention needs to be given to capacity building in the rural community organisations responsible for the management and control of water supplies at local level.
- Development should be geared towards providing sustainable basic water infrastructure and that should form part of proactive drought mitigation strategies.
- The pre-drought strategies of Nkonkobe municipality should include development of ground water supplies which should be carefully managed so as to provide a back up during the times of drought.
- Creation of sustainable work opportunities to raise the income level of rural farmers of Seymour, Balfour and Ford Beaufort areas of Nkonkobe. They were concerned about the lack of coordination and non-visibility of agricultural officers among farmers. To address this challenge, it is recommended that a committee be established between Farmers, Agricultural Officers and Nkonkobe Disaster satellite Centre. Farmers should also be invited to attend Nkonkobe Disaster Management Forum meetings at Nkonkobe.
- Veld fires have destroyed fencing around the grazing lands of Nkonkobe; it is therefore recommended that DOA should provide fencing to reduce road accidents as a result of stray animals. ADM fire dept, DWAF and the Provincial Department of agriculture should provide fire equipment for the existing FPA and land owners should be encouraged to form more FPAs in Nkonkobe area because one FPA is not enough.
- Service delivery expectations of Nkonkobe farmers should be addressed according to the findings as indicated in Table 33.

In addition to the above, the researcher has also noted that the majority of farmers in Nkonkobe do not know how to develop drought plans. The following guidelines on developing a drought plan are thus recommended:

4.2 Developing a Drought Plan

Ÿ Under this section the person who is leading the process of developing the plan should be introduced. In Nkonkobe Municipality it is recommended that one disaster officer

and one agricultural officer should lead the process. The leadership should establish a task team and the duties of the task team should include the following:

- ü Supervision and co-coordinating the development of the drought plan.
- ü Secondly, during the times of drought, the task team will be responsible for the co-ordination of actions and for the implementation of the mitigation and the response programmes.
- ü Identifying groups at risk and compiling resource inventory.

- Vision and strategic objectives of the Drought Management Plan (DMP). The vision of the Nkonkobe department of Agriculture should be stated here, briefly and should be followed by the development of the strategic objectives.

- Preparing/ writing the drought plan. The plan should have the following three primary components:

  - ü Monitoring and early warning
  - ü Vulnerability and impact assessment
  - ü Mitigation and response

  It is recommended that a committee be established to focus on the first two components. The task force will carry out the mitigation and response function.

- **Vulnerability and Impact Assessing Committee**

  Vulnerability and Impact Assessing Committee must be established and its main function should be to communicate a criterion that will be used to assess the impact of drought when it occurs. From the proactive perspective, the criteria to be used in conducting vulnerability assessment should also be communicated to all the relevant stakeholders.

Ÿ The most effective approach in drought assessment is to create a series of working groups. The committee and the working groups should have the following responsibilities: to assess sectors, population groups and to identify the most reasonable mitigation measures to address drought disasters (DIM 608).

- Role of the Provincial Department of Agriculture should be:

    - ü Lead education and awareness campaigns
    - ü Ensure that farming communities implement risk reduction measures
    - ü Determine and establish the severity and magnitude of drought in the province
    - ü Prepare and review drought disaster management operational plans
    - ü Compile drought indicator maps to review the drought situation in the province
    - ü Prepare a Provincial Disaster Management Plan.

- Role of Local Government.

  The role that should be played by Nkonkobe has already been explained above.

- Farming communities

  Farmers should apply prevention and mitigation strategies for example the planting of drought-tolerant crops, de-stocking and consider taking insurance against drought.

- Additional information

  It is important to note that these drought guidelines were first developed by Wihite, (1999). The researcher has only adjusted them to suit the challenges faced by the farmers of Nkonkobe Municipality. All the recommendation that are contained in this document should be considered when the drought plan for Nkonkobe is developed.

- Publication of the plan

The disaster management officials and the officials from the Department Of Agriculture should conduct workshops to educate the public about the contents of the draft plan and ask for the inputs from other role players. The final plan should be published in the Government Gazette once it has been approved and signed by the relevant authorities (Wilhite 1999).

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APPENDIX: A

QUESTIONNAIRE USED FOR COLLECTING QUANTITATIVE AND QUALITATIVE DATA ON FARM OWNERS OF NKONKOBE MUNICIPALITY

(A). BACKGROUND INFORMATION

Question 1

WHAT IS THE TYPE OF FARM YOU ARE OCCUPYING?

1.	Commercial	
2.	Emerging	
3.	Subsistence	
4.	Communal	
5.	Other (specify)	

Question 2

WHO IS THE OWNER OF THE FARM?

1.	My own farm	
2.	lease	
3.	Communal(sharing)	
4.	Other (specify)	

Question 3

WHAT IS YOUR MARITAL STATUS?

1.	Single	
2.	Married	
3.	Widowed	
4.	Divorced	
5.	Separated	

Question 4

WHAT IS YOUR POSITION IN THE FARM?

1.	Husband	
2.	Wife	
3.	mother	
4.	Grandparent	
5.	Relative	
6.	Other (specify)	

Question 5

AGE IN YEARS

1.	61 and above	
2.	41 - 60	
3.	31 - 40	
4.	21 - 30	
5.	20 and below	

QUESTION 6

HOW MANY DEPENDENTS DO YOU HAVE?

1.	10 and above	
2.	7 - 9	
3.	4 - 6	
4.	3 - 5	
5.	2 and less	

Question 7

ETHNIC GROUP

1.	Xhosa	
2.	Afrikaans	
3.	English	
4.	Other (Specify)	

(B) INFORMATION

Question 8

HIGHEST STD OF EDUCATION

1.	Never been to school	
2.	Primary (std 1 – std 5)	
3.	Junior secondary (std 6 – std 7	
4.	Secondary ((std 8 – std 10)	

Question 9

HAVE YOU UNDERGONE AGRICULTURAL TRAINING?

1.	Yes	
2.	No	

Question 10

IF YOU ANSWERED YES, WHAT LEVEL OF AGRICULTURAL TRAINING DID YOU UNDERGO?

1.	Short course(Less than 1 year)	
2.	Certificate (1 year)	
3.	Diploma	
4.	Technikon	
5.	University degree	
6.	Other (Specify	

Question 11

IF YOU ANSWERED NO, WHY DID YOU NOT UNDERGO TRAINING

1.	Could not afford it	
2.	Did not think about it	
3.	Was not willing to do it	
4.	Other (Specify)	

Question 12

WHAT IS YOUR PRIMARY FARMING ACTIVITY?

1.	Cattle	
2.	Maize	
3.	Sheep and/goats	
4.	Poultry	
5.	Pigs	
6.	Fruit(citrus)	
7.	Fruit (Different types)	
8.	Dairy	
9.	Other (Specify	

Question 13

TO WHOM DO YOU SELL THE PRIMARY PRODUCT MENTIONED ABOVE?

1.	Direct to the public	
2.	Local fresh produce market	
3.	Direct to supermarket/retail stores/hawkers	
4.	Hospitals/schools/hostels/hotels	
5.	Other(Specify)	

Question 14

WHAT WAS THE ANNUAL PROFIT FROM YOUR PRIMARY FARMING ACTIVITY

BEFORE 2004 DROUGHT?

1.	less than R20 000	
2.	R20 000 – R29 000	
3.	R30 000 – R39 000	
4.	R40 000 – R59 000	
5.	R60 000 – R69 000	
6.	R70 000 – R79 000	
7.	R80 000 – R89 000	
8.	R90 000 – R99 000	
9.	R100 000 and above	

Question 15

WHAT IS YOUR SECONDARY FARMING ACTIVITY? CHOOSE ONLY ONE FROM THE LIST PROVIDED.

1.	Cattle	
2.	Maize	
3.	Sheep and/goats	
4.	Poultry	
5.	Pigs	
6.	Fruit (Citrus)	
7.	Fruit (different types)	
8.	Dairy	

9.	Mixed	
10.	Other (Specify	

Question 16

WHAT WAS THE ANNUAL RPOFIT FROM THE SECONDARY ACTIVITY (PRODUCT) CHOSEN ABOVE BEFORE 2004 DROUGHT?

1.	less than R20 000	
2.	R20 000 – R29 000	
3.	R30 000 – R39 000	
4.	R40 000 – R59 000	
5.	R60 000 – R69 000	
6.	R70 000 – R79 000	
7.	R80 000 – R89 000	
8.	R90 000 – R99 000	
9.	R100 000 and above	

Question 17

WHAT WAS YOUR ANNUAL LOSS IN RANDS AS A RESULT OF 2004 DROUGHT?

1.	less than R20 000	
2.	R20 000 – R29 000	
3.	R30 000 – R39 000	
4.	R40 000 – R59 000	

5.	R60 000 – R69 000	
6.	R70 000 – R79 000	
7.	R80 000 – R89 000	
8.	R90 000 – R99 000	
9.	R100 000 and above	

Question 18

WHAT WAS YOUR ALTERNATIVE SOURCE OF INCOME DURING 2004 DROUGHT?

1.	No alternative source of income	
2.	Received salary from other employment	
3.	Received support from family	
4.	Received support from friends	
5.	Received support from neighbors	
6.	Received subsidy from government	
7.	Other(Specify	

Question 19

DID YOU HAVE INSURANCE AGAINST DROUGHT IN 2004?

1.	Yes	
2.	No	

Question 20

IF YOU ANSWERED NO ABOVE, WHY DID YOU NOT HAVE INSURANCE?

1.	Could not afford it	
2.	Did not think about it	
3.	Was not willing to take it	
4.	Other (Specify)	

Question 21

HOW MANY PEOPLE WERE EMPLOYED IN YOUR FARM IN 2004?

1.	20 and above	
2.	10 - 19	
3.	5 - 9	
4.	3 - 5	
5.	2 and less	

Question 22

DID YOU RETRENCH ANY EMPLOYEES AS A RESULT OF 2004 DROUHT?

1.	Yes	
2.	No	

Question 23

IF YOU ANSWERED YES, HOW MANY EMPLOYEES DID YOU RETRENCH?

1.	20 and above	
2.	10 - 19	
3.	5 - 9	
4.	3 - 5	
5.	2 and less	

Question 24

DID YOU HAVE DROUGHT PLANS/DROUGHT MITIGATION STRATEGIES IN PLACE DURING 2004 DROUGHT?

1.	Yes	
2.	No	

Question 25

IF YOU ANSWERED NO IN QUESTION 21, WHY DID YOU NOT HAVE DROUGHT PLAN?

1.	Did not know how to develop the plan.	
2.	Did not think about it at all	
3.	Did not think it was necessary to have one	
4.	Other (specify)	

Question 26

DID THE GOVERNMENT DO ENOUGH TO ASSIST THE FARMERS IN 2004?

1.	Yes	
2.	No	

Question 27

IF YOU ANSWERED NO, WHAT DO YOU SUGGEST THE GOVERNMENT SHOULD HAVE DONE TO ASSIST FARMERS?

1.	Give them more training about drought coping strategies.	
2.	Provide more water supplies for farmers.	
3.	Provide more funding for farmers	
4.	Provide more feed for livestock	
5.	Other (Specify)	

Question 28

WHAT WAS YOUR MAIN SOURCE OF WATER IN 2004?

1.	Dams	
2.	River	
3.	Running water in the house	
4.	Communal tap	
5.	Boreholes/wind-mills	
6.	Other (Specify)	

Question 29

HOW MANY CATTLE DID YOU HAVE BEFORE 2004 DROUGHT?

1.	100 and above	
2.	80 -99	
3.	60 - 79	
4.	40 - 59	
5.	20 – 39	
6.	19 and less	

Question 30

HOW MANY CATTLE DID YOU LOSE DURING 2004 DROUGHT?

1.	100 and above	
2.	80 -99	
3.	60 - 79	
4.	40 - 59	
5.	20 – 39	
6.	19 and less	

Question 31

HOW MANY SHEEP AND/ GOATS DID YOU HAVE BEFORE 2004?

1.	100 and above	
2.	80 -99	
3.	60 - 79	
4.	40 - 59	
5.	20 – 39	
6.	19 and less	

Question 32

HOW MANY SHEEP AND/ GOATS DID YOU LOSE AS A RESULT OF 2004 DROUGHT?

1.	100 and above	
2.	80 -99	
3.	60 - 79	
4.	40 - 59	
5.	20 – 39	
6.	19 and less	

Question 33

WAS THE EDUCATIONAL ACCESS OF YOUR CHILDREN AFFECTED?

1.	Yes	
2.	No	

Question 34

IF YOU ANSWERED YES ABOVE, EXPLAIN HOW?

1.	Could not afford tuition fees	
2.	Had to take my children out of school	
3.	Had to take my children out of tertiary institutions	
4.	My children were not doing well in school due to starvation	
5.	They had to go and look for employment	
6.	Other (Specify)	

Question 35

WAS THE HEALTH STATUS OF YOUR FAMILY MEMBERS AFFECTED BY DROUGHT?

1.	Yes	
2.	No	

Question 36

DID YOUR DEBT LEVELS INCREASE AS A RESULT OF 2004 DROUGHT?

1.	Yes	
2.	No	

Question 37

DID YOUR FAMILY OR SOME MEBERS OF THE FAMILY MIGRATE TO THE URBAN AREAS/CITIES AS A RESULT OF 2004 DROUGHT?

1.	Yes	
2.	No	

Question 38

WAS YOUR FARM AFFECTED BY VELD-FIRES AS A RESULT OF 2004 DROUGHT?

1.	Yes	
2.	No	

Question 39

IF YOU ANSWERED YES, WHAT WAS THE VELD FIRE DAMAGE IN RANDS IN YOUR FARM?

1.	less than R20 000	
2.	R20 000 – R29 000	
3.	R30 000 – R39 000	
4.	R40 000 – R59 000	
5.	R60 000 – R69 000	
6.	R70 000 – R79 000	
7.	R80 000 – R89 000	
8.	R90 000 – R99 000	
9.	R100 000 and above	

Question 40

WHAT ARE YOUR FEELINGS ABOUT 2004 DROUGHT AND HOW DID IT AFFECT/CHANGE YOUR LIFE?

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