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DROUGHT IN SOUTH AFRICA: LESSONS LOST AND/OR LEARNT FROM 1990 TO 2005

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A dissertation submitted to the Faculty of Science, University of the Witwatersrand, Johannesburg, in fulfillment of the requirements for the degree of Master of Science.

May 2008

DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted for the Degree of Master of Science in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

_____

Wayne Devlin Austin

_____ day of _____ 2008

ABSTRACT

Drought and its associated impacts have been causing critical problems for agriculture, vulnerable communities and overall development for many years in South Africa. Impacts of drought such as the effects on a regions' climatology, increases in food insecurity and food prices and the integration of drought with factors such as the HIV/AIDS epidemic have led government to introduce various policies dealing, in particular, with drought risk. By means of examining government documents, journal articles and media publications the methods government has employed to reduce the impacts of drought are traced. The way government has handled drought in the recent past, such as during 1991/92 and 2003/04, with regard to maize farming and vulnerable populations, is of great importance for learning lessons in drought-risk reduction for the future. Lessons Government has learnt include shifting drought management policy and those lost from recent drought episodes include improving early warning systems and incorporating HIV/AIDS in drought strategies. The research also presents suggestions for alleviating the impacts of drought and for better managing the events. The Government, with at least a twenty year history of drought situations and drought governance, provides an interesting range of experience that can present a useful set of cases that may yield valuable insights into the future.

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PREFACE

Drought is one of the most frequent and devastating phenomena that occur in South Africa. The impacts of drought (first order impacts such as food security concerns and second order impacts such as increasing food imports from abroad) produce a range of effects for many in society (Benson and Clay, 1998). The impacts of drought are varying in degree. Most of them are particularly evident in the agricultural sector and for vulnerable communities in the country (Wilhite and Vanyarkho, 2000). Food insecurity, for example, is one of the biggest associated impacts of drought as the level of food is usually reduced during a drought thereby increasing the vulnerability of people (UNDP-BCPR, 2005).

The Government of South Africa has made several attempts to reduce the impacts of drought in recent years (Vogel, 1998). Policies to reduce the impacts of drought have also shifted over time, moving from an impacts-and relief-approach to a greater risk-reduction approach. The impacts of the 1991/92 drought, for example, were largely addressed by relief responses (Vogel, 1998). Following this period and also spurred on by changes in government, a shift in the national drought risk strategy to a more proactive approach emerged. Effective drought management strategies, however, have been impeded by coordination problems and a lack of ability of government (Vogel *et al*., 2000).

Several changes in other policy arenas can either enhance or reduce drought impacts. The agricultural sector, for example, has been the subject of several policy changes since 1991. The introduction of new policies also occurred with one of the most important being the deregulation of agricultural markets. The policy attempted to reduce government intervention and regulation and to

improve market efficiency (Groenewald, 1991). There were unintended outcomes from the policy that affected the production of food and development of farmers in South Africa. Other policies of major importance for agriculture and drought risk management, particularly in shifting the focus from a reactive to a proactive response, were the Disaster Management Act of 2002 and the National Disaster Risk Management Framework of 2005 (van Zyl, 2006).

Government policies have far reaching consequences as they have the potential to reduce the harmful effects of drought (Knutson *et al*., 1998). The amount of media coverage of drought in publications such as newspapers, keep the public informed as to the way that the Government is handling the situation. The media therefore has the capability to enlighten the public of existing management strategies as well as of measures available to them to reduce the effects of drought (Wilhite *et al*., 2000). The use of the media to disseminate information can therefore aid the Government in coping with future climate variability.

The aim of this study is to examine the impacts of drought on agriculture and vulnerable populations and to assess the attempts by government to reduce these effects. The lessons government has learnt and/or lost in drought risk reduction and management are extracted and noted for future drought management. The dissertation is divided into seven chapters. Chapter 1 provides the necessary background on drought, the impacts thereof and understanding drought management. Chapter 2 contains a description of data collection and analysis methodologies. In Chapter 3, the impacts of recent droughts are assessed to show why government intervention is required and Chapter 4 examines the policies used by government to reduce the effects of drought. Chapter 5 provides a case study of the impacts and government interventions around the 2003/04 drought in South Africa as well as the opinions of the public and of farmers around drought management and shows how drought information can be distributed. In Chapter 6 the ways to improve on drought management and mitigation are discussed. Important findings and lessons learnt and lost are summarized in Chapter 7.

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CHAPTER 1

GENERAL OVERVIEW

1.1 Introduction

Droughts are common occurrences in southern Africa (Vogel, 1995). They occur regularly, and vary in magnitude and frequency. The recently released fourth assessment report of Working Group 1, IPCC notes that droughts may become even more severe and occur more frequently in the future (IPCC, 2007). If these outlooks are true, then we need to be improving our understanding of drought as a phenomenon and also enhancing our ability to effectively manage drought and reduce risks to drought. In this dissertation, an attempt is made to explore drought risks in South Africa.

One sector, namely agriculture and in particular maize, is selected for detailed investigation. This sector is chosen because maize is the staple food of most of the South African population, particularly the poor (Chabane, 2003). The variability of the southern African climate, especially drought periods, therefore impacts on the ability to access maize in sufficient amounts as maize is extremely dependent on rainfall. Impacts and the response to drought are examined. The dissertation will show the extent to which there has been a shift from a drought management approach that is reactive to one that is more proactive and based on risk reduction.

In this chapter an overview of the research will be discussed followed by a synopsis of drought experience since 1991 in South Africa. Drought definitions, impacts and government interventions will be explored. Associated drivers of change such as macro-drivers from food exports and the liberalization of food prices will also be shown later in this chapter. These drivers of change can exacerbate the impacts of drought and will be discussed in greater detail in chapter 3.

The 1991/92 drought is one of the worst recent droughts on record in the country due to the far reaching impacts felt through all sectors of society (Glantz *et al*., 1997 and Vogel *et al*., 2000). As a result of the devastating drought of 1991/92 there were many, including those actively engaged in the agricultural sector, that felt that the government should be more proactive in managing drought in South Africa (Bruwer, 1989). Since this time, the South African Government has made several attempts to improve drought management as discussed in chapter 4. A drought policy for the region is also currently under development.

Several factors highlight the importance and need for better and improved drought management and drought risk reduction. The El Niño Southern Oscillation (ENSO), for example, was not a key factor used to explain droughts in the early 1990s. By the middle of the 1990s, however, ENSO was completely attributed with the reasons for the occurrence of the renewed droughts (Glantz *et al*., 1997). The extreme changes in drought understanding and especially the variable climate have slowed down effective drought policy as government struggles with these instabilities. Climatic variability is also a significant feature with regard to rainfall in South Africa and as a result the growing concern is for the understanding of within-season rainfall characteristics (Reason *et al*., 2005). The reason for this is that there is a need to improve responses and management of within-season rainfall instead of only the overall seasonal rainfall (Clay *et al*., 2003).

Agriculture is an important sector for the South African economy as it has major implications for job creation, rural development, food security and foreign

exchange (National Treasury, 2003). The agricultural sector includes all activities relating to actual farming, the supply of inputs such as fertiliser and the processing and distribution aspects that add value to farm products (National Treasury, 2003). Commercial farming is the dominant performer in the agricultural sector, but small, subsistence and emergent farming also play a crucial role. These farmers have a strong impact on poverty reduction, job creation and food security in rural areas (National Treasury, 2003).

Droughts have significant and long lasting effects on the agricultural sector of South Africa. Food security is one of the most important concerns resulting from drought as much of the hunger of the world is related to highly variable rainfall, especially in rural areas (UNDP-BCPR, 2005). Maize, for example, is highly sensitive to variations in rainfall as an extended dry period can result in lower grain formation and a decreased maize yield (Clay *et al*., 2003). There are also a range of other outcomes that can be triggered. The price of staple foods such as maize is an example of such an outcome as this is also a major concern during droughts. The price of basic foods tends to increase during droughts as supplies become scarcer. Larger farmers are also able to exacerbate rising prices as they release less stock to drive the price up to increase profits, but at the same time hurting the consumer who has to pay more for their food (Food Pricing Monitoring Committee, 2003).

With the above in mind, it is important to note that there are several conditions which shape the onset of a drought, and which have the ability to enhance the effects of a drought. One of these pre-existing conditions is vulnerability (Devereux, 2006). Drought usually provides the trigger that result in, for example, vulnerable communities requiring some form of intervention (Washington and Downing, 1999). The aim is to enhance the resilience of these peoples so that they are better able to cope with natural hazards (Devereux, 2006). The HIV/AIDS epidemic is another pre-existing condition that enhances the effects of any drought by decreasing affected people's ability to deal with further complications such as increased food prices (Drimie, 2004). The HIV/AIDS epidemic often results in the

removal of the strongest and most experienced members of a family, which exacerbates the food security crisis, because the weaker, less experienced members of the family are left to fend for themselves (Drimie, 2004).

Having briefly discussed the effects of drought on society, attention now turns to address in more detail some of the ways in which government interacts in drought policy. The major role played by the Government is to create an environment that is beneficial to the development and growth of the agricultural sector to improve food security. The way this can be achieved is by implementing policies and institutionalizing food production and farmer support programmes (National Treasury, 2003). In the recent past the Government has attempted to improve the situation by introducing several policies for drought and agriculture (Vogel *et al*., 2000). However, in many cases, these policies did not prove successful mainly because a lack of political commitment to reduce vulnerabilities to various risks compounded the drought situation (Vogel, 2002). The inability to improve factors such as early warning systems and the country's railway infrastructure has also added to the problem as these factors are crucial for sustaining effective drought risk reduction (Food Pricing Monitoring Committee, 2003).

The management and mitigation of droughts in South Africa has become an important concern for the Government since the late 1990s (National Department of Agriculture, 1998). The White Paper on Agriculture began the change to improving the way droughts are managed in the country as the focus shifted from relief to prevention and mitigation (van Zyl, 2006). The Disaster Management Act followed in 2002 and this provided for a disaster management policy focused on risk reduction and emergency preparedness (van Zyl, 2006). The combined impacts of HIV/AIDS, food prices, poor governance and trade policy together with climate variability have threatened to increase risks of communities without adequate food and livelihoods (Vogel, 2002). Drought therefore needs to be seen as both a physical and social occurrence requiring not only technical solutions, but also substantial political determination (Vogel and Smith, 2002).

1.2 Literature Review

1.2.1 Drought

Droughts are multi-faceted and are the product of a complex array of causal mechanisms including biophysical and socio-economic factors (Wilhite, 2000). There are several facets of drought and these include characteristics, causes, vulnerability to drought and consequences or impacts of drought. In the discussion that follows these facets of drought will be examined.

Droughts are endemic features in southern Africa. Throughout the twentieth century droughts have occurred over South Africa with great regularity (Vogel, 1995). According to the South African Weather Service any amount of rain less than seventy-five percent of normal annual rainfall constitutes a meteorological drought. This and other categories of drought will be discussed in the next section. In South Africa, three important drought periods, in which the major part of the country has experienced below-normal rainfall, have been observed over the last fifteen years (Mason and Tyson, 2000). The major drought years have been 1991/92, 1997/98 and 2001/02 (Mason and Tyson, 2000). The drought of the early 1990s was by far one of the most severe droughts on record in South Africa due to the effects on food production and vulnerable communities (Vogel, 1995).

There is a lack of a precise definition of drought, and this has been an obstacle in understanding the concept, often contributing to indecision or inaction by policy makers (Wilhite, 2000). Definitions should be region and impact specific in order to be used in a useful manner by decision makers. Operational definitions attempt to identify precise characteristics and thresholds that define the onset, continuation and termination of drought episodes as well as their severity (Wilhite, 2000). The most crucial lesson though, is realizing that drought is not only a lack of rain, but can also be defined by its impacts, both direct such as crop shortages, and indirect such as price increases (Glantz *et al.*, 1997).

Drought is an unavoidable natural hazard and the adverse effects penetrate many areas of society such as land quality, area planted both for local consumption and for export purposes, food imports, labour supply and rural poverty (Glantz *et al.*, 1997). Interdependent socio-economic conditions such as price increases are then revealed as the drought gradually worsens. Drought can thus be defined as an exogenous supply-side shock that generally causes sharp declines in agricultural output, export earnings, employment and income levels (Glantz *et al.*, 1997). Figure 1.1 shows how these impacts spread throughout the economy by means of sectoral linkages and multiplier effects. Having introduced the concept of drought, attention now turns to the characteristics of drought.

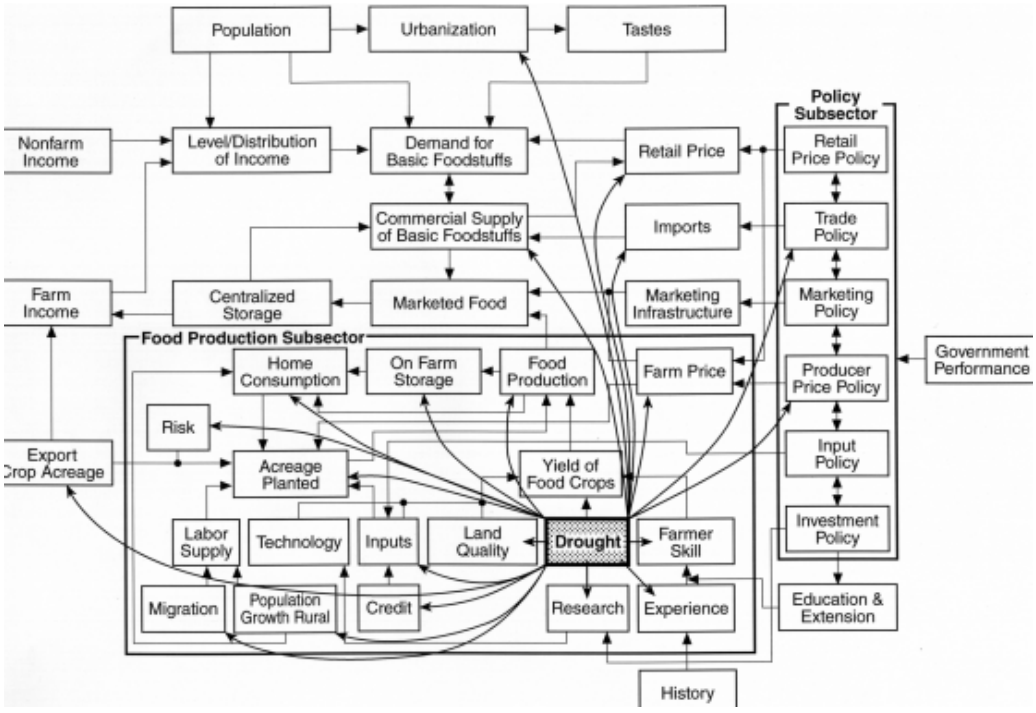


Figure 1.1 The impacts of drought spread through all facets of the economy due to the close sectoral linkages (Glantz *et al.*, 1997, chapter 2).

1.2.2 Characteristics of Drought

The characteristics of drought along with far reaching impacts make its effects on society, economy and environment difficult, though not impossible to identify and quantify. These characteristics have hindered the development of accurate, reliable and timely estimates of severity and impacts and, ultimately, the formulation of drought contingency plans by most governments. Drought severity is dependent on duration, intensity and geographical extent as well as demands made by human activities and vegetation on a regions water supply (Wilhite, 2000).

According to Wilhite (2000) there are four main categories of drought, namely meteorological, agricultural, hydrological and socio-economic. A meteorological drought is expressed solely on the basis of the degree of dryness and the duration of the dry period due to a deficiency in precipitation (Wilhite, 2000). Agricultural drought links meteorological to agricultural impacts such as soil moisture and crop yield, and the impacts are crop specific, for example, with maize there is impaired growth and reduced yields. A hydrological drought is associated with the effects of periods of precipitation shortfall on surface or sub-surface water supply and water storage systems. Hydrological droughts are usually out of phase or lag the occurrence of meteorological and agricultural droughts (Figure 1.2) (Wilhite, 2000). A socioeconomic drought associates supply and demand of some economic good or service with the drought and the impacts on human activities (Wilhite, 2000). A drought-related shortage of crops marks a drought condition according to human needs. Humans can also create a drought situation by means of land-use choices or excess demand for water (Glantz *et al.*, 1997).

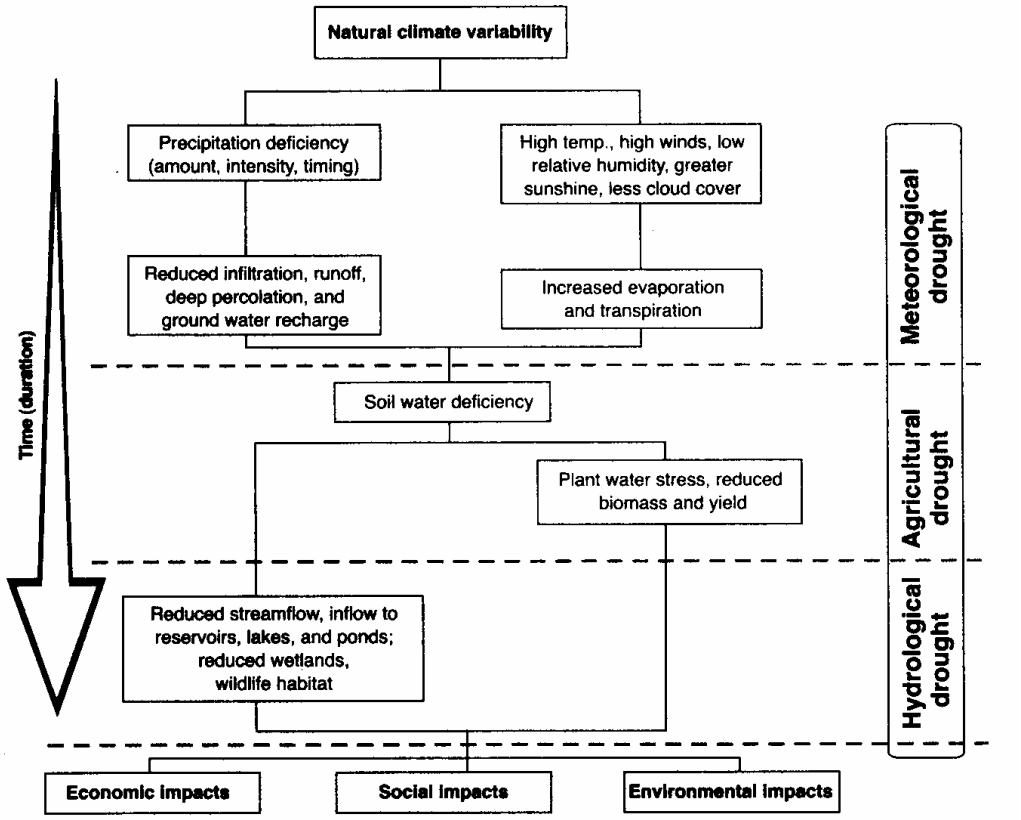


Figure 1.2 The characteristics of the various drought types and how they are related to each other, as well as the different impacts of drought, over time (Wilhite, 2000, p10).

A socio-economic drought is associated with the impacts of precipitation-related reductions in water availability on productive activities (Benson and Clay, 1998). Droughts associated with lower than the expected normal rainfall can result in a range of economic impacts, for example, there may be sharp reductions in agricultural output and related productive activity as well as employment (Benson and Clay, 1998). Due to the meteorological anomaly being an extreme event of intensity and sometimes duration, the enterprises and public regulatory bodies that make economic decisions do not anticipate the deviation and this results in negative impacts on production and the rest of the economy (Benson and Clay, 1998).

1.2.3 Causes of Drought

One of the main causes of drought in South Africa is the variability in rainfall (Mason and Tyson, 2000; Tyson and Preston-Whyte, 2000 and Vogel *et al.*, 2000). The El Niño phenomenon accounts for approximately thirty percent of rainfall variability (Tyson and Preston-Whyte, 2000). Events initiated in the South Pacific Ocean alter the temperature, pressure and wind fields over southern Africa. Different conditions are produced during high phases of the El Niño Southern Oscillation (non-ENSO) and low phases (Tyson and Preston-Whyte, 2000). During the low phase or warm events of the Southern Oscillation, the convergence zone of cloud bands, usually the source of high rainfall, move offshore (Tyson and Preston-Whyte, 2000). The influence of ENSO warm events on rainfall is strongest in the southeastern parts of the subcontinent. As a result these ENSO warm events are frequently associated with drought over much of southern Africa, as was seen with the severe drought of 1991/92 and to a lesser extent in 1997/98 (Mason and Tyson, 2000).

Worldwide drought caused by ENSO may significantly alter a developing country's access to food from donor governments. Research, though, does suggest that although there is a correlation between ENSO events and drought, not all drought events in South Africa can be explained by these teleconnections (Mason and Tyson, 2000; Tyson and Preston-Whyte, 2000 and Vogel *et al.*, 2000). Nations therefore require drought management that incorporates all aspects of climate variability, not only ENSO related variations in rainfall (Wilhite, 2000 and Reason *et al*., 2005).

1.2.4 Vulnerability to Drought

Having described some of the causes of drought, a key factor in effective drought risk reduction is trying to improve the understanding of factors heightening risks to drought. One such factor is vulnerability. Vulnerability is broadly defined as the

potential for loss due to a hazard such as drought, or insecurity in the face of a changing environment. Magnitude, duration, impact, frequency and rapidity of onset all characterize the vulnerability to drought (Cutter, 1996). Risk is the likelihood of occurrence, or probability, of the hazard (Cutter, 1996). Risk usually depends on the combination of the frequency and severity of the hazard and the vulnerability of the people exposed to it (Vogel, 1998). It is often found that an existing hazard is strongly coupled to the vulnerability of the landscape and populations. The more vulnerable a community is, the greater the physical and economic costs that will usually be required when a hazard occurs (Vogel, 1998). The local physiographic, historic and socioeconomic influences of a region are highly significant factors in understanding people's vulnerability to drought (Vogel *et al.*, 2000).

An essential element that is still missing from much hazard research is a detailed assessment of how people respond to and cope with periods of environmental stress (Vogel, 1995). The outcome of strategies to adapt to climate change and hazards may alter the livelihoods of particularly vulnerable groups such as resource-poor farmers. Failure to cope with these changes may result in significant deprivation, social disruption and population displacement (Watson *et al.*, 2001). Efforts are being made to map and monitor vulnerability to periods of drought and also to improve food security in southern Africa (Vogel, 1998). Regular re-assessment of vulnerability is required to ensure that management strategies and post-disaster relief are still appropriate (Benson and Clay, 2003).

Vulnerability assessments are extensively used to delineate, characterize and assess the hazard and the risk of a hazard with an eye towards the development of some mitigation strategy (Benson and Clay, 2003). Vulnerability and risks can be attenuated with good mitigation or they can be amplified by poor or nonexistent strategies (Cutter, 1996). Disasters are those situations where risk has been poorly managed or not managed at all (Vogel, 1998). The normal response to vulnerability in the past has been to reduce exposure, enhance coping capacity, strengthen

recovery potential and minimize damage (Watts and Bohle, 1993). By means of lessons learnt from national drought and agricultural commissions and investigations, vulnerability to drought and risk can hopefully be attenuated in the present.

1.2.5 Drought Impacts

The severe impacts of drought can seriously affect the vulnerability of a people. Impacts such as the availability and price of food are regular vulnerability concerns during drought. The population of South Africa is heavily dependent on agriculture for food supply and livelihoods. Droughts therefore usually have a crippling effect on agriculture and tend to increase vulnerability to such changes (UNDP-BCPR, 2005). Droughts usually require a minimum of two to three months to establish, and can then continue for months or years, often being referred to as a 'creeping phenomenon' (Wilhite, 2000 and Wilhite and Vanyarkho, 2000). As a result of this variation in drought duration, nations should try and improve their knowledge of the probability that drought may simultaneously affect all or several major crop-producing regions within their borders (Wilhite, 2000). Drought may also affect adjacent nations on whom food supply is dependent. Droughts also have a major negative influence on the agricultural share of a countries gross domestic product, due to the effects on rain-fed agricultural production (Vogel *et al.*, 2000).

Severe agricultural losses to commercial and subsistence farmers, reductions in reservoir levels and an increase in the plight of rural communities are regular impacts of drought in South Africa (Vogel, 1994a). During the early 1990s water supply in rural areas was poor and inadequate supply of food was also recorded. The results also included reduced income, food shortages, drastic price increases and soil degradation leading to prolonged reduction in crop productivity (Vogel *et al.*, 2000). Drought disrupts the normal activities of people that depend on the natural environment for food and income, and thus the impacts often last for some time after the drought has ended (Vogel *et al.*, 2000).

The size of farms and the quality of the land also have large effects on drought impacts. Smaller farmers are often progressively affected by poor land quality, an intensification of farming and severe drought impacts. Overgrazing also results in the rapid development of grazing problems during times of low rainfall (Vogel, 1994b). Drought impacts in rural areas are therefore often a result of years of neglect, lack of investment and lack of maintenance than of the drought itself. Effective farm management and the adoption of sustainable agricultural practices can, however, reverse the existing situation to greatly lessen the severe impacts of drought such as food insecurity (Vogel, 1994b).

1.2.5.1 Food Security

Food insecurity can be defined as the inability of people to access adequate food for their needs, and is one of the most serious impacts of drought. Many South African households experience continued food insecurity, malnutrition and unemployment. Approximately 14.3 million South Africans are vulnerable to food insecurity at any given time (Food Pricing Monitoring Committee, 2003). Several causes for the situation can be found in political and economic histories, as well as the current array of factors such as HIV/AIDS and issues of governance. Food alone cannot therefore be the only focal point in a country confronted with numerous compounding factors that enhance food insecurity, situations that are all particularly aggravated during a drought period (Vogel and Smith, 2002).

Drought is a large factor in augmenting food insecurity, and is also strongly coupled to vulnerability to periods of climate stress. Assessments of food security therefore require broader, conceptual analyses to deal with causes of vulnerability. These assessments should be integrated into related regional assessments of global environmental change to improve vulnerability understanding (Vogel and Smith, 2002). The government has the responsibility to reduce vulnerability to ensure that everyone has access to basic food at affordable prices because food security is a fundamental human right (Food Pricing Monitoring Committee, 2003). Much work

needs to be done with regard to food provision and related market factors such as the price of staple foods, especially during a drought.

1.2.5.2 Food Prices

Another impact of drought on the economy is the increase in food prices, which has major implications for food security. Maize is a very important staple food for low-income people and they are therefore seriously affected by price volatility during a drought. Malnutrition and hunger for these low-income groups occur during periods of high prices as they cannot afford the higher prices of food (Chabane, 2003). The volatility in price changes can arise mainly because of two factors. The first is due to variability in natural conditions such as weather, disease and pests reducing the total crop yield thereby increasing prices. The second occurs as a result of a lag between planting decisions and the harvesting of crops. Government intervention to curb price fluctuations is therefore common in industrialized and developing countries due to the natural instability of agricultural markets (Chabane, 2002).

Any policy to raise the market price of maize will, however, have severe impacts across the maize industry. The volume of maize produced and the amount sold on the market will be affected, farmers' demands for production inputs will increase and the ability of consumers to purchase more expensive maize flour will decrease (Chabane, 2002). The price rise will cause a change in the aggregate value for marketed maize as well as for the production inputs purchased. Different participants in the maize market will either experience social welfare gains or losses. Farmers will benefit from the price increase while the consumer will suffer thereby enhancing vulnerability, especially during a drought (Chabane, 2002).

Rising farm input costs can contribute to higher food prices but this is more of a common occurrence in contract farming arrangements. Rising production costs do, however, affect farmers' decisions to plant or to invest in a particular activity as discussed in chapter 3 (Food Pricing Monitoring Committee, 2003). In other words,

should the marginal revenue received fall below the marginal cost of production, farmers may decide against continuing in a particular industry. The domestic supply will thus be reduced and higher prices will be the result causing greater food insecurity concerns that will be enhanced along with vulnerability during drought periods (Food Pricing Monitoring Committee, 2003). The uneven effect of higher maize prices on low-income households, and the subsequent issues of food security during droughts, worsens inequality and vulnerability, and greater steps are required by government to manage and reduce these harmful effects.

1.2.6 Management and Mitigation of Drought

A common argument is that the severity of drought impacts is more a result of the mishandling of drought situations, farm management, and agricultural systems in the country rather than only a consequence of a reduction in rainfall (Vogel, 1994b). Assessments have indicated, for example, that famine situations occur as a result of endemic poverty and poor health conditions in rural areas that are greatly aggravated during drought years (Vogel *et al.*, 2000). Mismanagement and over-exploitation of the land are also responsible for aggravating the impacts of droughts (Vogel, 1994b). Timely and adequate preparedness for and management of droughts, for and by both commercial farmers and the rural poor, have been lacking (Vogel, 1994a).

Over the years, several national drought and agricultural commissions and investigations have repeatedly drawn attention to the problems generated by the exploitation of vulnerable resources (Vogel, 1994b). As early as 1923, for example, drought losses were seen as the result of ineffective veld, soil and water management in South Africa by the Final Report of the Drought Investigation Commission, begun in 1914. These early drought investigations also recommended a reduction in factors aggravating soil erosion such as overgrazing by cattle (Vogel, 1994a). The increase in competition for more limited water resources also resulted in controversial policy decisions being put in place by the 1965 Report on Drought

Feeding. The policy prejudiced against the rural poor as well as crop farmers during times of drought in South Africa (Benson and Clay, 1998). These drought and agricultural commissions and investigations will be further discussed in chapter 4.

Pro-active changes in drought planning and the need for a multi-faceted approach to droughts have been slow in coming to South Africa (Vogel, 1995). The results of several government commissions and investigations of commercial agriculture have shown that sustainable agriculture was not occurring in South Africa. Inappropriate institutional arrangements, farming practices and access to markets were as much a cause of declines in agricultural production during drought periods as was the weather (Vogel, 1994b).

Disaster management has recently become more important in South Africa as improvements around reducing the impacts of drought are slowly prioritized (Vogel *et al*., 2000). Disaster management is a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementing measures to combat disasters (van Zyl, 2006). These measures include preventing disasters, emergency preparedness, rapid and effective response to disasters and post-disaster recovery. The element of disaster risk reduction is also included in disaster management (van Zyl, 2006).

Drought risk reduction aims to increase the likelihood that a household, community or area can anticipate, resist or recover from the effects of a drought without external assistance (van Zyl, 2006). Risk reduction can also be defined as a process of identifying, measuring and assessing risks posed by various hazards. Strategies are then developed to manage the risk of hazards becoming disasters. Reducing vulnerability and drought mitigation are important aspects of drought risk reduction (van Zyl, 2006). Improved adaptation to climate variability by means of appropriate development policies will also reduce drought risk (UNDP-BCPR, 2005).

Mitigation refers to measures taken well in advance of a hazard to minimize the severity or impacts of disasters as well as vulnerability to an expected event. Adaptation to climate variability and drought requires information on various environmental and socio-economic scenarios (Waller-Hunter, 2004). Information could include population size and density, dependence on food imports, the decline of traditional farming and the growing dependence on external markets (Waller-Hunter, 2004). Adaptation may also include general policies and development priorities such as preparedness, climate forecasts and land-use planning and therefore needs to be investigated across a range of scales such as local and national governments (van Zyl, 2006). Capacity-building, public awareness and information provision are all necessary for adaptation to drought and climate variability (Waller-Hunter, 2004).

Some measures that could be considered for drought management and risk reduction include: a better understanding of the nature of drought and the improvement and use of existing agricultural and development structures to maintain a drought plan. Permanent national and regional structures could, for example, continually monitor rural-development issues, commercial farming, soil erosion and veld management, and ensure that timeous assistance is provided (Vogel, 1994a). Drought management could also improve the monitoring of water quality and veld condition to assist in the preparation for and control of future droughts. Increasing the ability of both the farmers and other rural populations to organize themselves in times of disaster by means of improving education and agricultural extension are also effective drought management measures (Vogel, 1994a).

Australia has a very similar climate and continental aridity to that of South Africa. The progress Australia has made in developing drought management strategies are therefore useful indicators of successful lessons for South Africa. Australia has learnt, at substantial cost, that the continental aridity and its associated rainfall variability are real threats to society (Heathcote, 2000). The lesson of the need to

formulate policies around the variable rainfall has been learnt only after the harnessing of technology to try and buffer society against drought, a step that proved to be little more than a waste of time (Heathcote, 2000). Decisions are now based on climate analyses, assessments and forecasts and the use of simulation models for agriculture, commodities and markets are also promoted (Heathcote, 2000).

Agriculture accounts for a large proportion of the economic welfare of Australia. The impacts of drought may be reduced by the continued reduction of the Gross Domestic Product share provided by agriculture, by more off-farm income sources for primary producers, by soil conservation measures and perhaps most of all by the removal of traditional official drought relief policies (Heathcote, 2000). The way ahead in Australia will include better integration between the players in drought policy and management, a more successful evaluation of the policy measures and an improvement of international collaboration around drought (O'Meagher *et al*., 2000). There also needs to be ongoing education of producers around climate variability to better understand the agricultural systems that they manage. They need to know that the government expects them to be more self-reliant than in the past in coping with climate variability (O'Meagher *et al*., 2000).

Finally, improved decision-making is of great importance. South Africa has improved forecasting reliability since the early 1990s. The South African Weather Service has learnt that this needs to be incorporated into decision-making. Information of such fundamental economic value must be easily available in the public domain so as to maximize benefits (Williams, 2000). Accurate weather forecasts over a season can alleviate farmers' fears, reduce vulnerability to drought through preparedness and inform government policy (Blench, 2003). There are also several other methods for reducing drought impacts and many are related to improved drought mitigation among communities. These include a number of socio-economic issues such as reducing vulnerability and risk to drought, improving food security and eventually a reduction in poverty (Vogel *et al*., 2000). Australia

appears to have learnt many lessons around drought in their country such as the ways that forecasts and climate modeling should be used. South Africa can therefore also be more determined in finding alternative strategies to reduce the impacts of drought and ultimately reduce vulnerability too.

1.3 Summary

Droughts have several definitions depending on the areas of the environment or economy affected (Glantz *et al*., 1997). The impacts of drought cause severe problems for the agricultural sector of South Africa as major crop-producing regions are adversely affected. Food security and food prices are therefore also influenced by drought and play an important role in increasing vulnerability (Wilhite, 2000). Interventions by the Government are one of the best ways of dealing with drought, but previous attempts, such as those of 1923 and 1965, have been poor and lacking in appropriate preparedness (Vogel, 1994a). Improvements in drought management and drought risk reduction are required to improve the condition of the agricultural sector and vulnerable communities in South Africa (van Zyl, 2006). In Chapter 2 the methods used in undertaking the research into drought impacts and past and current government interventions to try to reduce the effects of drought will be highlighted.

CHAPTER 2

RESEARCH OBJECTIVES, DATA AND METHODOLOGY

2.1 Research Parameters

South Africa has a broad and well developed agricultural sector (Country Studies, 1997). Throughout the twentieth century agricultural production increased, reflecting the sector's increased mechanization and commercialization (Country Studies, 1997 and National Treasury, 2003). South Africa comprises 122.3 million hectares of which 100.7 million hectares (82.3%) consist of farmland. The area of potential arable land is only 16.7 million hectares or 13.7% of the total area of the country (Ortmann and Machethe, 2003).

Primary agriculture is an important part of the South African economy. As at 2001, there were 50 000 large-scale commercial farmers, 240 000 small-scale farmers providing a livelihood for more than a million of their family members and an estimated three million farmers, mostly in communal areas, who produce food mainly to meet their families' needs (Ortmann and Machethe, 2003). Cereals and grains are South Africa's most important crops, accounting for 60% of the arable farmland during the 1990s. Maize is South Africa's most important crop as it is a dietary staple of most of the population (Country Studies, 1997). Due to the importance of the agricultural sector and particularly maize to many people and

aspects of society in South Africa, the effects of drought can be devastating (Wilhite, 2000). Issues relating to agriculture, such as the supply and price of foods such as maize, are severely affected by the onset of a drought (Food Pricing Monitoring Committee, 2003). The research therefore focuses on the effects of drought on the agricultural sector and more specifically on the production of maize in South Africa.

2.2 Research Aims

Drought has major implications for the agricultural industry by diminishing production, particularly maize (Wilhite, 2000). Throughout the twentieth century, the South African government has had to implement various official coping strategies, such as the Drought Investigation Commission in 1914 and the Report on Drought Feeding in 1965, to try and minimize the damage caused by drought episodes (Vogel, 1994b; Vogel, 1994c and Wilhite, 2000). These Government policies, moreover, have usually been focused on drought alleviation and agricultural aid, and were largely reactive. The result has generally been crisis management whenever a new drought episode sets in (Bruwer, 1989). With improved information such as El Niño prediction and water information, and the organized distribution of this information, Government policy should be able to prepare for drought, reduce societal vulnerability and aid adaptation to climate variation (Dilley, 2003).

As a result of the loss of institutional memory, many lessons from past drought experiences remain to be captured before future improvements can be made. By means of examining the recent drought episodes of 1991/92, 1997/98, 2001/02 and 2003/04 in South Africa, the lessons that have been lost and learnt during and after these events will be shown. The results of the analysis should inform current drought policy initiatives and lead to a better understanding of vulnerability to drought. Questions that are to be answered by the research are:

1. What were the major societal and agricultural impacts of the drought episodes of 1991/92, 1997/98, 2001/02 and 2003/04 on South Africa that can be identified from government sources, written reports and other related documents?

2. How has the South African Government dealt with these drought episodes in the recent past in terms of drought risk reduction, mitigating severity and emergency preparedness?

3. What have been the major lessons learnt and/or lost by government and other role players involved in drought risk management and drought mitigation in South Africa?

The impacts of drought are constantly felt during each drought episode. Trying to find effective policies to best manage droughts so as to reduce the impacts is a key initiative.

2.3 Data Collection

In order to investigate the degree of success of past drought interventions, a range of data was collected to compile a history of past drought. Qualitative data was obtained from newspapers and interviews of farmers. Newspaper articles from October 2003 to April 2004 were retrieved and responses to letters forwarded to Agricultural Organisations and farmers were examined. Secondary data sources including journal articles, internet documents and University publications were used to derive drought impacts. Rainfall data has been obtained from the South African Weather Service. Maize statistics were acquired from the South African Grain Information Service website as well as from the Abstract of Agricultural Statistics. Past government policies were also obtained from sources on the internet, from various journals, from a range of University publications as well as from different Agricultural Departments in South Africa.

2.4 Methods of Data Analysis

First an overview of drought impacts was sought. Rainfall was chosen as the main data source to begin to assess impacts. Maize is extremely sensitive to the distribution of rainfall and therefore is a good indicator of crop response to variations in rainfall. Rainfall also underpins certain drivers of food security due to the reliance of maize on rainfall and therefore a rain shortage could result in less maize being produced (Clay *et al*., 2003).

Seasonal rainfall totals were calculated for the maize season starting May and running through to the next April of every year. Monthly rainfall figures from stations across the country were totalled as seasonal rainfall totals. Provincial seasonal totals were calculated for all provinces except the Western Cape as this is primarily a winter rainfall region where maize is not grown in substantial amounts. The period of provincial seasonal totals starts from the 2003/04 season and extends as far back as the 1989/90 season. The total seasonal rainfall for the entire summer rainfall region of South Africa was also calculated from the 2003/04 season and this was extended as far back as the 1980/81 season for comparative purposes.

The normal rainfall for every month of each province was added together to give a normal rainfall total per province. The provincial normal totals were added together to acquire the normal rainfall total for the summer rainfall regions of South Africa. Seventy-five percent of the normal rainfall totals of the provincial and total summer rainfall regions were found as any rainfall total close to or below this is classified as a meteorological drought (Gill, *personal communication*, 2007). Separate line graphs were then constructed for each province as well as for the total seasonal rainfall of South Africa. The seventy-five percent of normal rainfall lines were constructed as broken lines on their respective graphs. These data compilations and the analysis thereof have been checked with the South African Weather Service to confirm the validity and interpretation thereof.

The production of maize is directly dependent on rainfall and as such maize was also a required data source to examine drought impacts on the agricultural sector. Maize production totals per province were found on the South African Grain Information Service website and the total seasonal maize production for the entire summer rainfall region of South Africa was also calculated. Total areas planted to maize per province were also found on the website and the total area planted for the entire summer rainfall region of South Africa was also calculated. Provincial totals for maize production and area planted were calculated as far back as the 1989/90 season. Total summer rainfall regions were calculated as far back as the 1980/81 season for comparative purposes. All provincial and total maize data were organized into separate bar graphs for maize production and for area planted to maize. Maize data obtained from the Abstract of Agricultural Statistics were also tabulated according to seasons to be easily compared with rainfall and maize graphs.

The various graphs were then analysed to determine the seasons of low rainfall to establish their relation to maize production and also to establish the seasons that proved to be anomalies. Anomalously low rainfall seasons were then further examined. Rainfall and maize statistics, however, do not correlate as would have been expected. All the expected and unexpected results were then compared with government records of the respective seasons. The reason for this is to explain the main reasons for the poor and outlier results as well as the impacts on food security. This is not to imply that maize production is equivalent to food security as food access and utilization are also important. Nonetheless extended periods of low rainfall do drive production down. The responses by the Government were then also correlated with the various graphs and tables to see if government interventions have aided maize production during droughts.

Past government drought policies from 1914 to 1990 were briefly set out and are shown in Table 4.1. Drought policies from 1991 were then examined to determine the effectiveness of recent drought management strategies to reduce risks to

drought, particularly for crop farmers. Annual agricultural documents usually identify drought impacts on food production and food supply only. Related policies involving land tenure and the deregulation of the marketing boards were, however, also examined to try and ascertain how these may have constrained or enhanced the agricultural risk environment within which farmers operate. The compound and complex effects of government on drought were thus examined. The current Disaster Management Act was also inspected to determine changes in government drought management over time. Finally, associated plans and frameworks were also analysed to establish whether the Government had learnt from past attempts at mitigating the severity of drought.

Newspaper articles often act as a good monitor of drought impacts and response as the media can and is often used to disseminate information about an ongoing drought (Monnik, 1998; Baethgen, 2000; Velasco and Broad, 2000 and Wilhite *et al*., 2000). Newspaper articles from October 2003 to April 2004 were collected to determine the amount of information conveyed to the public during a drought, general public and farmer response and concern with regard to government intervention as well as evolving drought impacts. A first impression of the public perceptions of the Government and their attempts at mitigating the severity of the drought could therefore be obtained from media sources.

The opinions of farmers and Agricultural Organisations were also obtained by means of questionnaires distributed to commercial farmers. Most of these agricultural sources are well informed. Mr. Koos van Zyl at AgriSA aided in the selection of these farmers and agricultural heads. The respondents were selected by maize growing provinces and, as they are responsible for the bulk of maize production, were preferred to small-scale farmers. The questions contained in the letters were as follows:

1. Please give your views on three success stories and three failures from past drought management attempts from the 1990s to 2000s.

2. Please list five positive or negative impacts that have arisen from the deregulation of agricultural markets in 1996.
3. Please list five benefits that you believe have emerged from the Governments' more proactive stance on drought since the early 1990s.
4. Outline three benefits that may arise from The National Disaster Risk Management Framework.

The views expressed in the farmer perception section of chapter 5, however, are only those of two Agricultural Organisations. Due to time and transport constraints, no other responses to the questionnaires were received. In order to further this research, additional perceptions of the other maize growing provinces are required. These can possibly be obtained through personal interviews at the various Agricultural Unions of the respective provinces. Personally guaranteeing anonymity can also lead to improved cooperation from farmers and Agricultural Organisations.

As discussed in chapter 5, the responses that were received have pointed out the shortcomings of government and have also made suggestions on improvements that should be made. All of the data and information acquired was then used to find possible methods and techniques to improve drought management in South Africa.

2.5 Summary

Drought has a profound effect on the agricultural sector and on vulnerable communities in South Africa. Continuous and detailed baseline data on drought causes and impacts are few. Data collected, compiled and analysed here has enabled the construction of such baselines. Data shows various drought impacts and the responses and interventions of the Government to droughts. Rainfall and maize data provide important information on how droughts affect food security. Government documents show the successes and failures of recent attempts at reducing the effects of drought. Perceptions of the public and farmers provide further insight. Chapter 3 will assess the impacts of recent droughts in South Africa and show why effective government policies are required to better manage the event.

CHAPTER 3

THE IMPACTS OF DROUGHT

3.1 Introduction

Drought has been noted as having severe impacts on the agricultural sector of South Africa (Wilhite, 2000). The vulnerable populations of the country are the ones that are impacted the most by the occurrence. Maize is the staple food of most individuals in the southern African region and as a result the reliance on rain-fed agriculture is tremendous (Clay *et al*., 2003). Rainfall variability in the region also has serious consequences for agriculture and for food security. The onset of a drought is generally the trigger required to cause large-scale food shortages in the southern African region (Tadross *et al*., 2005).

In this chapter, first and second order impacts of drought as well as factors aggravating these impacts of drought such as food security will be discussed. The first order impacts are food security and the price of basic foods (Chabane, 2003), and the way these factors interrelate and change as a drought progresses will be examined. Second order impacts such as South Africa exporting food to other southern African countries thereby affecting local food security (Chandrasekhar, 2002) will also be assessed. Other second order impacts including the way individual farms are affected by rising commodity prices are also explored. The way these first and second order impacts affect farmers' decision-making strategies will also be examined. Factors aggravating the impacts of drought such as the

HIV/AIDS epidemic (Drimie, 2004) and the plight of small-scale farmers add to the agricultural problems caused by drought as pressure is enhanced for vulnerable communities (Benson and Clay, 1998), and these will also be examined. What follows is an in depth discussion of the above-mentioned impacts of drought, highlighting how drought negatively affects the agricultural sector and the South African population and why effective intervention by government is required.

3.2 Meteorological Effects

Climatic variability is a significant feature of the South African agricultural practice. Maize is highly sensitive to drought and climatic variation, and as a result there is a large emphasis on the understanding and prediction of the El Niño Southern Oscillation (Clay *et al.*, 2003). Climatologists have found that there is a strong relationship between ENSO and the inter-annual variation in rainfall in southern Africa (Reason *et al.*, 2005). As discussed in chapter 1, however, the low rainfall that is experienced across the region is not always associated with the phenomenon.

Total rainfall throughout a season (Figure 3.1) is generally used for agricultural planting purposes as farmers can decide whether or not the forthcoming rain throughout the season will be sufficient for maize production. Focusing on rainfall and crop output provides a greater understanding of past and future consequences of climatic variability as these two factors are strongly linked. Any extended halt in rainfall will usually reduce maize formation dramatically (Clay *et al*., 2003) and therefore the focus is on rainfall as it is closely connected to food security. The lessons learned from past droughts should allow maize producers to become more independent from government support as they will be better able to cope with future climate variability and drought impacts.

Figure 3.1 shows the total seasonal rainfall for South Africa for all provinces except the winter rainfall region of the Western Cape. As discussed in chapter 2 the broken

line indicates 75 percent of normal rainfall as any rainfall total close to or below this is classified as a meteorological drought (Gill, *personal communication*, 2007). The two major drought episodes associated with ENSO are quite clear during the 1982/83 and 1991/92 seasons. The 1997/98 season also had a strong ENSO event connected to it, and climatologists forecasted a severe drought in southern Africa (Clay *et al.*, 2003). The actual rainfall during this period was, however, more favourable than predicted by scientists using only ENSO based models as the ENSO event was not as severe as expected (Reason *et al.*, 2005). Farmers relying solely on this information may have planted less in expectation of rainfall shortages. Drought has devastating effects, but these effects can be worsened by concentrating only on ENSO events. However, as discussed in chapter 1, ENSO is not the only cause of drought in South Africa. Hence, if there is no prospect of an ENSO related drought, it is foolhardy and dangerous to assume that there will be a good agricultural rainfall season. Therefore, an understanding of climate variability is essential in the agricultural sector.

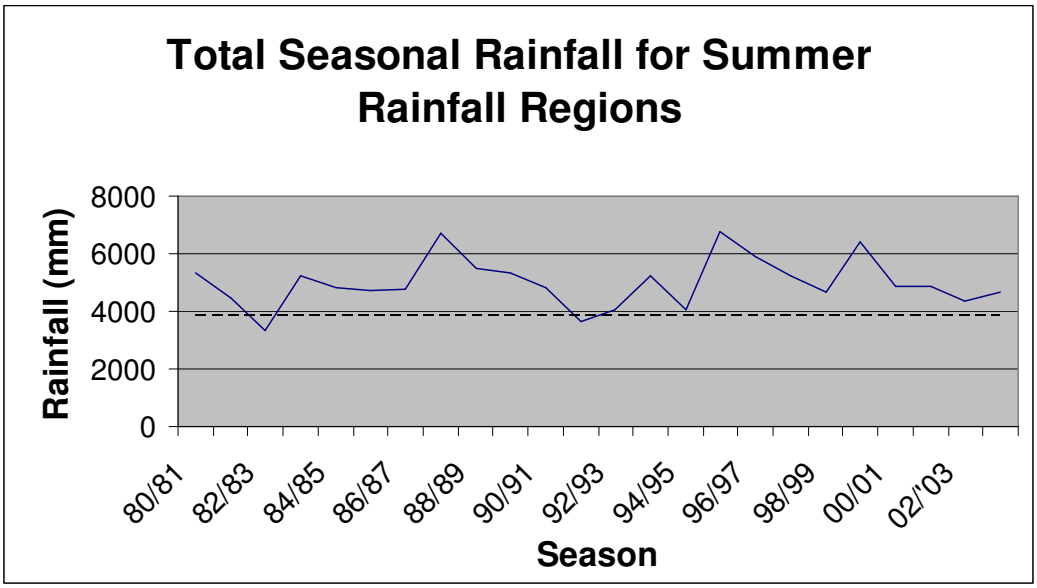


Figure 3.1 The total seasonal rainfall for summer rainfall regions from the 1980/81 season to the 2003/04 season. Broken line indicates 75 percent of normal rainfall (3821mm) (Source: South African Weather Service).

The performance of maize is highly sensitive to intra-seasonal distribution of rainfall, particularly at the time of flowering, which generally occurs in February. Any extended halt in rainfall can cause a considerable reduction in grain formation and a resultant maize yield that is substantially smaller (Clay *et al*., 2003). The onset date of the rainy season is also crucial to subsistence farmers as they need to decide when to plant their maize. Frequent dry spells may occur if planting is too early and intense rains washing seeds away could occur if planting is too late (Reason *et al.*, 2005). The variability in seasonal rainfall characteristics such as onset, cessation and dry spell frequency are harmful to the agricultural sector and especially to the staple food of most South Africans (Tadross *et al.*, 2005).

Many provinces suffer from extremely dry years that do not fall within the general drought periods. The Free State and the North West Province are two of the main maize producing provinces in South Africa. Both provinces were severely hit by the drought of 1991/92 and again in 1994/95 (Figure 3.2 and Figure 3.3). There is also a clear lagged effect between rainfall and crop response as the variability in rainfall during a season can be seen the season after the major drought of 1991/92. An ENSO was not predicted for the 1992/93 season, but due to erratic rainfall throughout the season, the overall rainfall distribution was poor and the maize industry was unexpectedly hit (Glantz *et al*., 1997 and Tadross *et al.*, 2005).

Drought impacts are worst felt when there is a lack of preparation by government to reduce the effects. The creation of drought intervention strategies is dependent on a clear understanding of climate variability and as such efforts need to be made by the Government to gain such understanding. Such intervention strategies will lessen the potentially devastating effects of drought and are therefore of great importance for agriculture in South Africa.

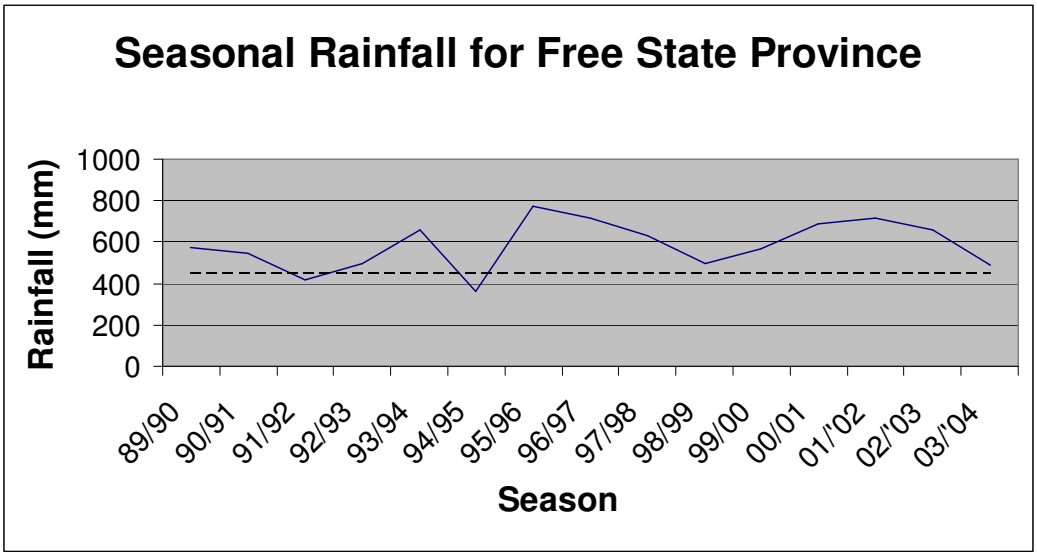


Figure 3.2 The seasonal rainfall of the Free State Province from the 1989/90 season to the 2003/04 season. Broken line indicates 75 percent of normal rainfall (438mm) (Source: South African Weather Service).

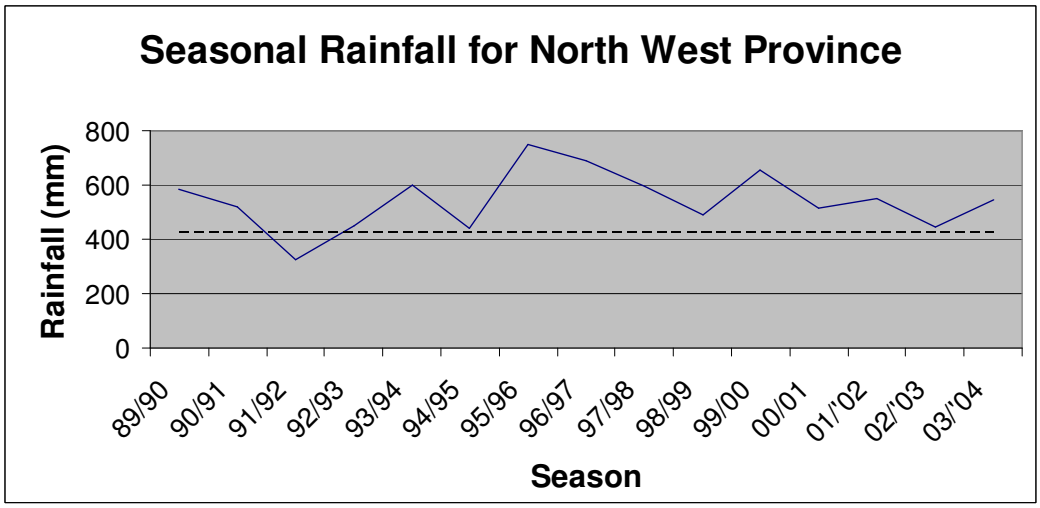


Figure 3.3 The seasonal rainfall of the North West Province from the 1989/90 season to the 2003/04 season. Broken line indicates 75 percent of normal rainfall (412mm) (Source: South African Weather Service).

As has already been stated, ENSO is not the only cause of drought. Relying solely on ENSO information could thus prove costly for farmers when predicting drought (Reason *et al.*, 2005). The point was proven in the 1997/98 season when, based solely on ENSO information, drought was predicted (Mason and Tyson, 2000 and Dilley, 2003), but contrary to expectations, both the Free State and North West Provinces experienced good rainfall. Conversely, in the 1998/99 season there were no predictions of ENSO effects, and therefore above average rainfall was expected. Instead, both provinces recorded rainfall totals close to the meteorological drought indicator. The result was an unexpected dry season resulting in less maize production in these provinces. Since the 2000/01 season, both provinces have recorded lower rainfall figures on average per season.

Climate variability requires adaptation and farmers should accommodate for the possibility of lower rainfall every season in order to be prepared for an unexpected dry season. There are major implications for food security and poverty when climate variability occurs at any level, especially when no precautionary measures are in place (Tadross *et al.*, 2005).

3.3 Food Security

Food insecurity is one of the most important impacts resulting from drought. The inability to feed oneself during a drought is of great concern for governments around the world. Much of the chronic and acute hunger in the world is connected to highly variable rainfall, peaking during drought periods. Due to the fact that the rural economy of South Africa is highly dependent on food production, this population is extremely vulnerable to the drought impacts of crop failure and subsequent decreased income (UNDP-BCPR, 2005). Several adaptations were used to survive during the 1991/92 drought: for example, the rural poor avoided a large-scale famine by increasing purchases from non-aid sources. These were financed by cutting expenditure on agricultural inputs and intensifying non-agricultural income sources. Many of these attempts to finance increased food purchases, however, still

had severe negative effects on livelihoods, and this affected the rural poor in subsequent seasons by increasing their vulnerability to future shocks (Eldridge, 2002).

Vulnerability to future shocks can be broken down into several levels or conditions, each of which results in a different strategy by farmers regarding production and survival. Slightly and moderately vulnerable farmers will maintain their preferred production strategies. Highly vulnerable farmers will disrupt their strategies to cope, such as by farming marginal lands. Extremely vulnerable and at-risk farmers will usually liquidate and abandon production strategies respectively (Washington and Downing, 1999). These vulnerability issues are constantly weighing on the minds of farmers, and play a significant role in their pre-season preparations. The area of their land that they use to plant maize, for example, can change according to the rainfall outlook for the coming season (Figure 3.4 and Figure 3.5).

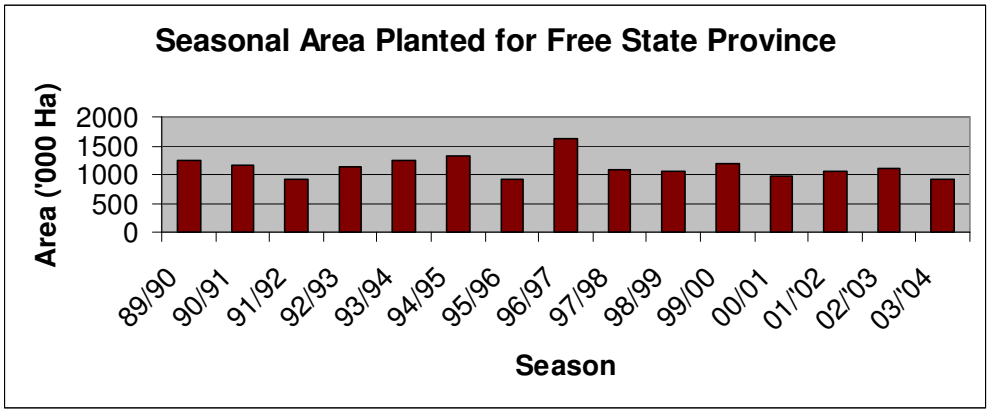


Figure 3.4 The total area planted for maize in the Free State Province from the 1989/90 season to the 2003/04 season (Source: South African Grain Information Service).

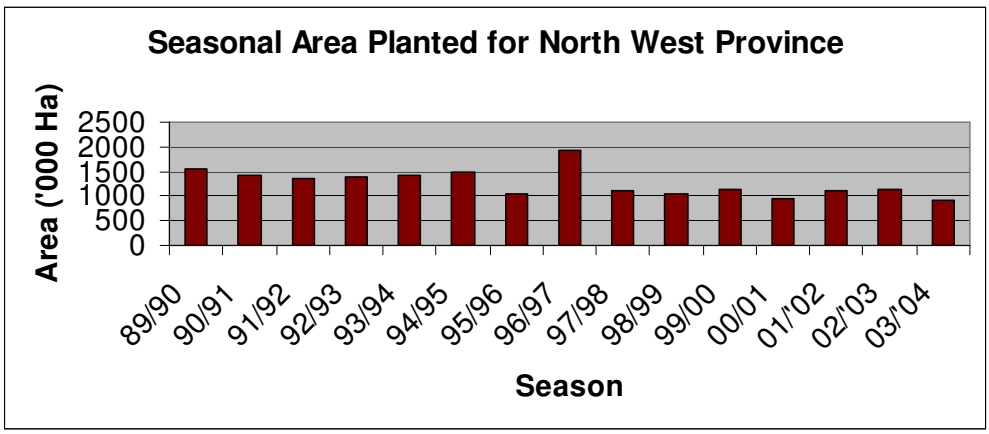


Figure 3.5 The total area planted for maize in the North West Province from the 1989/90 season to the 2003/04 season (Source: South African Grain Information Service).

Farmers represent the largest single group of potential users of forecast information (Monnik, 1998 and Klopper and Bartman, 2003). In an agricultural environment, seasonal climate forecasts could provide valuable information for managing drought risk. In order to have value, however, climate information needs to be understood and used in the decision-making process (Klopper and Bartman, 2003). Greater accuracy and constant monitoring are therefore required throughout a season (Monnik, 1998) as farmers must be able to re-evaluate decisions as new information becomes available (Glantz *et al*., 1997 and Klopper and Bartman, 2003). A poor forecast can result in farmers significantly down-scaling their planting area to avoid extensive revenue losses caused by vulnerability changes during the season.

When we examine farming practice of commercial farmers in South Africa we note that the planting area during the 1991/92 drought changed very little in the Free State and not at all in the North West Province. Drought information was not widely distributed to farmers until the summer rains were already overdue (Glantz *et al*., 1997 and Hudson and Vogel, 2003). The result was low crop yields during

the 1991/92 season as a result of irrigation being able to take over for the lack of rainfall, and very low yields the following season due to a complete lack of water (Figure 3.6 and Figure 3.7). The same problem was again encountered during the lesser drought of 1994/95 when little preventative use was made of climate information (Dilley, 2003). A lack of adjustment of planting area and the resultant large losses reported for maize production are significant reasons for the improvement of early warning systems and forecasts of drought.

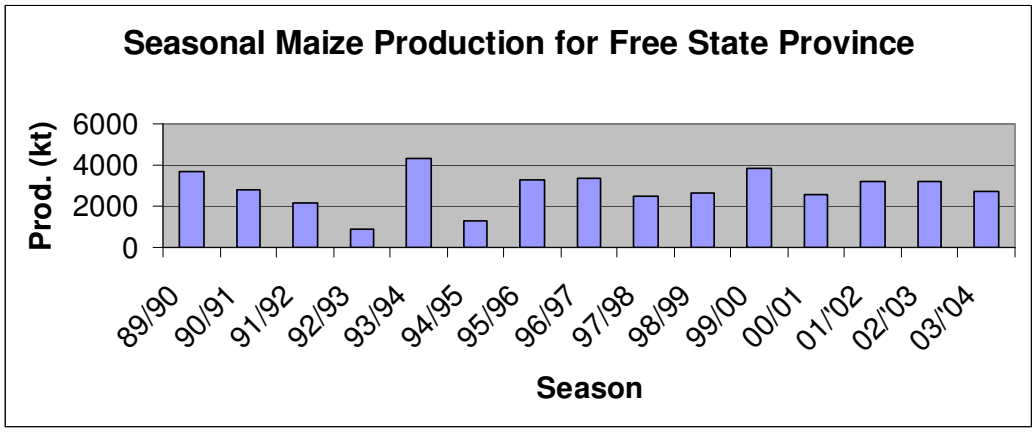


Figure 3.6 Total maize production for the Free State Province from the 1989/90 season to the 2003/04 season (Source: South African Grain Information Service).

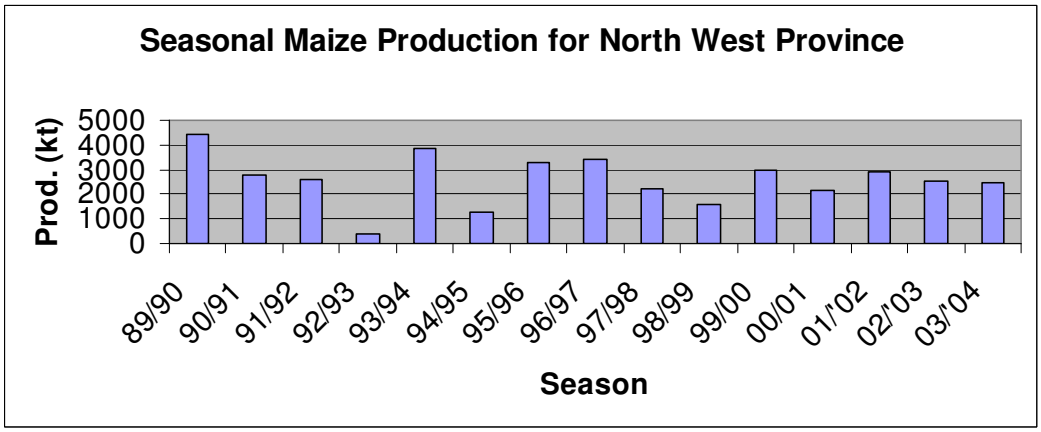


Figure 3.7 Total maize production for the North West Province from the 1989/90 season to the 2003/04 season (Source: South African Grain Information Service).

The use of forecasts is, however, only one tool and is also associated with a number of problems: for example, there is a lack of understanding and use of forecasts. These problems are proven during the 1991/92 and 1994/95 seasons when, due to the slow release of climate information, farmers did not change their planting strategy. According to a survey by Klopper and Bartman (2003), commercial farmers modified their production decisions during the 1997/98 season as a result of the seasonal forecast of an ENSO event. The amount of public interest in understanding ENSO (Dilley, 2003) had by this time allowed commercial farmers to better understand and apply seasonal climate information (Klopper and Bartman, 2003). Since the 1997/98 season the area planted has been stable but less than in the early 1990s as market factors became more important in farmers planting decisions.

3.4 Macro-drivers of Change in the Agricultural Sector

A range of other factors such as the prices of crops also impact on farmers decision-making strategies. Deregulation of the maize market occurred one year before the 1997/98 season and this has meant that prices and production decisions now respond to market forces. Farmers now determine their maize plantings according to fluctuating prices in local and international markets (Chabane, 2002). The liberalization of maize prices and the cost associated with private trade had created a substantial difference in maize values from the start of the harvest season to later in the year (Drimie, 2004). Poor farmers were severely affected as they had to sell maize directly after the harvest at low prices for financial purposes. To meet consumption needs they then had to repurchase maize later in the year at much higher prices (Drimie, 2004). The withdrawal of marketing support can increase the vulnerability and poverty of rural maize producers, especially during a drought (Lambrechts and Barry, 2003).

The massive subsidization of agriculture by developed countries also adds to the vulnerability problem in South Africa (Drimie, 2004). The European Union (EU) is the world's largest subsidizer of agriculture and in combination with high tariffs the

EU policies stimulate agricultural overproduction in Europe. The result is artificially low world prices and the restriction of access for developing country products on European markets. Developing countries are subsequently flooded with cheaper, subsidized goods from European markets thereby creating imperfect competition for local producers (Drimie, 2004).

Farmers in developing countries are prevented from expanding into their own domestic markets and from selling their produce at a fair rate as they are undermined by international competition (Drimie, 2004). The practice and rules of international trade are important in achieving food security and encouraging agriculture (Clover, 2003). African countries need to establish an agro-export economy to trade their way out of poverty, but the tariff barriers and produce dumping by European and United States producers are providing tremendous obstacles (Clover, 2003). Market liberalization and the withdrawal of agricultural subsidies have caused rural economic differentiation and food insecurity to increase (Drimie, 2004). International competition increases vulnerability and this causes severe problems during a drought. Government needs to resolve this macro-driver of change in order to reduce vulnerability to drought impacts.

The increase in prices for the 2002/03 season meant that many farmers were willing to take a risk after the drought during 2001. There was a general ten percent increase in plantings for the season despite the late prediction of a developing ENSO, and a maize yield only slightly above average (South African Press Association, 2002). As a result of farmer empowerment in the market, the effects of the lower rainfall were not as serious as the same conditions would have been in the early 1990s. The low rainfall conditions of the following season though did have an effect on the planting area and the total yield, and this time an increase in preventative measures were required from global market sources.

During a drought event, one of the main ways of dealing with crop shortages and widespread food insecurity is to import maize from international markets

(Lambrechts and Barry, 2003). Due to the drastic reduction in crop yields during a drought season, there are insufficient stocks available for the following seasons' domestic consumption purposes. The result is a large increase in the amount of maize imported during the season following a drought (Table 3.1). The biggest problem in South African maize markets, however, is the amount of maize exported to international markets during a drought, particularly to her southern African neighbours. With the decrease in domestic production and the large amounts of exports, drought and food insecurity are exacerbated, and yet the trend of exporting maize to the rest of southern Africa still continues.

Table 3.1 Maize totals in South Africa in kilotons (Source: South African Grain Information Service).

Season	Total Deliveries	Domestic Consumption	Imports	Exports
1989/90	10681	5506	0	4183
1990/91	7458	5874	0	1239
1991/92	6923	6119	342	841
1992/93	2321	6176	3949	86
1993/94	8188	5836	63	1410
1994/95	10718	5068	0	4629
1995/96	3307	5743	1119	887
1996/97	8560	5604	139	2526
1997/98	9732	6383	109	1921
1998/99	6854	6341	98	1388
1999/00	7075	6362	569	652
2000/01	10409	6657	0	1488
2001/02	7936	7023	395	1335
2002/03	9310	6863	925	1188
2003/04	8409	7128	441	1185

Malawi and Zimbabwe provide two examples of why imports are required from countries such as South Africa. Malawi generally produces enough maize to service the consumption demand of all of her eleven million people (Chandrasekhar, 2002). Floods in 2000/01 and drought the following year, however, caused a reduction in maize output, but the surpluses held from earlier years had been organized to meet such shortfalls. The food crisis during the period from 2000 to 2002 arose due to the IMF-World Bank's debt relief initiative (Chandrasekhar, 2002). The government was forced to sell all of the maize surpluses from earlier years during 2000 to reduce government spending and enhance foreign exchange reserves. The threat of famine and acute dependence on food aid has resulted in imports from South Africa (Chandrasekhar, 2002). South Africa's own food security problems could be a result of policies of the IMF-World Bank.

In Zimbabwe the shortfall in maize has been created by a combination of factors. Erratic rainfall and the shift out of maize cultivation by white commercial farmers due to land seizure have caused food security concerns (Chandrasekhar, 2002). Support from western governments has not arrived as developed countries are not impresses with land seizure policies and as a result the food problem has become serious (Chandrasekhar, 2002). Newly settled land is still being underutilized, farm inputs are lacking and farmers are finding it difficult to access credit at the banks. By 2002 the average farming output was down by about 75 percent from the previous year (Clover, 2003). Lesotho and Mozambique also rely heavily on imports from South Africa. Lesotho has a limited resource base and Mozambique is damaged by its fragmented national market thereby making them prime candidates for imports from South Africa (Lambrechts and Barry, 2003).

The impact of the 1991/92 drought can partly be blamed on the amount of exports made by South Africa to other southern African countries such as those discussed above. Food stocks had been severely depleted, largely as a consequence of exports. The lag effect of drought meant that the amount of crop delivered during the season after the drought was very low. As a result imports spiked to meet the domestic

consumption demands. The drought necessitated imports totaling just less than two billion Rand (Benson and Clay, 1998). Were the amount of maize exported during the drought season reduced, the need for imports and increased spending could have been reduced.

The same conditions are experienced after the 1994/95 drought and to a lesser extent after the 1997/98 drought. Large amounts of exports continued during the drought season, and as a result, greater imports were required the following season to compensate. During 1998 the Southern African Development Community (SADC) stated that exports would continue due to early crop estimates indicating no significant decline in maize yields. The reason for this was that there were sufficient carry-over stocks from the previous season (South African Press Association, 1999). The actual maize yield was smaller at the end of the season, and imports were required the following season due to reduced stocks. The 1997/98 drought may not have been as bad as first thought, but poor planning and insufficient consideration caused a bigger problem than should have occurred.

South Africa exports a lot of its maize to other southern African countries such as Malawi, Zambia and Zimbabwe. When these countries experience shortages during drought, they demand more maize from South Africa. The point where the regional demand exceeds local supply means additional maize must be imported from outside the region (Chabane, 2002). The drought of 2001/02 illustrates this where South Africa could just cope with the event themselves. The rest of southern Africa required support however, and so exports continued with imports increasing the following season. South Africa not only has to deal with its own food insecurity issues, but must continually support other countries needs, thereby increasing spending and also causing serious consequences for local health and nutrition. The export-import trend is another macro-driver of change that requires urgent attention by the Government as local vulnerability is exacerbated leading to further problems during drought.

3.5 Food Prices

Food prices are strongly influenced by drought and the macro-drivers of change discussed above, and ultimately result in food security issues (Chabane, 2003). The price of maize has become an increasingly important factor for farmers to consider when planting maize. The higher the price of maize received for delivery, the more maize farmers are likely to plant. Since 2000 the maize price has played a significant role in crop yields and ultimately in food security. The 2000/01 marketing year (1999/00 production year) produced a large maize harvest with producer prices about average before planting (Table 3.2). At the time of harvest, the producer prices decreased by thirty percent, displeasing many farmers but benefiting the consumer (Watkinson and Makgetla, 2002).

Maize farmers were deliberately more conservative with their plantings for the 2001/02 marketing year. Attempts to avoid low producer prices for a consecutive year as well as unexpected poor weather, resulted in a significantly smaller harvest for the season. The drought conditions meant that South Africa would also export a large quantity of maize to other southern African states. The combination of these factors led to the consumer being hit by large increases in the price of maize (Watkinson and Makgetla, 2002).

Table 3.2 Producer price index for maize and consumer price index for grain products during marketing years as percentages of 1995 (Source: Abstract of Agricultural Statistics).

Marketing Year	Producer price Index	Consumer price Index
1990/91	50,6	55,9
1991/92	59,7	66,0
1992/93	75,6	77,7
1993/94	69,7	86,6
1994/95	64,7	94,0
1995/96	100,0	100,0
1996/97	102,6	112,1
1997/98	98,5	120,5
1998/99	94,9	128,6
1999/00	112,6	136,0
2000/01	91,3	143,2
2001/02	146,6	158,9
2002/03	224,3	199,8
2003/04	201,4	211,3

Maize price increases are worst felt by the urban and rural poor as workers typically spend more than a third of their income on food alone (Watkinson and Makgetla, 2002). The ultra-poor spend up to twenty percent of their monthly income on maize. As a result of the high proportion of spending by the poor on food, rapid increases in food prices have devastating effects on food security and living standards (Watkinson and Makgetla, 2002). Drought does influence the producer and consumer prices, but the impact is amplified by the response to the drought. An increase in exports to other afflicted countries drives the price up, partly due to an increase in imports, as will an increase in farm production costs. The Government

must be aware that the way they respond to a drought can enhance the problem instead of improving it.

The maize price did not experience significant increases from 1997 to 2000. In 2001 the maize price increased dramatically within five months. A few factors could be responsible for this change. The world price of maize, the exchange rate, the relative size of the domestic crop and the availability of maize in the other southern African countries are included (Chabane, 2002). There is a relationship between the maize price and the Rand-Dollar exchange rates. Any depreciation coincides with a maize price increase, and this is exacerbated when there are crop shortages during a drought such as during 2001/02. Exchange rate depreciation tends to increase the level of poverty of already vulnerable communities.

Chronically poor households that are subjected to recurrent shocks such as drought could fall into a long term poverty trap (Devereux, 2006). Most subsistence farmers rely on their own production as well as the market to fulfill their food requirements. When they experience a production shock, they become more dependent on cash-for-food transactions (Lambrechts and Barry, 2003). The threat of repeated shocks can increase the risk of destitution as the time and resources to recover are decreased. Recurrent shocks that lead to asset stripping increase the vulnerability of a population to future risks (Devereux, 2006), and government therefore needs to act to decrease these risks.

Farmers are also aware that a domestic maize shortage will increase prices, therefore farmers will sometimes reserve some stocks for international agencies to purchase for food relief at international prices (Chabane, 2003). Silo owners keep four different types of grain in their facilities: farmers' stock, grain pools, back-to-back contracts and hedge stocks. Farmers' stock and grain pools are controlled by the producer or producers and they can decide when to sell their stock. Back-to-back contracts have the buyer in control of the price of the grain and hedged stocks are controlled by the silo owner. The latter two do not affect the maize market

(Food Pricing Monitoring Committee, 2003). Producers are therefore able to reserve some stocks in silos for future price increases, thereby benefiting from governments desire to aid other countries in time of drought. The effect, however, is to decrease local maize availability, thereby increasing food insecurity and food prices.

The market can utilize certain mechanisms such as hedging on local and international markets and through carrying physical stocks to prepare for food shortages (Drimie, 2004). The government can intervene by selling stocks when prices rise and also to insure against maize shortages as long as the reserves are held nationally. Physical reserves eliminate the risk of high international prices for maize or slow delivery of food imports, but they do make use of precious resources and are subject to potential mismanagement (Drimie, 2004). Due to the openness of the South African economy, the stabilizing effect of international trade outweighs the expense of setting up a grain reserve to provide relief to the poorest households (Food Pricing Monitoring Committee, 2003). Other southern African states may make use of this intervention so as to reduce the dependency on South Africa as long as the reserves are effectively managed.

The South African Futures Exchange (SAFEX) is the price regulating mechanism that replaced the Maize Board in 1996. The Maize Board was a system where the Minister of Agriculture decided on price setting after being lobbied by farmer and processor representatives. The SAFEX system relies on market mechanisms to determine maize prices (Watkinson and Makgetla, 2002). There are a number of supply and demand factors that have an effect on futures prices. These include the weather, government policy, trade agreements and changes in consumer preferences (Chabane, 2002). The development of SAFEX has also relieved the public sector of carrying strategic reserves as the market now generates the price signals needed to allow the private sector to hold stocks (Drimie, 2004). As discussed earlier, however, the potential for the abuse of the system is very real. The gross value of

maize has increased significantly since the establishment of the Futures Exchange (Figure 3.8).

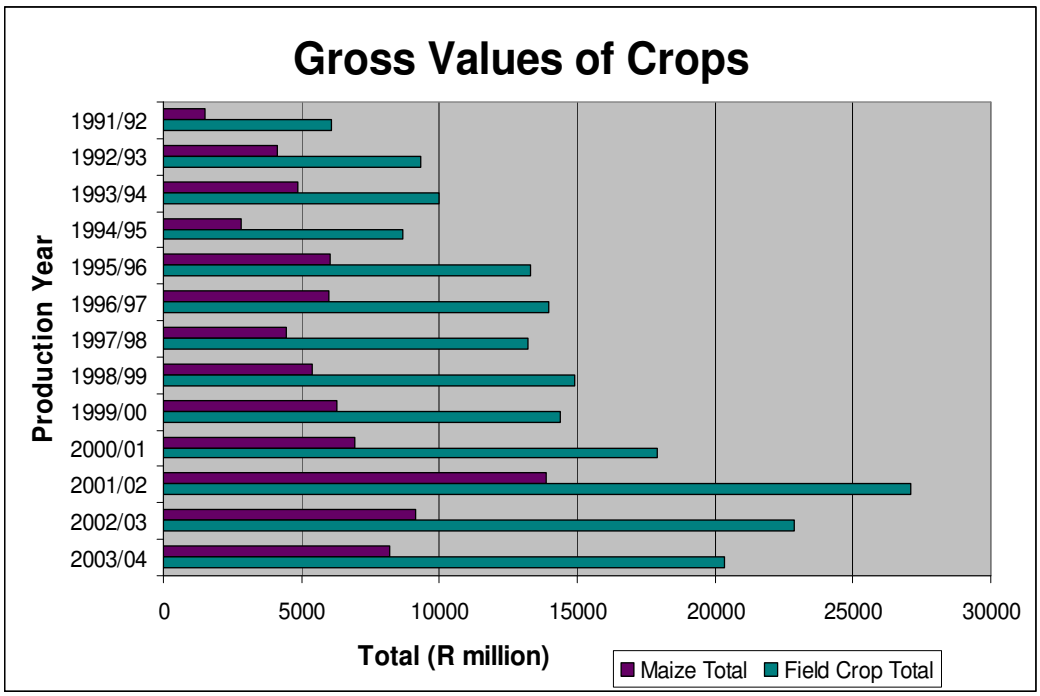


Figure 3.8 The gross values of maize and all field crops (R million) in South Africa since 1991/92 (Source: Abstract of Agricultural Statistics).

The gross value of maize increases gradually through the 1990s. The value does drop during drought seasons, however, due to less maize being produced. Drought causes a decrease in the gross value of maize for the drought season and an increase the season following the drought. The increase in price is thus clearly evident as the decrease in stocks should result in significantly lower gross maize value, but the opposite can only be explained by price increases. The increase in prices may be due to less available stock as well as compensating for import costs of maize from other countries. The 2001/02 season marks a sudden increase in the gross value of maize, but this is not due to a bumper crop harvest. The yield during this season was lower than average, and combined with a depreciating exchange rate, caused heavy increases in prices of all crops. The gross value does decrease after this

season, but due to economic factors not improving to past levels, the prices still remain high as seen during the 2003/04 drought causing further adversity on the poor. Economic stability is therefore an urgent requirement for government to lessen the impacts of drought.

Maize forms a large part of the total amount of field crops produced in South Africa. The levels are reasonably constant at an average of 43 percent excluding drought seasons when maize production decreases. Due to the value of maize not only economically but socially too, there is an essential element that is noted. The vast majority of South Africans rely on maize as a staple food, many of them living below the poverty line. The issue of maize prices is about volatility, and how the livelihoods of people are affected as they struggle to feed themselves and their dependents. The effects of drought on maize prices create further food security problems thereby showing that the Government needs to address drought effectively.

3.6 The HIV/AIDS epidemic

The above analysis highlighted the serious impact that drought has on all dimensions of food security from availability, stability and access, to the increase of food prices. When the aggravating factor of the HIV/AIDS epidemic is also considered, it can be seen how the first order impacts of food security and food prices are even more greatly affected (Clover, 2003). The HIV/AIDS epidemic is eroding the socio-economic well being of households and communities and it is therefore critical for government to understand how the disease affects society. The individuals that are infected are most likely to be at the peak of their productive years and this is associated with a decline in income and food (Drimie, 2004). Most African farmers also farm small plots of land that do not produce enough to meet the needs of their families. The problem is further enhanced by the farmers' lack of bargaining power and the lack of access to land and finance (Annan, 2003).

Many Zimbabweans feel that they were better off during the 1991/92 drought than they are today because there were far fewer people living with HIV/AIDS then (Lambrechts and Barry, 2003). When a productive member of a farming family becomes ill, there is less work done towards farming and the maize yields decline. Other results are that the area of land that is farmed is often reduced or there is a switch to less labour-intensive crops that are less nutritious and are of less value than maize (Lambrechts and Barry, 2003). The death of family members results in agricultural knowledge and farm management skills being lost to younger members of the household. The younger and older members that remain cannot continue farming as before due to a lack of experience or physical strength. Income and food supply decreases as a result of the sale of surplus products and assets at lower prices (Lambrechts and Barry, 2003).

Rural communities feel the impact of the HIV/AIDS epidemic through the increasing number of AIDS orphans and child/women headed households (Lambrechts and Barry, 2003). In southern Africa women are the primary producers for local consumption and the traditional caregivers when family members fall ill. Land often lies untended when HIV/AIDS related illnesses strike a family member (Lambrechts and Barry, 2003). Extended family members are also affected as they care for AIDS orphans when they already have limited income and food supplies. A healthy and balanced diet is essential for people living with HIV/AIDS in order to continue tending to crops. Food shortages associated with drought are weakening their immune systems and accelerating the onset of illness and even death (Lambrechts and Barry, 2003).

In southern Africa the food shortages are exacerbating the ever decreasing health of the population. Those that are suffering from HIV/AIDS can have their lives shortened dramatically as can children suffering from malnutrition (Clover, 2003). At both the household and the government levels, resources are being diverted from food production to health care. The result is food shortages that add to the disease through malnutrition, poverty and inequality (Annan, 2003). The effects on

households are significant as the average affected family in southern Africa is not able to cope with the double burden associated with HIV/AIDS (Clover, 2003). Responding to the HIV/AIDS epidemic can ease the problem, but coupled with drought interventions, the issues of vulnerability and food security can be dramatically reduced by government.

As at 2003, thirty million Africans were living with HIV/AIDS, and in some areas of the continent more than forty percent of the population is HIV-positive (Annan, 2003). HIV/AIDS is not an impact of drought but it is closely associated with the event, as both are related to enhancing food insecurity, especially when drought strikes in an affected region. The relationship between HIV/AIDS and food security is bi-directional. Vulnerability and food insecurity contribute to the risky behaviour that drives the epidemic while the impact of HIV/AIDS increases food insecurity, which again feeds into risk (Drimie, 2004). The onset of a drought exacerbates and accelerates the problem to new levels that require more precious resources and extreme coping measures. Measures to manage drought will therefore be of great benefit in the fight against HIV/AIDS and its related effects.

3.7 Agricultural Impacts

Farmers may appear to be more concerned with profits than with the food security problems of South Africa. The reason for their apparent self-interest is that the prices of agricultural commodities have also increased causing maize farming to become more expensive (Food Pricing Monitoring Committee, 2003). The costs of various inputs will determine how much farmers must spend and therefore whether they are willing to take the risk of using more of the previous year's profits. Drought is a factor that affects farmers not only during the drought season, but also the following season, as the previous year's reduced profits influence the next season's spending. The change in prices of input commodities the season after a drought also affects farmers' decisions. Improving economic stability and reducing

the effects of drought can lessen the concern of farmers over diminished profits and therefore aid in the reduction of food insecurity.

There are several inputs for farmers to consider when preparing for the next season. The factors that need to be considered annually include fertilisers, fuel and packing material (Figure 3.9). Fertiliser products are free from import duties and prices are generally influenced by exchange rates and distribution costs from port to the markets (Food Pricing Monitoring Committee, 2003). The price of fertiliser has steadily increased from the 1990/91 season with no dramatic increases until the 2001/02 season. The abrupt depreciation in the exchange rate caused a large increase in the price of fertiliser and the level remained high thereafter. All scales of maize farming require fertiliser and the price rise affected all farmers, especially the more vulnerable small-scale farmer, during subsequent droughts.

Fuel costs behaved in much the same way as fertilisers as both of these commodities are subject to international pricing. Seed prices follow the same trend, but suppliers also tend to increase prices due to favourable weather conditions and increased demand. Packing material was influenced more by the South African droughts. The prices increased the season after a drought, probably because packaging is produced locally. Due to less stock to package, the price increased to compensate for the decrease in demand. Drought may not be directly responsible for all commodity price increases, but these are more annual factors to consider when looking at crop yields and farmer decisions, and the influence on the poor. The increase in prices of input commodities will lead to an increase in food prices that affects all vulnerable communities and HIV/AIDS sufferers. The problem is enhanced during a drought induced food shortage and therefore the Government has to intervene.

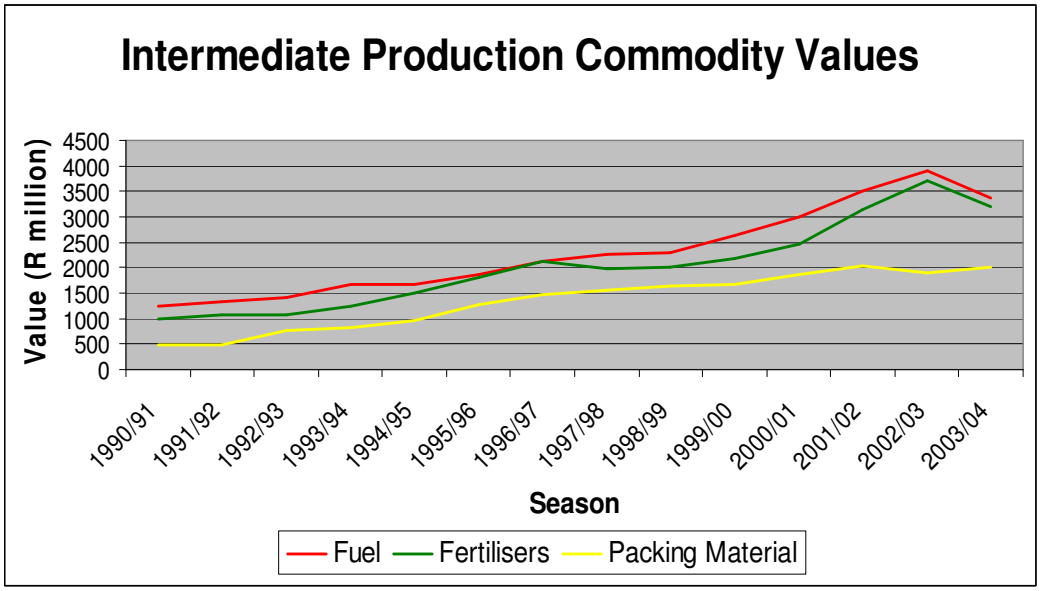


Figure 3.9 The value of certain intermediate production commodities purchased in R million (Source: Abstract of Agricultural Statistics).

Other impacts of drought on the agricultural sector involve farm labour. One of the worst consequences of drought for farmers and their workers is the loss of employment during drought episodes. Estimates have shown that the 1991/92 drought may have resulted in approximately 245 000 people in the agricultural sector losing their livelihoods (Vogel *et al.*, 2000). Permanent employees are less affected by drought than temporary employees. In the past the government has encouraged employee retention by means of large subsidies for farmers. Temporary migrant workers are generally the first dismissals due to drought-related declines in production, though their labour patterns are difficult to trace (Wilhite and Vanyarkho, 2000).

In recent times, an overall decline in agricultural employment has been associated with growing differentiation within commercial farming. Less successful farmers are losing their livelihoods, while larger ones are becoming more prosperous (Watkinson and Makgetla, 2002). Drought causes an increase in debt and an

inability to gain further credit, as subsidies to farmers in debt have also decreased. Emergency measures during drought for farmers under pressure have changed, and the potential for self-employment among rural farmers has decreased (Benson and Clay, 1998). The maize farming industry is becoming more concentrated as large commercial farmers dominate, and small-scale farmers are succumbing to their vulnerability to drought.

Farmers have been forced to rethink their options around agriculture with the way drought is handled in South Africa. Rapidly increasing prices, declines in agricultural employment and concentration among larger commercial farmers have caused many smaller farmers to close their farms or struggle. Drought has a massive impact on agriculture and has been causing severe problems for many decades. The South African government has had a huge role in trying to cope with the effects of drought on the maize farming sector. The policies government should employ to deal with drought ought to impact agriculture in a positive way.

3.8 Summary

Drought has severe impacts on the agricultural sector of South Africa (Wilhite, 2000). Maize is the staple food of the majority of the people of the country, and as a result, the variability of the rainfall causes the food security problem to increase (Tadross *et al*., 2005). Many people are unable to provide enough food for their own consumption, and the crisis is enhanced by the political and social problems in other southern African countries. South Africa needs to aid these affected countries, often adding to the struggle of her own people as a result of food exports (Chandrasekhar, 2002). Food prices are also strongly influenced by drought as less available maize drives the price up as will the necessary imports. The volatility of the maize price during a drought has a serious effect on the livelihoods of people and their dependents (Watkinson and Makgetla, 2002).

The prices of various agricultural inputs also have an impact on a farmer's ability to cope with drought. Small-scale farmers are most affected as much capital was lost during a drought in order to acquire food. Commercial farmers are better able to handle drought situations and as a result there is an increasing decline in small-scale farming (Benson and Clay, 1998). The 1991/92 drought is still seen as the worst drought of recent times, but the expanding population and the HIV/AIDS epidemic is increasing the vulnerability of South Africa (Clover, 2003). Drought is not an independent or direct cause of these vulnerability issues, but it is a trigger that exacerbates existing problems. Having shown the detrimental impacts of drought on agricultural systems and the South African population, it becomes evident why it is so important for government to respond effectively to drought. Chapter 4 will examine the policies government has employed to deal with drought in the recent past as well as those that have influenced the agricultural sector and issues of vulnerability.

CHAPTER 4

GOVERNMENT POLICIES AND PAST INTERVENTIONS

4.1 Introduction

Drought is a severe problem for agriculture and vulnerable communities and most often the best way to cope with a drought lies with the decision-makers of a country (Vogel, 1998). As illustrated in the previous chapter several forces operating at a range of scales can influence impacts and responses to drought. The policies that the South African Government employs to deal with drought have serious implications for the population of the region as well as on operations at a local level (Vogel, 1998). In this chapter some of these past drought interventions at national and local levels in South Africa are described, their successes and failures highlighted and improvements or lack thereof are discussed.

National drought interventions have been occurring for many years but the emphases of these were mainly on relief during a drought (Vogel, 1994c; Vogel *et al*., 2000; Dodson, 2003 and National Department of Agriculture, 2005) (Table 4.1). Prior to the 1990s, there was very little effort around preventing the impacts of drought from becoming more damaging. As a result agriculture suffered heavily during past droughts. By the early 1990s, however, a slow shift in policy from a

more reactive to a proactive approach to drought management became more evident (Bruwer, 1989 and Vogel *et al*., 2000).

Other factors such as the deregulation of agricultural markets that occurred in the mid-1990s have also affected agriculture and drought risk management. The aim of the deregulation policy was to improve market efficiency and to reduce or eliminate government intervention and market control (Groenewald, 1991). Commercial farmers were the main beneficiaries of the new system while the plight of small-scale farmers did not improve, especially during drought (Chabane, 2002). The deregulation of agricultural markets and the positive and negative effects on the agricultural sector will also be discussed later in this chapter.

Despite some changes in drought policy, extensive work was still required on drought management by the late 1990s as a reactive approach was still largely being used by the Government. A revised policy, the Disaster Management Act of 2002, was one of the biggest policy interventions by the Government for a range of sectors including drought management, but there were still some deficiencies. Some of these will be assessed in the latter parts of this chapter. The National Disaster Risk Management Framework of 2005 eventually saw some positive movement towards effective drought management and mitigation and this policy forms the last section of chapter 4 (van Zyl, 2006). Drought events in South Africa have thus seen many policy changes as agriculture and vulnerable communities have been affected in various ways, prompting government to reassess their drought policies.

4.2 The Evolution of Drought Policies in South Africa

The devastating effects of drought in South Africa have had the government attempting to deal with the disaster since the early years of the twentieth century (Vogel, 1994c and Dodson, 2003). The South African Government's concern over soil erosion goes back at least as far as 1914 and continued during the First World War (Dodson, 2003) (Table 4.1). Since this time, the Government has

commissioned several drought investigations and plans leading up to the 1991/92 drought in South Africa. The Commissions and Reports in bold typeface in Table 4.1 will now be briefly discussed.

Table 4.1 Drought research investigations and commissions in South Africa from 1914 to 1990 (Source: Vogel, 1994c).

Year	Commission / Report	Issues
1914	Drought Commission	Examined drought frequency and the problem of drought enhanced erosion.
1923	**Final Report of the Drought Investigation Commission**	**Assessed the problems of poor farm management, kraaling practice and overgrazing. Made recommendations.**
1941	National Provision Against Drought	Researched the spatial extent of drought and relief measures.
1946	Phase Drought Relief Scheme	Drought assistance scheme developed into distinct phases.
1949	Report of the Fodder Bank Committee	Drought insurance schemes suggested for those areas where self-production of fodder not economic, fodder to be stored and distributed to areas worthy of help.
1965	**Report on Drought Feeding (Verbeek)**	**Advised the establishment of a Drought Relief Plan and a permanent Central Drought Committee.**
1968	Drought Planning and Assistance	Comprehensive memorandum compiled as a result of Verbeek Commission and drought of the 1960s.
1968	Interim Report of the Commission of Enquiry into Agriculture	Results of commission include: Farm management needs to be improved, soil conservation systems needed, area and production planning needed.

Table 4.1 continued…

Year	Commission / Report	Issues
1970 1972	Commission of Enquiry into Agriculture Final Report of Commission of Enquiry into Agriculture	Farm systems needed to be adapted to climatic and ecological conditions, agricultural production systems need to be made less vulnerable to drought, granting of financial assistance should be made in accordance to those farmers who show judicious farm management and the use of farming systems suited to natural conditions.
1980	Examination of veld degradation and increased desiccation of the Karoo	No evidence of major climatic change that could have altered plant vegetation growth, major drought impacts incurred by cattle farmers and attention should be given to assist them.
Post 1980	**Proposal of "long-term" drought scheme (Bruwer)**	**Scheme aimed at protecting natural resources. Stock farmers to be self-sufficient in initial phases of drought. thereafter state assist to maintain a herd nucleus.**

The Drought Investigation Commission of 1914 identified soil erosion as a key factor aggravating the impact of the droughts that periodically beset the country's farmers (Dodson, 2003). The recommendations of the Commission's final report in 1923 were for the need to conserve the soil as it is of a limited quantity. Better veld, stock and water management was recommended to reduce factors aggravating soil erosion (Vogel, 1994a and Dodson, 2003). The primary concern of the Drought

Investigation Commission was the white farming areas, and particularly the fate of 'poor whites', rather than the native reserves (Dodson, 2003).

Further drought relief plans and management structures were proposed in the 1960s to address some of the soil conservation and drought issues (Vogel, 1994a). Examples of some policy arrangements included the creation of a Bureau by the proposed Drought Committee. The Bureau would consist of the minimum amount of staff during non-drought periods and these would be increased during emergency conditions (Vogel, 1994a). The focus of the Committee, however, was on livestock farmers with little regard for the condition of the rural poor during droughts (Vogel, 1994a and National Department of Agriculture, 2005).

Many of the responses to droughts have only come about as a result of a need to provide relief to farmers during a drought in order to ease their suffering from the impacts of droughts (Vogel, 1998). Droughts traditionally fell under the domain of the Departments of Agriculture and Water Affairs and Forestry, with farmers receiving relief and assistance from the former. After the 1980s, a phased-relief approach (The Phase Drought Relief Scheme), whereby government provided transport rebates, then loans and lastly subsidies as the drought progressed was replaced (Bruwer, 1989 and Vogel, 1994c). A conservation philosophy was also developed where drought aid was reserved for farms that adopted a conservation approach. Government intervention was generally in the form of assistance schemes, but these led to widespread dependency on the state by farmers (Vogel, 1998).

Past perceptions of drought have seen large financial state payouts and subsidies as necessities to reduce drought impacts. Much assistance, for example, came in the form of debt relief that favoured white commercial farmers (Smith, 1993 and Vogel, 1994c). Little relief was, however, given to black farmers and the rural poor, most of whom relied on agriculture for food security (Vogel *et al.*, 2000). There were few efforts to get farmers to be more independent and proactive and to plan

ahead for themselves. Minority farmers and those not contributing to the country's gross domestic product were not aided as the drought policies focused more on inefficiency and low profitability than food and rainfall issues (Vogel *et al.*, 2000).

There were many who felt the need for a more proactive drought management strategy aimed at risk management rather than crisis management (Bruwer, 1989), and the severe drought of 1991/92 ushered in some profound changes. Drought relief schemes made heavy demands on State funds and the tax payer. Society was therefore demanding a more rational, cost effective and proactive approach (Bruwer, 1989). Changes began through a number of 'driving' factors. A national drought forum, for example, was established to provide emergency response during the drought. The National Consultative Drought Forum facilitated drought relief and provided information on the droughts' progress and drought interventions (Vogel *et al*., 2000). During this period, a severe lack of assistance and development for the rural poor and farm workers was noted, and this highlighted the deficiencies of past drought policies. Attempts were also made at managing vulnerability to drought and encouraging farm and agricultural risk management. Farmers were encouraged to be more self-reliant and to prepare for future drought impacts (Vogel, 1998).

Special attention was also given to water supply systems, communication systems and the implementation and maintenance of a more effective infrastructure. Drought impacts were categorized by health, water supply and agricultural relief needs (National Drought Management Strategy, 1993). A drought strategy task team called the Drought Action Co-ordinating Centre was formed in 1993, and they submitted a drought management proposal to the National Consultative Forum (Vogel *et al.*, 2000). Two years later similar efforts were revived when the National Disaster Management Committee (NDMC) was established at the national level. Calls were made to include disaster management, pre-disaster risk reduction, and an integrated disaster information system at provincial and local levels (Vogel *et al*., 2000).

The progress of an effective drought management strategy to present, however, has been hindered by coordination problems and a lack of ability of those charged with the responsibility of creating an effective strategy (Vogel *et al*., 2000). The inadequacy or absence of community structures that could interact with relief agencies (National Drought Management Strategy, 1993), and early warning systems that could inform relief agencies of impending droughts (Vogel, 1998) also slowed down drought respite measures.

The effectiveness of early warning systems, for example, can be seen by the results garnered in Kenya during the 1991/92 drought (Watson *et al*., 2001). The Kenyans utilized the information from their early warning systems and rapidly translated recommendations into firm decisions thereby averting a major crisis during 1992 (Watson *et al*., 2001). This point proves that early warning systems are effective provided that they are not ignored. Food producers, consumers and decision-makers also need to clearly understand the information contained in the early warnings (Glantz *et al*., 1997). This point is clearly demonstrated by the fact that the majority of the food producers, consumers and decision-makers in South Africa in 1991/92 were not aware of ENSO, or of its connection to regional drought (Glantz *et al*., 1997). This lack of awareness increased the probability that forecast information would be ignored. Another problem as discussed in chapter 3 is that ENSO forecasts were also not regarded as credible during 1991/92 and as a result, individuals who were aware of ENSO were more likely to disregard the information (Glantz *et al*., 1997). Responses to drought provide insight into effective adaptation to climate change, and in 1991/92 a lack of understanding in South Africa was evident by means of poor drought preparation and response.

By 1997 it appeared that ENSO had acquired a significant level of importance amongst decision-makers after being associated with successive droughts during the early 1990s (Dilley, 2003). Sustained efforts by national governments throughout southern Africa to improve capacity to manage climate variability and the major 1997/98 ENSO also raised the level of importance (Dilley, 2003). The

Reconstruction and Development Programme had also stated the need to establish an early warning system in 1994 (Watkinson and Makgetla, 2002). In South Africa the improvements in understanding ENSO and the impacts on food security since 1992 have been good. Information has been obtained by a larger audience and decision makers consider ENSO events in their planning process. Problems still exist regarding forecasts though, such as reliability, delays in availability and a lack of understanding (Glantz *et al*., 1997). These problems were again noted in 1997 in South Africa as another ENSO event occurred. The level of improvement over five years had not been significant enough. There was no sustained effort to advance in ENSO understanding and decision making, and this only occurred when another event was forecast. The saving grace for the government was that the 1997/98 event was not as bad as 1991/92 as the rainfall during this period was greater than expected (Monnik, 1998 and Dilley, 2003).

An Inter-Ministerial Committee for the management of disasters including ENSO impacts was established in 1997 and a Green Paper on Disaster Management was initiated (Vogel *et al*., 2000). In 1999 the White Paper on Disaster Management was published. The White Paper advocated a re-orientation of national disaster management approach from a focus on relief and recovery to prevention and mitigation (van Zyl, 2006). The new approach proposed enhanced disaster risk information and integrating prevention and mitigation in development. The White Paper also proposed reducing the vulnerability of the poor, enhancing community self-reliance in disaster management and a disaster management funding system to be used for the prevention and recovery phases (van Zyl, 2006).

The White Paper set out the Government's disaster management policy for South Africa. All Government institutions and all activities related to disaster management are included in the policy (van Zyl, 2006). The Disaster Management Bill was introduced to the National Assembly in 2001 and The National Disaster Risk Management Framework was implemented in 2005. A definitive method for coping with droughts and disasters seems to be on the agenda, but not at a rapid

enough rate. The time taken for large-scale policies to be implemented is vast, and the eventual efforts are not concise and comprehensive enough. Disaster management appears to be a step-like process where only one idea at a time can be incorporated thus prolonging effective policy and adding extra strain on the agricultural sector as well as vulnerable communities.

4.3 Late 20th Century Agricultural Drought Policies in South Africa

The reactive approach and lack of effective policy by the South African government meant that agriculture was severely hit by the 1991/92 drought. Responses to the drought were only initiated when the rains had failed, crop damage was evident and a reasonable harvest was unlikely due to a lack of any further rainfall (Glantz *et al*., 1997). In South Africa, food shortages tended to be viewed as specific discrete events rather than as a process that had started in early 1991. Decision makers were thus influenced by the type of information they wanted or were receptive to (Glantz *et al*., 1997). The information that appeared unreliable or unimportant was ignored, as they were waiting for hard evidence that the drought had affected the harvest and would result in food shortages (Table 4.2). ENSO information was not seen as credible evidence by decision makers and resulted in food being required from other countries when the harvest failed (Glantz *et al*., 1997).

In 1991/92 early warnings for food security meant that information on food supply and demand was provided. Governments and relief agencies used the information to make plans for the necessary interventions as soon as possible (Glantz *et al*., 1997). Early warnings were based on evidence of actual food deficits and the adverse impacts of drought on crops instead of increasing possibilities that drought-related food shortages could occur (Vogel, 1994a and Glantz *et al*., 1997). Rather than preparing for a potentially difficult season by altering the planting scheme at the beginning of the season, the Government instead waited until the poor progress of the harvest at the end of the season before acknowledging that there could be a food

shortage problem. The inadequate early warning systems from an institutional and management perspective exacerbated the impacts of the drought (Vogel, 1994a).

Table 4.2 The value of imports and exports of maize in R'000 and the percentage of maize against all agriculture (Source: Abstract of Agricultural Statistics).

Year	Imports	Percentage	Exports	Percentage
1991	55 811	2.5%	134 574	2.8%
1992	1 177 144	26.3%	264 607	5.4%
1993	336 890	8.8%	138 846	2.6%
1994	41 122	0.8%	1 617 577	20.1%
1995	412 661	6.0%	566 202	7.0%
1996	283 871	3.7%	1 587 466	13.4%
1997	201 805	2.3%	1 139 661	9.1%
1998	124 224	1.3%	781 529	5.7%
1999	245 035	2.7%	498 469	3.4%
2000	215 963	2.2%	498 675	3.2%
2001	139 676	1.3%	692 061	3.4%
2002	1 117 243	7.5%	1 417 841	5.6%
2003	501 117	3.6%	1 042 369	4.5%

One of the main results of the poor preparation for the 1991/92 drought was a large increase in the amount of imports of food relief (Table 4.2). The value of maize imports increased dramatically during the drought period and comprised a quarter of all agricultural imports. The 1991/92 drought was one of the worst with regard to necessary imports, and yet the lack of awareness is evident during 1991 as the export of maize still continued as per normal. The government has not misjudged the situation to such an extent since 1991/92, but the export trend does continue during subsequent droughts as discussed in chapter 3. During 1991/92 it was clearly evident that efforts to mitigate the impacts of drought before their onset were given

little priority. A system to prepare people for the impacts of a drought was lacking and the responses show that droughts were not seen as a serious long-term economic problem.

The lack of an effective early warning system and the disregard for important information can also be seen during 1994/95. The drought began in 1994, and due to the aid required by the rest of southern Africa, large-scale exports occurred. The result was that South Africa required more maize than was available domestically in 1995. Although the percentage scale is smaller, 2002 appears to follow the same trend as the 1991/92 and 1994/95 droughts. The drought of 2002 saw a large increase in import values as well as export values, probably due to the aid supplied to the rest of southern Africa coupled with the depreciating exchange rate (Chandrasekhar, 2002; Chabane, 2003 and Lambrechts and Barry, 2003). South Africa has adapted slowly to changing climate conditions during the 1990s along with the rest of southern Africa, yet the South African government is still required to aid the other countries. South Africa cannot turn its back on other countries in need, but its own citizens' suffering and vulnerability is often exacerbated as a result of a lack of progress in effective drought management.

By 1997, many economists were pointing out that there needed to be a policy where incentives were given for farmers to more proactively manage drought risk. There was no disaster management strategy and during the previous drought the government was required to intervene at a massive cost (South African Press Association, 1997). A revised White Paper on Agriculture was thus compiled and this included a reassessment of agricultural policy on drought and other disasters. Some of the important objectives included increasing agricultural productivity, opportunities for small- and medium-scale farmers to raise production and incomes and improvement in household food security (National Department of Agriculture, 1998).

The revised White Paper on Agriculture also highlighted the fact that poverty in rural areas is associated with agricultural policies that often marginalized black farmers as their access to resources such as land and credit was reduced (National Department of Agriculture, 1998). As such, the Paper proposed that food security among the poor can be improved by increasing the production of small-scale farmers. Improving livelihoods and employment can help with poverty alleviation and food security (National Department of Agriculture, 1998). There are, however, a few complications with the Paper. There is no mention of how these small-scale farmers will get market access to improve incomes, and how the government plans to help them afford to increase their productivity. One of the biggest factors that the policy overlooks is drought. The way that small-scale farmers are expected to cope when there is a drought is not clearly stated. Without contingency measures, an increase in production could lead to enhanced problems during drought such as increased debt and unemployment.

Another change in the orientation of policy is that government will no longer provide drought relief as done previously. Options for reducing risk will be promoted and government will now reinforce farmers' abilities to deal with risk in a sustainable way. Dependency on the state can thus be reduced as well as environmentally damaging practices (National Department of Agriculture, 1998). The need for change in the South African agricultural sector can be seen when looking at the economic aggregates such as agricultural gross domestic product for the country (Table 4.3). The two droughts in the 1990s prior to 1997/98 have resulted in severe shortfalls in agricultural gross domestic product and cereal yields in South Africa. Government therefore felt that farmers had to be more independent and use their own initiative, as this would improve efficiency during drought. With no relief measures to fall back on, the more resilient farmers will tend to compensate for withdrawals in state aid by becoming more averse to taking risks.

Table 4.3 Growth rates of key economic aggregates from 1990 to 1998 (after Clay *et al*., 2003).

Year	Gross Domestic Product	Agricultural Gross Domestic Product	Cereal Yields
1990	-0.5%	-7.1%	-17.9%
1991	-0.9%	4.5%	5.9%
1992	-2.3%	-27.3%	-52.6%
1993	1.4%	24.0%	129.2%
1994	3.0%	7.9%	19.9%
1995	3.0%	-19.9%	-45.5%
1996	4.1%	24.0%	76.9%
1997	2.4%	2.7%	-8.8%
1998	1.6%	-5.0%	-3.8%

The way government aims to assist farmers and reduce the likelihood of risk involves improved agricultural technology. Technologies and practices that aid in reducing risk to incomes through research and extension will be promoted (National Department of Agriculture, 1998). Diversification of production systems and sources of income for farmers such as developing a range of crops can reduce risk (National Department of Agriculture, 1998). The problem with this idea is that farmers in South Africa may not use any percentage of their maize area for other crops (Washington and Downing, 1999 and Clay *et al*., 2003). Maize is one of the best sources of income, and despite the risk, farmers will not reduce their earnings by planting more drought resilient crops ahead of maize. The end of drought relief by government augments this progression as farmers now require maximum profits to reduce drought risk as well as earn a living.

Another drought risk reduction strategy is to stagger planting dates that may improve alignment with intra-seasonal rainfall. The risk of crop failure due to the

variable climate can therefore be reduced (National Department of Agriculture, 1998). Farmers, however, may see this as income lost should the early rains be good. The dilemma faced by government is that farmers may not comply with the recommendations and thus food security will still be a major issue. The government therefore needs to find a way to persuade farmers to adopt these risk reduction practices without compromising their incomes if they intend for them to be more self-reliant.

4.4 Early 21st Century Reforms in the Agricultural Sector

Since the turn of the century, the South African government has implemented several reforms to try to improve the state of agriculture. These reforms include a Special Programme for Food Security (SPFS), land reform and a rural land and farm tax. These reforms will now be examined further. The Department of Agriculture has developed a Special Programme for Food Security with the support of the Food Agricultural Organisation. The SPFS provides a framework for focusing on increasing production in areas of food shortage, improving supplies and creating rural employment (National Treasury, 2003). The programme aims at increasing food production among small-scale farmers by means of the development of a low-cost irrigation and water management system. The main strategy is to rehabilitate existing irrigation schemes and improve soil and water conservation to increase agricultural production (National Treasury, 2003). The programme needs to be complemented by farmer support services to assist in reducing vulnerability and improving food security.

The provision of the quantity and quality of services required to improve production by poor farmers still remains a challenge. Poor farmers require more direct support from extension services than commercial farmers, and the current service in the former homelands is inadequate. Less than fifty percent of the limited land in the former homelands is used productively and the expertise of extension staff was low (National Treasury, 2003). The level of education and information needs to be

improved and a systematic process must be developed for farmers' needs to ensure that farmer support programmes are well directed. The government has begun a series of reforms to ensure better access for small-scale farmers by improving support services, as food security in rural areas grows in importance (National Treasury, 2003).

Land reform began in 1994 as the government attempted to right the wrongs of the previous government. The progress is slow and agriculture was not a major priority until 2001. The Land Reform for Agricultural Development programme was launched in 2001 and its main priority is the provision of farmland for the previously disadvantaged (National Treasury, 2003). Not much arable land is available for crop farming though, and the government still has much work to do. The peaceful resolution to the land problem would remove uncertainty over property rights and have a positive impact on the sector. The efficient use of commercial farmland should not be compromised in the long term, however (National Treasury, 2003).

A tax on rural land and farms in South Africa could be introduced by the proposed Local Government Property Rates Bill (Ortmann and Machethe, 2003). Commercial farmers are concerned that policymakers do not understand their financial position. The current annual returns to farmland are only five percent of land values and therefore any land tax could cripple many farmers. As it is, commercial farmers in South Africa do not receive the same level of government support received by farmers in the developed countries of our trading partners. Therefore the question is raised as to whether higher land tax rates relative to other countries are necessary (Ortmann and Machethe, 2003).

With regards to reforms, one scenario that should be taken seriously is that of drought. However, this phenomenon has thus far not been effectively considered by policy-makers within their reforms despite concurrent attempts by Agricultural Departments to create disaster plans. As discussed in section 4.3, since the early

1990s government subsidies for farmers during drought were withdrawn. Then in 2002 the tax on rural land and farms was proposed. This tax proposal will cause more problems than it solves, since it could result in many poorer farmers having to quit farming altogether resulting in unemployment, instead of simply becoming more independent from government support. Food insecurity could thus also increase as maize farms decrease, especially during drought.

Land reform could also become more difficult as farms that are able to remain functional will need to increase in size to sustain any living standard. Policymakers need to consult widely with experts and study the impacts of the proposed land tax on commercial farming and the agricultural markets in South Africa. The policies intended to relieve pressure on the agricultural sector during drought appear to have been lacking in several details. Drought and its associated impacts are still causing severe problems for agriculture as the Government slowly attempts to address the issues with poorly thought out plans.

4.5 Deregulation of Agricultural Markets

Another factor that has greatly affected agriculture and drought risk management is the deregulation of agricultural markets. South Africa has had a long history of government intervention and regulation affecting agriculture and regulating access to markets (Groenewald, 1991). Black farmers were legislated against the most due to a desire by government to protect white farmers from competition and to insure a labour supply. By 1988/89 about ninety percent of South African agricultural production was subject to a form of marketing control and supply control. Wherever excessive regulation and state trading occurred, inflation, increased taxation and slow growth resulted (Groenewald, 1991). There were many calls from the agricultural sector for the deregulation of agricultural markets in the early 1990s.

The aims with deregulation can be classified as decreased government expenditure, more efficient markets, improved resource allocation and decentralisation of decision making (Groenewald, 1991). A stage was reached in South Africa where the inflationary effects and some public resistance to market distortions caused politicians to move toward less regulation and freer markets. Entrepreneurs needed to be allowed to make decisions in a competitive society, as efficiency would increase if competition became more prevalent. Government now needed to promote rather than to regulate economic development (Groenewald, 1991). One of the most important reforms in the agricultural sector occurred when the Marketing of Agricultural Products Act was passed in 1996 and the process of deregulation began.

By 1997, producer and consumer prices were being decontrolled and agricultural markets deregulated. Earlier market responses to drought could potentially be permitted with large price increases dampened and the need for large-scale food aid reduced (Benson and Clay, 1998). The most vulnerable groups who will not be able to acquire food at higher prices during drought periods may require support. Governments were urged not to reimpose controls such as export bans or consumer price subsidies during drought emergencies, and to resist large-scale interventions (Benson and Clay, 1998).

Deregulation had made it more difficult to monitor stock levels and import and export plans. Governments in southern Africa were relying less on strategic grain reserves and more on trade to relieve potential food shortages (Harsch, 1998). Many farmers, in fear of drought, could market smaller amounts to retain more for personal consumption, or they might reduce the area planted to avoid major losses. Less information on stock levels made drought more of a hazard for food security, especially since many farmers are unprepared to manage their risks alone (Harsch, 1998).

Even though the role of government has been reduced and efficiency in the agricultural sector enhanced, failures still occur in the operation of some markets. Small-scale farmers are consequently affected, as is their access to production requirements and credit as well as to markets for their produce (National Department of Agriculture, 1998). Relatively few small-scale farmers are surplus producers and only those that can market surpluses have benefited from improved producer prices. The prices for these surpluses are not always favourable though. Poorer farming households remain vulnerable to the higher costs of agricultural inputs as they adjust to the loss of state subsidies (Sayagues, 1997). The suffering small-scale farmer would thus add to the food security problem and hinder government efforts at promoting self-reliance.

The proponents of market liberalization argue that government should still play a role in the initial stages of deregulation, acting as facilitators and providing coherent policies and a stable economic environment (Sayagues, 1997). The state should monitor food stocks, motivate producers, discourage monopolies and encourage private trading by abolishing price controls. Government agricultural extension agencies can also provide information to help small-scale farmers cope with the transition to the new agricultural marketing system (Sayagues, 1997). Deregulation had been idealized for such a long time, yet when it actually occurred there seemed to be a lack of preparation. The deficiency in research appears to have hurt small-scale farmers and the vulnerable population the most, and a drought event would enhance the problem.

Seven years after deregulation occurred, there appears to be several positives and negatives associated with the process. Production efficiency has increased and the agricultural sector has become less capital intensive resulting in increased profits. Foreign trade of agricultural commodities has also increased and the level of food inflation has generally fallen (Chabane, 2002). Commercial farmers have adapted well with their marketing strategies and been innovative in finding markets, such as using futures markets to better manage price risks (Ortmann and Machethe, 2003).

Small-scale farmers could benefit from earning foreign exchange provided they produce export quality products. Maize export earnings have also been boosted by the depreciating Rand (Ortmann and Machethe, 2003). Deregulation appears to have changed agriculture for the better in South Africa as portrayed by the financial gains. The rewards though, may be outweighed by the growing number of negative trends.

The process of deregulation has exposed the vulnerability of farmers in dealing with international competition. Established commercial farmers as well as new emerging farmers are put under pressure (Chabane, 2003). The area under maize has declined from over five million hectares in 1986/87 to 2.7 million hectares currently. Many farmers have converted cropland to grazing to avoid the higher risk of drought (Groenewald and Nieuwoudt, 2003). The effect has been reduced drought exposure in these areas, but food insecurity could increase with fewer farms feeding an ever increasing population. Many small-scale farmers have also been unable to adjust to policy and market changes and have had to leave the industry, hindering government objectives of encouraging the growth of black commercial farmers (Chabane, 2003).

Price volatility also has high costs for low income consumers in terms of food security. The exposure to world markets and the connected exchange rate has had severe effects on the price of maize. The rapid depreciation in the Rand during 2001 caused the price of maize to rise to startling heights (Chabane, 2003). The South African government is looking at a mechanism to stabilize food prices such as maize during food crises or drought. Possible methods include strategic food stocks and funds, released during times of high food prices, to ease pressure on urban and rural communities (I-Net Bridge, 2003). Farmers that have benefited from deregulation would lose the most should government intervene during periods of high prices. Six years after the proponents for market liberalization called for government to still play a role, the government is eventually looking at methods to intervene when necessary to reduce vulnerability.

There are many who feel that the 're-regulating' of the maize market should occur as a result of the persisting negative trends. The balance, however, needs to be found, such as a middle-ground, where the benefits can still be felt and the government intervenes to a certain degree over the negative trends. Price stability and possible anti-competitive practices need to be closely monitored to prevent aggravating rural poverty. Small-scale farmers are still not receiving guidance and many are being forced to leave maize farming. Considering that maize is the staple food of most of South Africa, it would seem that small-scale farmers should be a priority of government. The financial benefits, however, appear to hold the spotlight causing concern for emerging farmers and food security, especially when another drought occurs. Many economic issues have been dealt with, but the issue of agricultural vulnerability during and after a drought still remains a concern.

4.6 The Disaster Management Act

One major development that may accelerate a more risk management approach to drought is the Disaster Management Act of 2002. After the transformation of agricultural markets, the preparation of a Green Paper on disaster management for South Africa began in 1997 and outlined an improved disaster risk management strategy (Vogel, 1998). At the time reactive policies to disasters prevailed, exacerbated by a lack of awareness and communication about structures and plans at higher levels for local authorities. Rural areas were also having difficulties with limited resources and personnel during disasters (Vogel, 1998). There was definitely the need to redraft legislation from the reactive disaster management perspective to a more proactive, risk-reduction, risk management and mitigatory approach.

Disasters were viewed by many as events that occur as a result of poorly managed risk. The Green Paper therefore identified the evaluation of risk environments and vulnerability assessments as a key initiative (Vogel, 1998). The Paper examined how risk was managed at the time and suggested how this could be improved. A

lack of funding for emergency preparedness and disaster prevention and mitigation, as well as limited funding for emergency response, was one of the problems. There was also the need to ensure that risk reduction strategies complemented development in the country, as this was essential for successful disaster management (Vogel, 1998).

The Disaster Management Bill was introduced in the National Assembly late in 2001. The aim of the Bill is "To provide for an integrated and co-ordinated disaster management policy that focuses on preventing or reducing the risk of disasters, mitigating the severity of disasters, emergency preparedness, rapid and effective response to disasters and post-disaster recovery; for the establishment of national, provincial and municipal disaster management centres; and for matters incidental thereto." (Disaster Management Bill, 2001, 2). The Bill appeared to include all the various applications necessary for improved disaster management in South Africa.

The Bill called for the President to establish an Inter-governmental Committee on Disaster Management. The Committee would consist of Cabinet members involved in disaster management, MECs of each province involved in disaster management and representatives of organized local government (Disaster Management Bill, 2001). The Committee in turn must establish a national disaster management framework that should outline a coherent and inclusive policy on disaster management appropriate for South Africa. The framework must also establish prevention and mitigation as the main theme of the policy; facilitate the involvement of the private sector and communities in disaster management; and provide a framework within which the state may fund disaster management and post-disaster recovery (Disaster Management Bill, 2001).

A National Disaster Management Centre will be established to promote an integrated and co-ordinated system of disaster management, with special emphasis on prevention and mitigation. The National Centre must give guidance to all players on ways and means to determine risk and to assess vulnerability (Disaster

Management Bill, 2001). Methodologies must also be created and applied concerning appropriate prevention and mitigation and also integrated with development plans and initiatives. The National Centre should also establish communication links with foreign disaster management agencies to exchange information and assistance. Efforts must also be initiated and facilitated to make funds available for disaster management (Disaster Management Bill, 2001).

The National Centre must also act as a repository and conduit for information concerning disasters, impending disasters and disaster management. An electronic database developed by the National Centre must contain extensive information about disasters that do or may occur in southern Africa (Disaster Management Act, 2002). Information must also be included on aggravations of disasters; risk factors and ways to reduce such risk; prevention and mitigation; early warning systems; vulnerable areas and communities; and research and training facilities for disaster management. The National Centre must also ensure that the electronic database is accessible by any person free of charge (Disaster Management Act, 2002).

Each province in South Africa must also prepare a disaster management plan for the whole province. The disaster management plan for the province must form an integral part of development planning for the province (Disaster Management Act, 2002). The plan should also anticipate the types of disasters that could occur as well as their effects and provide appropriate prevention and mitigation strategies. The plan must also have emergency procedures to be applied in the event of a disaster (Disaster Management Act, 2002). The procedures should provide for the allocation and co-ordination of responsibilities to various role players; rapid disaster response and relief; and the acquisition of essential goods and services. The province must submit a copy of its disaster management plan to the National Centre and to each municipal or local disaster management centre in the province (Disaster Management Act, 2002).

The Disaster Management Act is a vast improvement on previous disaster management initiatives in South Africa and takes into account past concerns and recommendations. The issue of reducing risk is of high importance and the theme of prevention and mitigation runs central through the entire Act. Risk reduction strategies are put in place to complement development in various areas of the country. Structures and plans at higher levels are clearly evident for local authorities so as to aid in the reduction of risk. The various levels of government are also formulating plans in conjunction with one another thereby creating a more effective environment to manage disasters in South Africa.

4.6.1 Deficiencies of the Disaster Management Act

There are still some oversights and details missing from the Act that require attention. There is a small note that disasters should be separated according to type. Couple this to the rarely mentioned emergency preparedness and the issue of food security during drought appears to be as much of a concern as it did before. The main efforts of the Act are focused on risk reduction and prevention, but these do not incorporate the current state of agriculture and stock monitoring in South Africa. The aim might be to reduce the risk of drought, but the decrease in small-scale farmers and the resulting increase in food shortage lead to emergency response during drought. A more proactive stance needs to incorporate all spheres that will be called upon for disaster management. The Drought Management Plan of 2005, which is still under review and will be briefly discussed in the next section, could address these issues.

Risk reduction is incorporated into the disaster management plans of all levels of government. Each level is charged with creating their own plan to reduce risk. The local and provincial levels must then submit their plans to the national level where they will be reviewed. All plans must complement each other so that the national level knows what is happening at the levels below (Disaster Management Act, 2002). There is no mention about what happens after the plans are put in place. The

various levels are left to carry out their strategies until they cannot cope any more and request help from a higher level. The damage may already have been done by a limited local or provincial level and once again the national government requires emergency response. There needs to be a clear outline for effective government coordination so that the levels work together and do not pass the problem on to a less aware level when necessary thereby prolonging effective response.

A disaster is also dealt with by the local government level until it is classified according to a level depending on the severity and magnitude. The disaster must fall within the scope of the Act in order to be classified to local, provincial or national levels. Time will therefore be wasted while the disaster is classified, assuming it is classified, since it may not fall within the boundaries of the Act. The local government will have to handle the situation until the classification is complete. The time taken for classification of disasters may not be significant, but the effects and impacts of the disaster could be enhanced if the local government cannot cope effectively. A higher level of government will have to spend more and deal with a greater problem than was initially necessary. Lower levels of government should have continual access to resources of higher levels of government.

A new disaster management funding system has been introduced. The system will ensure risk reduction initiatives, disaster response and post-disaster recovery are accounted for. According to the Bill, national, provincial and local government may financially contribute to post-disaster recovery and rehabilitation when a disaster occurs. Any financial assistance provided must be in accordance with the national disaster management framework and any policy of the relevant level of government (Disaster Management Act, 2002). The following should also be taken into account: whether prevention and mitigation measures have been taken and reasons for their absence; whether the disaster could have been avoided or minimized had measures been taken; whether it is reasonable to expect that measures should have been taken; the extent of financial assistance available from support schemes; and the financial capacity of the victims of the disaster (Disaster Management Act, 2002).

The financial assistance provided by a national, provincial or local government level is based on sufficient prevention and mitigation measures being taken at the time of a disaster. Should these measures have been lacking, the Act does not explain what the appropriate response should be. The assumption is that large amounts of money will be required for post-disaster recovery. Instead of checking after a disaster has occurred whether or not the relevant measures were taken to prevent a crisis, the government needs to be constantly monitoring the procedures. Simulations could be run to make sure that the correct measures are not implemented too late, or are completely missing from events. Risk and vulnerability will not be reduced if the government only checks their methods after a disaster has occurred and the impacts have taken full effect.

One of the main themes of the Disaster Management Act is that of risk reduction and prevention. The coping mechanism for disasters will be improved if the risk associated with disasters is minimized. The Act, however, appears to contradict some of the other government policies and reforms surrounding agriculture that tend to increase risk. Deregulation has hurt small-scale farmers and potentially increased food insecurity, and will continue to do so without the government monitoring the situation more closely. A potential land tax would cripple agriculture and land reform is progressing too slowly. Farmers also appear unwilling to diversify crops as a result of financial losses. Price volatility of staple foods also occurs during disasters such as drought causing harm to the more vulnerable communities. The government needs to address these issues if the aim of risk reduction and ultimately disaster management are to occur in South Africa. Although the Disaster Management Act is not comprehensive enough, it is at least an improved attempt at reducing the effects of drought on agriculture and vulnerable populations.

4.7 The National Disaster Risk Management Framework

The establishment of a framework for disaster management was proposed in the Disaster Management Act of 2002. The framework would provide for a coherent, transparent and inclusive policy on disaster management that would be appropriate for the whole of South Africa (Disaster Management Act, 2002). The National Disaster Risk Management Framework came into being in 2005. The Framework includes several Key Performance Areas for managing disasters as well as Enablers that would create easier methods for dealing with disasters. The private sector and communities would be included through these Enablers (van Zyl, 2006) thereby advancing efforts to reduce vulnerability.

The first Key Performance Area would be the institutional capacity for disaster risk management. The objective of this is to establish an integrated institutional capacity within the national sphere so that disaster risk management policy and legislation can be effectively applied (van Zyl, 2006). The Intergovernmental Committee on Disaster Management (ICDM) would consist of Cabinet members involved in the management of disaster risk. The National Disaster Management Centre would also fall under this category (van Zyl, 2006) as government tries to include more departments that are necessary for disaster management.

A National Disaster Management Advisory Forum (NDMAF) would also be established to provide a mechanism for relevant role players to consult one another and co-ordinate their efforts for disaster risk management (van Zyl, 2006). The Forum must make recommendations over the Framework to the ICDM and can also advise non-governmental organizations and communities on disaster management. The ICDM and the NDMAF also provide political mechanisms for the national, provincial and municipal governments to co-operate, and for stakeholders from civil society and the private sector to input ideas (van Zyl, 2006). There is also the importance of including communities in disaster risk reduction and in creating a

Southern African Development Community forum for the purpose of disaster risk management co-operation in the region (van Zyl, 2006).

The second Key Performance Area revolves around disaster risk assessment. The objective is to establish a uniform approach for assessing and monitoring disaster risks to inform organs of State and other role players involved in disaster risk management (van Zyl, 2006). Assessments are required for planning an effective disaster risk reduction programme. The assessments would include investigating related hazards and conditions of vulnerability that tend to increase the chances of loss. Disaster risk assessments must also include the participation of vulnerable communities and households and should also set up monitoring systems in all government departments (van Zyl, 2006).

The third Key Performance Area is disaster risk reduction. The objective is to make sure all stakeholders involved in disaster risk management develop and implement integrated disaster risk management plans and risk reduction programmes (van Zyl, 2006). The Disaster Management Act depends on the preparation and alignment of disaster management frameworks and plans to succeed. Disaster Risk Management Plans apply to all levels of government and must show evidence of risk assessments and monitoring, as well as developmental measures to reduce vulnerability (van Zyl, 2006).

Disaster priority setting is informed by the magnitude and frequency of disaster events and the ability of provincial and municipal levels to manage the disaster. Priority must be given to areas, communities and households that have the least capacity to resist and recover from disasters (van Zyl, 2006). Disaster risk reduction focuses on prevention and mitigation as vulnerability and disaster risks are reduced and sustainable development is strengthened. Disaster risk management plans also need to incorporate the elements of preparedness, response and recovery to specific threats or disasters (van Zyl, 2006).

The fourth Key Performance Area is an in depth look at response and recovery. The objective is to ensure effective and appropriate disaster response and recovery (van Zyl, 2006). The means of achieving this involve implementing several strategies. Immediate integrated and appropriate response and relief measures need to be applied when disasters occur or threaten to occur. Rehabilitation and reconstruction strategies following a disaster need to be executed in an integrated and developmental manner. A uniform approach also needs to be employed for the dissemination of early warnings to areas and communities to allow for an effective response (van Zyl, 2006).

Enabler One refers to information management and communication. The objective is to guide the development of a comprehensive information management and communication system (van Zyl, 2006). Integrated communication links must also be set up with all disaster risk management role players to facilitate risk analysis, disseminate early warnings and enable timely and appropriate decision making (National Department of Agriculture, 2005 and van Zyl, 2006). Enabler Two refers to education, training, public awareness and research. The objective is to create education and training programmes related to disaster risk management, and to record and monitor service providers and research programmes (National Department of Agriculture, 2005 and van Zyl, 2006). Enabler Three refers to funding arrangements for disaster risk management. A database needs to be produced that contains all data relating to funding of disaster risk management and records applications and spending to ensure proper usage (National Department of Agriculture, 2005 and van Zyl, 2006).

A Drought Management Plan (DMP) was also drawn up in 2005 as part of the Disaster Management Act and is currently still under review. The main aim of the DMP is for the agricultural sector to develop and maintain an effective drought management capability appropriate to its needs (National Department of Agriculture, 2005). The Plan follows the principles discussed in the National Disaster Risk Management Framework and is aimed at reducing the vulnerability of

farming communities (National Department of Agriculture, 2005). The Plan also notes that the Government should only provide assistance to farmers where sustainable agricultural management is utilized. A strong partnership between government and farming communities is therefore essential (National Department of Agriculture, 2005).

The Disaster Management Act began the process of a more effective policy towards drought in South Africa. The gaps and missing strategies were then filled in by the National Disaster Risk Management Framework. The Framework provides for an efficient means of dealing with the continual threat of droughts. The Framework also appears to be fairly comprehensive in the way that disaster risk is managed from the outset. The previous issues of drought severely affecting agriculture and vulnerable communities are also addressed in the policy. If all the plans are thoroughly adhered to and if National Commodity Organisations are included in the management of disasters in South Africa (discussed in chapter 6), then the Framework does appear to be a realistic means of providing more effective drought protection for the future.

4.8 Summary

Since 1914 the South African Government has been attempting to manage drought. Agriculture was and still is one of the most severely affected sectors mainly because government responses to drought have been reactive rather than preventative (Vogel, 1998). Since the severe drought of 1991/92 there has been a major policy shift from that of reactive to a more proactive approach to drought risk reduction. One of the biggest obstacles was the coordination problems and a lack of ability to manage droughts and their associated impacts (Vogel *et al*., 2000). In 1997 a Green Paper was proposed for disaster management followed by the 1999 White Paper, which proposed that farmers needed to be more independent resulting in drought relief being withdrawn (van Zyl, 2006).

In 1996 the deregulation of agricultural markets occurred as Government intervention and control was decreased (Benson and Clay, 1998). Commercial farmers have adapted well to new marketing strategies but the small-scale farmer has had less success. Many have been forced to leave the industry thereby decreasing the number of emerging farmers supplying maize to communities (Sayagues, 1997). Deregulation has been good for competition and opening world markets, but many within the agricultural sector feel that the Government still needs to monitor the situation and play a small role when it is necessary (Chabane, 2003). Up until this point, drought and agricultural policies had not addressed the serious issues and the way drought impacted on the agricultural sector and vulnerable populations as shown in chapter 3.

The Disaster Management Act ushered in a new era in disaster management for South Africa. There was now more effort and attempts to improve the way that drought was handled (van Zyl, 2006). The Act still has some flaws, but there is a visible endeavor to improve on current strategies. The National Disaster Risk Management Framework was established three years after the Act and succeeded in filling the gaps and missing strategies of the Act. Chapter 4 has shown how government policies and interventions have changed many times since 1991, and often seemed to be half-hearted and unable to attend to the demanding issues. Each policy differed from the last generally by only one small improvement. There was not a comprehensive overhaul of disaster risk management until 2005, which illustrates how much time has been spent on developing effective policy measures. Chapter 5 will examine the 2003/04 drought as it unfolded, assessing drought impacts and whether or not government strategies have improved. Public and farmer perception to change in drought risk reduction are also examined.

CHAPTER 5

THE 2003/04 DROUGHT IN SOUTH AFRICA AS A CASE STUDY

5.1 Introduction

As discussed in chapter 3, the more vulnerable communities, such as those living in rural areas, as well as the agricultural sector experience first hand the impacts of drought. Every time a drought occurs in South Africa these vulnerable populations and farmers are exposed to the devastating effects of drought. One of the main reasons for this is the ineffective drought policies of the Government examined in chapter 4. Most of these vulnerable populations, however, do not blame the Government as they feel that their leaders are aware of their problems. According to an article in *The Star* Newspaper (20 January 2004), "…rural communities expect (their leaders) to deal with (their problems) without any further prodding.". This highlights the fact that these vulnerable populations still believe that the Government will solve their problems as they are unaware of previous drought risk management attempts that were unsuccessful.

At the time of writing this chapter, the most recently documented drought in South Africa was the drought of 2003/04. By making use of case studies from other drought affected regions in the world, the chapter will firstly show that the media is a credible source of drought information. The chapter will then focus on assessing

the impacts of and government interventions for the 2003/04 drought in South Africa making use of newspaper coverage as the primary source of information with the recent developments in drought risk management in mind. The perceptions of the public of government interventions for the 2003/04 drought will also be examined, along with the perceptions of farmers of government drought management attempts since the early 1990s in South Africa, to investigate the degree to which there is a visible measure of change in South African drought management.

In chapter 4, the past drought policies of the government were shown to be largely ineffective in that they were reactionary rather than preventative and only benefited a few, for example, commercial stock farmers. The lack of implementation of previous policies as discussed in chapter 4 has left many more informed members of the public as well as farmers unhappy at the state of drought management (*The Star*, 24 December 2003). The more aware people become over governments' shortcomings, the greater the push from civic society for government to apply more effective drought management strategies.

5.2 International Case Studies of Media Participation

The media plays a major role in keeping all concerned parties including the public informed of ongoing events during a drought. As will be shown, such functions are utilized all over the world and are not unique to South Africa. Varying case studies from two regions of South America will be examined and compared to the situation prior to 2003/04 in South Africa, with regard to the way the media is used by drought management participants during a drought.

Peru had been severely affected by the highly destructive ENSO event of 1983 and therefore a lot of media coverage was given to the predicted El Niño during the preventive phase of June to December 1997 (Velasco and Broad, 2000). Scientific debates bombarded the public with scientific opinion, but no guidance was received

by the public on how to protect themselves. Television and radio coverage of the ENSO event improved, as did the newspaper coverage that was primarily directed to the elite (Velasco and Broad, 2000). El Niño became headline news for two years in Peru, but this was only a temporary situation. El Niño had ceased to be news of current relevance and Peru continues to be without professional reporting of meteorological issues in the media despite being affected three times by ENSO during the 1990s (Velasco and Broad, 2000).

In contrast to the situation in Peru, another example from Southeastern South America is illuminating. The countries of Argentina, Brazil, Paraguay and Uruguay have held forums every four months on climate prediction since the ENSO event of 1997 (Baethgen, 2000). Press reports of the event included a vast range of forecasts produced by individual scientists, many of which were contradictory. As a result, the media were also invited to participate in the forums to understand the role that they can play in disseminating information to the public (Baethgen, 2000). Short training courses would also be organized for the media to understand the potential and limitations of the produced forecasts. The four countries participating in these fora have realized how effective the media can be in improving public awareness and action (Baethgen, 2000).

The situation of South Africa was very similar to that of Peru during 1997/98. High status was given to ENSO forecasts by the media during 1997 (Monnik, 1998). Nearly all media reports associated El Niño with drought, sending out a negative message to the public (Klopper and Bartman, 2003) and therefore causing unnecessary reactions by farmers such as buying haymaking equipment (Monnik, 1998). Guidelines are therefore required to relate information to the media in such a way that it reaches the end user in a factually based manner thereby creating public awareness and improving the understanding of risk reduction (Klopper and Bartman, 2003).

5.3 The Dissemination of Drought Information through Newspapers

Information about drought in South Africa is made available to the general public by media sources such as newspapers. Daily newspapers are able to keep the public informed with regular updates. The impacts of the ongoing 2003/04 drought as well as how the government is responding to the drought are generally the main types of information shared through the media. The public is then able to formulate opinions as to how they are being looked after by their government and what they can do to better help themselves.

One of the main problems with the public receiving information through newspapers is that most of the poor cannot afford to spend money on newspapers or do not have access to 'free' sources of information. The information that is contained is also about the drought at the current time and how the government is responding. The public are not made aware of previous attempts to mitigate the impacts of drought and what preventative measures there are for small-scale farmers.

Dissemination of useful and accurate information to the public does occur through the media during drought but ongoing anticipatory measures also need to be reported before the onset of droughts in South Africa. A case in point is the Disaster Management Act, which is the latest example of the government's attempts to relieve the pressures of drought and create pre-emptive measures to prevent a major crisis during a drought. The Act cited the need for improved early warning systems, enhanced measures for looking after small-scale farmers and generally a more proactive stance on drought mitigation and prevention (Disaster Management Bill, 2001). The 2003/04 drought came two years after the Act was established and proved a useful indicator of any advancements in drought anticipation and risk reduction. The reports found in newspapers during the drought also proved invaluable as to how the public coped and what information was available to them.

As will be shown later in this chapter, newspapers capture public perception on drought. Both the impacts of the drought and the interventions by the Government to alleviate the pressures caused by the drought are reported in the newspapers and these allow for the public to formulate opinions as the drought progresses. These opinions are sometimes good and sometimes bad depending on the perspective and circumstances of the affected individual. The varying perceptions, however, are all related to the way that drought affects vulnerable communities and the agricultural sector as a result of successful or ineffective government interventions.

5.4 The Effects of the 2003/04 Drought from Newspaper Reports

As seen in chapter 3 the impacts of previous droughts have all in some way been related to food security. The issues of food security are usually heightened or exposed during a drought event as the availability of food becomes more of a problem. Important concerns around food security that arise are: the transport and delivery of food; uncertainty over maize planting and production amounts; food price volatility; and increased unemployment and farm closures. These issues are noted in newspaper coverage during the 2003/04 drought and are generally seen as resulting from a lack of preparation from the Government despite the changes in framework to a more risk management approach. The impacts of the 2003/04 drought from newspaper sources will now be further discussed.

Food security provided one of the biggest problems throughout the duration of the 2003/04 drought. Late in 2003 many authorities were hoping the situation would not be as bad as the 1991/92 drought when large-scale imports had to be made. As per *The Star* Newspaper (22 December 2003), "…the deputy chairperson of GrainSA is hoping the situation will not be as bad as in 1992 when the country had to import 4-million tons of maize.". South Africa's annual consumption of maize is 7,8 million tons and there were 2,7 million tons of carry over maize from the previous season. The concern was that Zimbabwe had already imported vast

quantities of maize from South Africa, therefore if no late rains occurred, South Africa would have to import maize again (*The Star*, 22 December 2003).

Authorities within GrainSA also expressed their anxiety over problems regarding food security and the distribution of maize imports as "…Spoornet does not have the infrastructure to bring the maize inland where it is needed." (*The Star*, 22 December 2003). The press notes that railways were poorly equipped to transport maize from harbours such as Durban and East London and often the railway lines were no longer able to carry trains. Many trucks were also being used in other parts of Africa too (*The Star*, 22 December 2003). There was also uncertainty as to whether or not there was a contingency plan in place by the Department of Agriculture to deal with the transport crisis (*The Star*, 22 December 2003). A further shortage in rainfall will lead to a maize shortfall of 5 million tons and result in subsequent imports that may not be adequately distributed (*The Star*, 22 December 2003). The responses by government could be improved should they make use of this investigative potential of the press to prepare in advance for any drought event.

The improved monitoring of crop plantings and expected production amounts still requires attention, especially during a drought, as these issues are critical for food security. Early in 2004 the government cut the planting area forecast for maize. During the previous season 3,2 million hectares were planted and this would be cut to between 2,3 million and 2,5 million hectares (*The Star*, 6 January 2004). The resulting maize crop produced was estimated to be around 6 million to 7 million tons if the rainfall outlook improved, down on the previous season's production total of 9,39 million tons (*The Star*, 6 January 2004). By March, rains had been continuously falling and the forecast rose from 7 million tons at the beginning of the month to 7,67 million tons at the end (*The Star*, 24 March 2004). The end of April saw the expected supply reach a high of 9,85 million tons (I-Net Bridge, 2004).

The late maize supply predictions were a bit optimistic, but due to the late good rainfall farmers were able to salvage a decent harvest of 8,5 million tons from improved planting areas (Figure 5.1 and Figure 5.2). Overestimation of maize supply could still lead to food security concerns and therefore greater accuracy is still required. The maize figures for the Free State and North West Provinces in chapter 3 (Figures 3.4, 3.5, 3.6 and 3.7) show how the area planted to maize and the maize production for the provinces mirror the national results in Figures 5.1 and 5.2. The late rains during the 2003/04 season provided average harvests in both provinces as well as for the national population. As these are two of the main maize growing provinces in South Africa, the way that the national population can rely on certain regions is illustrated, and therefore the accuracy of maize predictions is also required from the provincial level.

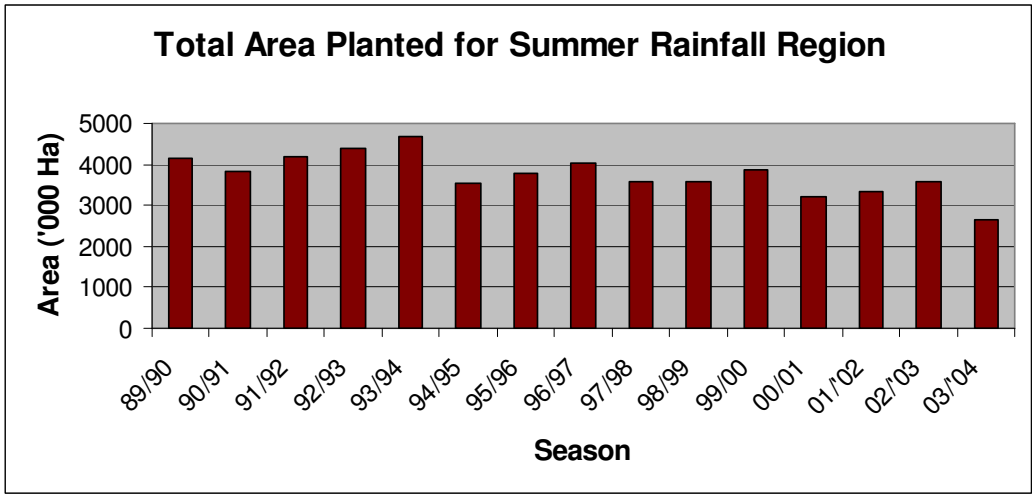


Figure 5.1 The total area planted to maize in South Africa from the 1989/90 season to the 2003/04 season (Source: South African Grain Information Service).

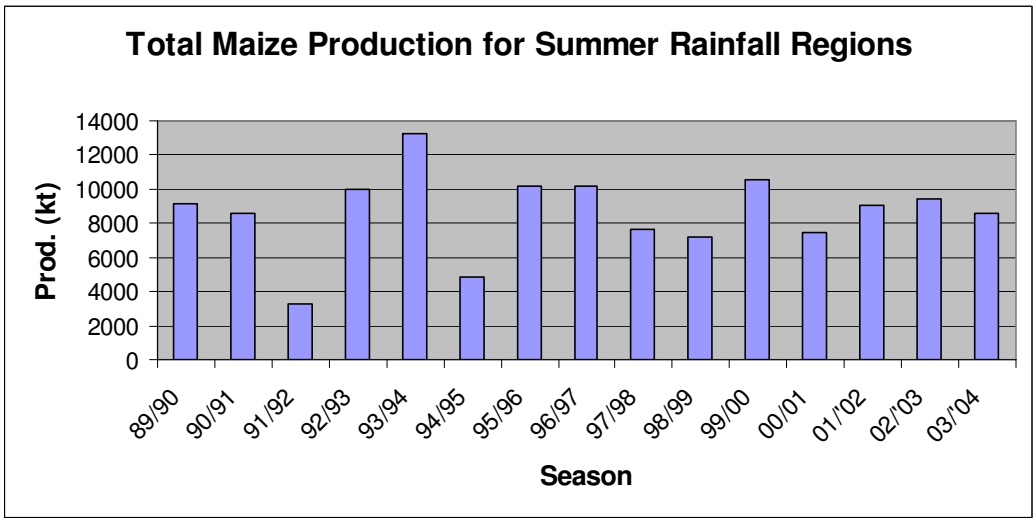


Figure 5.2 The total maize production for South Africa from the 1989/90 season to the 2003/04 season (Source: South African Grain Information Service).

As discussed in chapter 3, the devastating drought of 1991/92 resulted in lessons being learnt by farmers. When it came to planting seed for the 2003/04 season, for example, farmers did not want a repeat of the poor insight shown during the 1991/92 drought. The planting area did improve markedly from early predictions in 2003 and the result was a good harvest that fulfilled the domestic consumption requirements. However, there are still lessons that many authorities need to learn, for example, the reason for the crisis being averted was due to the late rains. Late rains succeeded in averting the potential crop shortage crisis that could have occurred in 2004. Had these timeous rains not occurred during the 2003/04 season there may have been a tremendous catastrophe for which no preparations appear to have been made.

Another impact of the 2003/04 drought, and a continual concern for food security, was the volatility of the food price. Farmers held on to their maize stocks as they were "…waiting for prices to improve." (*The Star*, 26 February 2004). The price of the white maize futures increased rapidly in December 2003 from R960 a ton to

R1302 a ton (*The Star*, 22 December 2003). Shortly after economists stated that lower maize production would not push food prices higher (*The Sowetan*, 21 January 2004), the futures price rose to R1419 a ton (*The Sowetan*, 26 January 2004). By the end of February 2004 Statistics SA released inflation data showing that food prices had increased by 1.1 percent and were already being felt by consumers. Rain during February had seen the futures price drop from R1550 a ton to R1272 a ton, but any decrease in producer price takes about four months to show up in retail prices (*The Star*, 26 February 2004). The end of March saw a further decrease in futures price to R1157 a ton (*The Star*, 24 March 2004), but the economists had already been proven wrong as the poor had to experience food price increases.

As discussed in chapter 3, the droughts that occurred during the 1990s also resulted in other agricultural impacts in South Africa. Likewise in 2003/04, other impacts of the drought noted by the press included increased farm worker unemployment and direct farm consequences, for example, many farmers had to scale down on their fields and those with cattle had to allow their herds to graze on the wilting maize fields (*You magazine*, 17 February 2005). Some also had to move from crop farming to cattle farming and change their fields to grazing land. Other farmers gave up completely and "…left their farms in the past year to work elsewhere as foremen or they [went] to America to drive lorries…" to bring in some much needed income (*You magazine*, 17 February 2005). To alleviate some of the pressure of huge losses incurred by farmers, many farm workers lost their jobs (*The Star*, 20 January 2004). The agricultural impacts of drought during the 1990s appear to have repeated themselves during the drought of 2003/04.

The impacts of the 2003/04 drought were generally the same as they were for the droughts occurring during the 1990s. The drought risk management policies employed by the Government after the 1990s droughts do not appear to have curbed the effects of major droughts in South Africa on agriculture and vulnerable communities. Perhaps the 2003/04 drought occurred to soon after the passing of the

Disaster Management Act of 2002. The press plays a key role in reporting on ongoing events as a drought unfolds. The press could therefore be used by the Government as a preparatory tool to distribute early warnings and drought risk management plans to the public, as opposed to the press simply reporting after the event. The public could then be better informed as to government strategies to cope with the effects of a drought in South Africa.

5.5 Government Interventions during the 2003/04 Drought

As noted in chapter 4, the Government still followed a relief policy during droughts occurring in the 1990s. Despite the changes in policy to a more risk management approach, the 2003/04 drought has once again seen more of a reactionary approach by the Government rather than a proactive one. This point will now be demonstrated through a number of examples noted by the press. In October 2003 the Government allocated R250 million for drought relief (International Federation of Red Cross, 2004). The funds were meant to target flood rehabilitation, provide emergency water supply in poor rural communities, incorporate the drilling of new boreholes, salvaging timber in state farms affected by fires and providing fodder assistance for livestock to both communal and commercial farmers (International Federation of Red Cross, 2004).

Due to disaster being declared in six provinces, emergency funds became available (*The Australian*, 17 January 2004). Limpopo Province had received R33 million, Northern Cape R68 million, Eastern Cape R13 million and the Free State R10 million by January 2004 (*The Sowetan*, 11 February 2004). The money came as a result of the intensity and duration of the drought and was only forthcoming due to emergency relief being required, rather than being made available as a preventative measure.

Late in January 2004 the Government allocated a further R250 million for drought relief (Table 5.1). The total set aside for the purpose of drought aid was thus

brought to R500 million (*The Sowetan*, 26 January 2004). The Government had assessed the situation regarding the impact of drought conditions in parts of the country and had decided to act immediately (*The Sowetan*, 26 January 2004). The additional funds would help in a variety of areas and could include the subsidizing of farm workers' salaries. Substantial amounts would also be spent on emergency relief for rural communities that were worst affected by the drought (*The Sowetan*, 26 January 2004).

Table 5.1 A breakdown of the usage of the R250 million allocated for drought relief in South Africa in January 2004 (after International Federation of Red Cross, 2004).

Amount	Drought Relief Assistance Area
R60 million	Emergency relief to vulnerable rural communities
R30 million	The provision of fodder to established or emerging farmers
R100 million	Water for human consumption
R20 million	Water for livestock
R5 million	The safeguarding of boreholes
R35 million	The prevention of communicable diseases in affected poor rural areas

R60 million of the second R250 million had been allocated to food security and was meant for poor families affected by the drought (*The Sowetan*, 11 February 2004). The idea was to have severely affected households provided with R900 for food over a period of three months, either as cash or as vouchers (*The Sowetan*, 11 February 2004). Provincial and Local Government stated that as a result of the drought there was a greater need for food but the Government does not have unlimited resources. The targeted individuals are small in number as compared to those that require assistance (*The Sowetan*, 11 February 2004). Food security issues become more pronounced during a drought and yet the issue is only dealt with

when a disaster is declared, as has been done during previous droughts. The way that the media can work with the Government to improve the situation by distributing information in a timelier manner will be discussed in a later section.

The Government also proposed calling on financial institutions to reschedule loan payments by farmers affected by the drought. Unless the banks reschedule the loans then the debt farmers will incur as a result of the drought will harm their ability to recover (*The Sowetan*, 11 February 2004). Farmers that are nearing bankruptcy due to repayment of debts had to let farm labourers go. The drought relief afforded by the Government was therefore extended to include farm workers on commercial farms (*The Citizen*, 13 February 2004). Many within the Government questioned the need for drought assistance to farm workers on commercial farms. According to *The Citizen* Newspaper (13 February 2004), "Drought relief of this kind makes little sense while workers are employed and getting salaries.". The funds could surely be better utilized in many other poor areas such as the vulnerable rural regions. The Government is not only reacting once the drought has begun, but they also appear to be providing relief to those that do not require it. This shows that the Government is not assessing the situation properly.

Only after the allocation of the first R250 million for drought relief did the Government commission an analysis on the impact of the drought. The analysis should have been done prior to the allocation of money, and preventative measures should have been in place if a risk management approach was being followed. A national drought mitigation plan was also to be developed (International Federation of Red Cross, 2004). This drought mitigation plan instructed government to act in an integrated way to reduce the impact of the drought by providing emergency relief, fodder and water (International Federation of Red Cross, 2004). The previous drought in South Africa was during 2001, over two years before the drought of 2003/04. Thus, even if one does not include the time elapsed since the droughts of the 1990s, the Government would still have had plenty of time to construct a

mitigation plan for future droughts. The Government appears to act only when droughts occur instead of in a way that prevents a disaster from happening.

Apart from the R500 million that the Government allocated to drought relief in South Africa, there was also the possibility of another R500 million being allocated in the next financial year (*The Sowetan*, 26 January 2004). The money would be considered for long-term measures of drought relief. The measures included "…improving the country's early warning capacity that will help plan advance responses to minimize the impact of future droughts." (*The Sowetan*, 26 January 2004). The move to improve the capacity for long-range weather forecasts would enhance the ability to plan future drought responses and provide sufficient warning for the poor and farmers alike (*The Sowetan*, 26 January 2004).

The problem is that after every drought occurs, improvements on early warning systems are proposed. However, these improvements tend to remain in the proposal stage and are seldom improved. In the Disaster Management Act of 2002 early warning system improvements were proposed, but were insufficiently implemented over the two years leading up to the 2003/04 drought. There was a great desire to improve many aspects of how drought was responded to and to improve preventative measures such as long-range weather forecasts. However, it appears that since the Disaster Management Act was proposed, nothing has yet been done about drought management in South Africa. The Act called for prevention and mitigation as the main themes but the 2003/04 drought caught many decision makers unaware. Since the prevention aspect had not occurred, a mitigation plan needed to be developed during the drought as the impacts of the drought had worsened considerably. A further problem is that government is only considering the investment and may not continue with the plan should the 2003/04 drought be classified as small-scale. The result would be a repetition of the events during another drought in the future.

Another proposal of the Government during the 2003/04 drought involved the setting up of executive, provincial and municipal co-ordinating committees. The committees would involve key social partners and would aim to make interventions effective (*The Sowetan*, 26 January 2004). This would require local and provincial governments to act on their own until they needed the national government to intervene. This proposal had also been previously suggested in the Disaster Management Act of 2002 (Disaster Management Bill, 2001). The Disaster Management Act appears to have been a means of acquiring time until the drought of 2001 had passed. The same proposals are made during the 2003/04 drought because preventative measures are still not in place. The only difference is that these proposals were made public and now the average individual will be expecting results. The way that the Government handles drought in South Africa does not appear to have changed even though a more proactive approach was adopted during the 1990s. The perceptions of the public on the impacts of the 2003/04 drought as well as the government interventions to reduce the effects of the drought will now be discussed followed by the perceptions of farmers.

5.6 Public Perception

The media is an effective way of conveying information to the less privileged and also of obtaining their thoughts on current events. Such is the case of those living in the rural village of Tshavhalovhedzi in the Limpopo Province (*The Star*, 20 January 2004). During the days of the Bantustan regime the leadership of the government lived in the rural areas. The ministers were chiefs that had to return to the rural areas on the weekends (*The Star*, 20 January 2004). As per *The Star* Newspaper (20 January 2004) "…the government is an urban phenomenon with city-slicker leaders who have no inkling of the daily drama and trauma caused to the rural poor by drought.". The leaders are able to live in the cities where most of the water is channeled while the poor rural communities struggle each day (*The Star*, 20 January 2004).

The serious lack of food and water in these rural areas is an issue that is not often highlighted by the urban media. The rural communities do not bring their plight to the attention of the media because they believe that their urban based leaders, like their leaders of old, are aware of their problems (*The Star*, 20 January 2004). The rural communities do not realize that "…this does not happen, because the political leadership does not spend time in rural areas." (*The Star*, 20 January 2004). Rural communities are a direct contrast to commercial farmers who are organized and are able to put their plight on to the national agenda (*The Star*, 20 January 2004). Most of the rural areas produce their own food and a drought has serious implications for farming and food security. The Government needs to consider these areas and revise their reactionary approach long before another drought occurs.

Commercial farmers may appear to be the large beneficiaries of government intervention and drought relief measures, but they too use the media to convey their opinions on drought in South Africa. Many towns in the country have arisen as a direct result of agriculture in the area (*You magazine*, 17 February 2005). The consequence is that not only do farmers suffer due to the drought but so does the entire community. Commercial farmers are grateful for the drought relief grants that they receive but know that not much can be done with R2800 a month (*You magazine*, 17 February 2005). They have to consider cashing in endowment policies and pension plans to continue farming. Others have given up farming altogether to avoid bankruptcy thus causing the agricultural sector to shrink (*You magazine*, 17 February 2005). Again it is clear that the reactionary approach by the Government is not enough and preventative plans need to be established to significantly reduce these negative effects of drought.

Many Government Ministers of minority parties also make use of the media to convey their dissatisfaction with the current state of affairs (*The Star*, 24 December 2003). They cannot understand "…why, if the ANC Government had an inkling of what was coming, they did not put any procedures in place to deal with a drought." (*The Star*, 24 December 2003). Agricultural planning relies heavily on scientific

reports and global experts on weather patterns and yet there appears to be no advancement in the area (*The Star*, 24 December 2003). Large sectors of the population are unable to afford paying more for imported food but if nothing productive is done soon then our valuable farmland will become barren, which will force the country to import food, which in turn will place large sectors of the population under great financial strain (*The Star*, 24 December 2003). Not only is there growing discontent amongst the general public, but Government Ministers are also unhappy with the lack of progress and unfulfilled promises. The farmers that produce the food required by the population are also unimpressed with the policies that government employs.

5.7 Farmer Perception

Policies utilized by government during recent droughts initially provided optimism but have since disappointed most of the population, especially the farmers. Agricultural Groups provide an informative look at how government policies affect the agricultural sector. According to Free State Agriculture, the Department of Agriculture has adopted a positive attitude in performing timeous investigations when there are signs of a threatening drought (Free State Agriculture, *personal communication*, 2007). LandCare projects are also beneficial to drought management as they ensure sustainable resource management and promote the conservation of natural resources within communities (Free State Agriculture, *personal communication*, 2007).

The agricultural sector still feels that there are some failures from past drought management attempts. The Department of Agriculture does not have a clear non-discriminatory drought policy, as emerging commercial farmers receive more support from government than do established commercial farmers (Free State Agriculture, *personal communication*, 2007 and van Zyl, *personal communication*, 2007). Even so, there are still not enough funds to properly support these emerging commercial farmers during a serious drought (Free State Agriculture, *personal*

communication, 2007). Black economic empowerment initiatives are also overlooked in favour of emerging commercial farmers thereby hindering the objectives of further developing established black commercial farming. All levels of commercial farming are also suffering during drought due to the poor infrastructure in South Africa not allowing easy and rapid transport of produce to markets (Free State Agriculture, *personal communication*, 2007 and van Zyl, *personal communication*, 2007).

The Deregulation of Agricultural Markets in 1996 has also seen both positive and negative impacts on farmers in South Africa. The positive impacts are that firstly the policy allows the market to determine the price of agricultural products (Free State Agriculture, *personal communication*, 2007). Secondly, the removal of government involvement in the marketing of agricultural products has also been beneficial to the sector as farmers can now make decisions in a competitive market (van Zyl, *personal communication*, 2007). Thirdly producers are profiting from being able to market their produce globally (Free State Agriculture, *personal communication*, 2007). Fourthly the establishment of SAFEX is seen as one of the most important positive impacts of the deregulation process due to the price forming and marketing exchange processes introduced by the system (Free State Agriculture, *personal communication*, 2007 and van Zyl, *personal communication*, 2007).

The agricultural sector is also being negatively impacted by the deregulation process. Firstly the price of maize can reach extremes on either end of the scale, i.e., during favourable climatic times with surplus crop the price will drop, whilst during a drought the price will rise and could reach record prices (Free State Agriculture, *personal communication*, 2007). Secondly, the lack of a workable and balanced import policy for certain grains makes it nearly impossible for farmers to earn a living with the low import tariffs. Red meat, for example, offers the necessary protection to producers with a 40 percent import tariff (Free State Agriculture,

personal communication, 2007 and van Zyl, *personal communication*, 2007) and it would make sense to implement a similar policy for grains.

Thirdly, as seen in chapter 3, the subsidies paid to farmers in other countries make it extremely difficult for farmers to compete on international markets. Farmers feel that the Government is more focused on protecting consumers from high prices than on helping producers (Free State Agriculture, *personal communication*, 2007). The demands by those within the agricultural sector for the Government to correct certain aspects of the policy appear to be justified.

Since the 1991/92 drought in South Africa, the Government has adopted a more proactive stance toward drought. Several benefits have emerged for farmers as a result of the change in policy. The Department of Agriculture has an open-door approach whereby established and emerging farmers can put forward their views and ideas (Free State Agriculture, *personal communication*, 2007). The improved investigations of possible droughts as well as the use of modern technology, such as satellites, to determine drought areas have helped farmers tremendously (Free State Agriculture, *personal communication*, 2007). The Drought Committee of the Department of Agriculture plans to use a questionnaire on a monthly basis to receive feedback on climate and agricultural conditions at ground level from Organised Agriculture (Free State Agriculture, *personal communication*, 2007 and van Zyl, *personal communication*, 2007).

The National Disaster Risk Management Framework of 2005 is one of the latest policies employed by the Government. Farmers can benefit from the policy because they now understand when they can expect support from the Government during a drought. A 30 percent reduction in normal rainfall will require the farmers to manage the drought themselves by applying good agricultural practices, but a 50 percent reduction will see government involvement and drought support (Free State Agriculture, *personal communication*, 2007). The Framework might aid insurance companies in developing different policies that farmers can use to manage their

risks (Free State Agriculture, *personal communication*, 2007). The Framework can be of great benefit to farmers as long as it is implemented effectively and adhered to by all concerned (van Zyl, *personal communication*, 2007).

Farmers and Agricultural Groups also formulate perceptions of government as a result of the policies and how they are affected by them. Certain impacts of the Deregulation of Agricultural Markets as well as the discrimination between established and emerging farmers appear to be the biggest concerns for farmers that need to be addressed. Farmers do feel that certain elements such as the use of modern technology and the improved communication with the Department of Agriculture have helped with the reduction of the effects of drought. The National Disaster Risk Management Framework also has valuable potential for effective drought management and risk reduction. As shown in chapter 2, the outcomes of the responses were limited. They do, however, show that some farmers are of the opinion that further improvement is still required for better drought management in South Africa. The role that the media could play in assisting government with disseminating drought risk management plans to farmers and the public before the onset of a drought and improving drought preparation will now be discussed.

5.8 The Potential Role of the Media

As has been shown throughout this chapter, the use of drought information supplied by the media can prove invaluable for farmers and the public. However, timelier and more useful information can provide tremendous assistance for the process of drought management and risk reduction. The way that the process of drought planning can be reported by the press through news releases and informational meetings (Wilhite *et al*., 2000) will be assessed in this section as lessons can be learnt from the Southeastern South America case study.

The press can report on the process of drought planning. There are several themes that should be emphasized in the press coverage during and after the drought

planning process. The first is how the drought plan is expected to relieve the impacts of drought (Wilhite *et al*., 2000). Articles can focus on the human dimensions such as the effects on farmers and on the economic effects such as the costs to the agricultural sector. The second theme would cover the cost and funding to implement the options of the drought plan (Wilhite *et al*., 2000). A third theme would relate to the changes people might need to make in response to the drought such as when to irrigate crops (Wilhite *et al*., 2000). Vulnerable communities and the agricultural sector need to improve their awareness of drought and of drought management plans.

At the beginning of drought-sensitive seasons, the public need to be reminded of the plan's existence and informed of possible water and crop impacts later in the season (Wilhite *et al*., 2000). During a drought the media can keep the public informed as to the status of valuable resources such as water and also how victims of drought can access assistance (Knutson *et al*., 1998). All relevant information should constantly be made available to the public in order to prove effective for proper drought management (Wilhite *et al*., 2000).

The role that the media can play during a drought could be invaluable for the reduction in effects felt by communities. The Government, however, needs to work with the media in reporting critical plans before and during a drought, as this was still shown to be lacking during the 2003/04 drought in South Africa even after the poor use of the media for the 1997/98 ENSO event. The media provides a rich source of information on drought impacts and management plans (Baethgen, 2000) and should therefore be used more by the Government to keep the public informed and to reduce the effects of drought on vulnerable communities and the agricultural sector.

5.9 Summary

The impacts of drought can be devastating as discussed in chapter 3, but the lack of effective government intervention and prevention of disasters is of equal concern. The Government has proposed several policies to improve drought situations for vulnerable communities and farmers as examined in chapter 4. The Disaster Management Act proposed in 2001 provided many good prevention and mitigation points, but as noted in this chapter, these were not in place by the drought of 2003/04. Instead the Government merely appears to repeat proposals during subsequent droughts to allay the fears of farmers and the public (*The Sowetan*, 26 January 2004).

The media and especially newspapers provide an extremely useful tool for conveying information to and from the people that need it most. Most of the citizens of South Africa appear to be unhappy with the way that the Government is neglecting drought preventative measures in the country. As per *The Star* Newspaper (24 December 2003), "…now we have leaking reservoirs and drying dams – as if we really need such things as drought starts frying our country.". Many areas receive drought relief but it is often not enough or fairly useless without the necessary preventative measures that should have been put in place. Those living in rural areas still trust that their Government will solve their problems, but all of them feel that the time to develop proper preventative and mitigation plans is now and not during the next drought (*The Star*, 24 December 2003).

Although farmers have felt several benefits of changes in policies since 1992, they still feel that improvements are required to remove more of the risk associated with farming in South Africa (Free State Agriculture, *personal communication*, 2007). The media has made many people aware of the Governments' promises and, unlike with past droughts in the country, these promises now need to be fulfilled with the media playing a key role in disseminating information. Public and farmer perceptions of government and drought management provide useful insight that can

aid in future drought policies. Chapter 6 will examine methods and techniques the Government should use to improve current drought management and mitigation so that public and farmer confidence can be restored.

CHAPTER 6

DROUGHT MANAGEMENT AND MITIGATION

6.1 Introduction

In chapter 3 the devastating impacts of drought were assessed to show why government response is required and the Governments' previous drought policies were then examined in chapter 4. Chapter 5 then investigated the public perception of drought and government intervention and how farmers and the public are unimpressed with governments' recent attempts. In chapter 6, methods for improving drought management and mitigation are analyzed to supplement existing policies, and to improve the state of agriculture and vulnerable populations during drought. Managing droughts effectively is key in the process of reducing the harmful effects of drought on vulnerable communities (Washington and Downing, 1999).

Most rural households depend on agriculture as their only source of food and thus when a drought occurs these communities are often left without their livelihoods (UNDP-BCPR, 2005). In the past the attempted interventions were mostly reactive as they occurred only when the drought had already begun and this led to those at risk relying on the government for assistance during drought (Vogel *et al*., 2000). During recent droughts the emphasis has changed to a more proactive stance as risk reduction became a priority and many felt that interventions should start well in

advance of any drought (Vogel *et al*., 2000). In this chapter the techniques to improve current management of droughts before their onset are examined.

The vulnerability of the population and the impacts of drought are closely linked as a reduction in the level of vulnerability will reduce the way that droughts affect communities (Watkinson and Makgetla, 2002). Early Warning Systems need to be improved as a valuable means of preparing for drought and thus reducing risk (Clay *et al*., 2003). Government policies are one of the most effective ways of preparing for droughts and thereby reducing vulnerability and risk (Knutson *et al*., 1998). The Government therefore has a crucial role in the management and mitigation of drought as the policies they implement have tremendous consequences for the agricultural community (van Zyl, 2006). Droughts are a constant natural threat and the improvement of how they are managed will make their onset less disturbing.

6.2 Alleviating the Impacts of Drought

The causes of drought impacts are often not direct, and many of the physical, economic and social impacts have been shown to arise as a result of a weakened resource base (Vogel *et al.*, 2000 and Wilhite and Vanyarkho, 2000). As shown in this report, the economic impacts of drought for commercial farmers can be attributed to the structural organization of agriculture in the country as well as to the unpredictable weather. The impact of drought years on agriculture are therefore increased by poor farm management such as overgrazing and soil loss as well as by agricultural practices such as pricing policies and structural changes in agriculture (Benson and Clay, 1998 and Vogel *et al.*, 2000).

The impacts of drought are thus added to by physical and socioeconomic factors and these need to be determined when assessing local drought impacts (Wilhite and Vanyarkho, 2000). The impacts of a drought are therefore region specific depending on the activities and practices employed within the region. Hidden and induced impacts are also required when assessing drought impacts, as is an understanding of

the interaction of a variety of causative factors (Vogel *et al.*, 2000). The direct impacts of a drought will only appear during times of low rainfall but the factors that induce certain impacts can be managed during the more prosperous times thereby reducing vulnerability.

Problems with development coupled with drought have been shown to result in the negative drought impacts during past droughts. The rural poor are the main focus of these development problems and consequently the most severe drought impacts (Vogel *et al.*, 2000 and UNDP-BCPR, 2005). The giving of short term drought relief as in the past creates situations of dependency and slows down development. The reduction of vulnerability in the long term should be where measures to mitigate drought impacts should focus. Long-term drought preparedness is an important aspect of the management of drought but should also not be counter to or hinder development (Cutter, 1996 and Vogel *et al.*, 2000).

The economic costs of a severe drought in southern Africa will be a massive reduction in maize and agricultural production, the impact of which will need to be carried by South Africa (Clay *et al.*, 2003) as seen with the macro-drivers of change in the agricultural sector. The international community as well as the SADC countries need to take these impacts into account in preparing for country level economic strategy and aid policy discussions. Rainfall as well as agricultural production also needs to be constantly monitored through the agricultural cycle when there is evidence of the increased risk of a major drought (Clay *et al.*, 2003). The countries of southern Africa need to develop better strategies to cope with the impacts of drought by themselves. South Africa should help with these methods as they cannot always aid other countries and increase their own vulnerability, especially if another major drought such as 1991/92 were to occur.

There are several elements that need to be applied in order to reduce the risk of drought and thus lessen the severity of the associated impacts. Assessments of the risk and preventing or reducing the risk of drought are important first steps that

require a state of constant preparedness (van Zyl, 2006). The next element is mitigating the severity or consequences of drought followed by emergency preparedness. The final two elements are effective response to drought and recovery and rehabilitation in the post-drought phase (van Zyl, 2006). The elements put forward in the National Disaster Risk Management Framework can work if used effectively and can reduce the severity of drought impacts.

The element of mitigating the severity or consequences of drought relies on assessing and addressing the impacts of drought. The development of a list of the highest priority impacts must be made and supported by scientific researchers, policy makers and the public (Knutson *et al.*, 1998). A vulnerability assessment will help in identifying the social, economic and environmental causes of drought impacts. The assessment links the impact assessment and policy formulation by directing policy attention to the underlying causes of vulnerability instead of the resulting impacts. A group of people with a good knowledge of the relevant topics is therefore very important in the process (Knutson *et al.*, 1998 and Wilhite *et al.*, 2000). Proactive measures in drought policy means anticipating the impacts of a drought before its onset. The influence of drought on agriculture and vulnerable communities can in this way be decreased.

6.3 Improving the Supply of Food and Reducing Vulnerability

Vulnerability changes over time incorporating social responses as well as varying and new disasters. Vulnerability can be brought down to lower levels with appropriate interventions and mitigation thus increasing the resilience of a society (Devereux, 2006). Should an event remain unmitigated or join with another such as the outbreak of disease, the crisis may escalate into a disaster (Washington and Downing, 1999). Improving food security amongst vulnerable communities is a very important social intervention that pre-empts the risk of a drought and leads to greater resilience during a drought.

The price of staple foods such as maize is an area that needs to be addressed to reduce vulnerability during drought and there are several ways of achieving this. The first entails investments to improve crop estimates and agricultural information (Food Pricing Monitoring Committee, 2003). Discrepancies in 2002 between the South African Grain Information Service and the Crop Estimates Committee led to the maize harvest being larger than estimated. Food prices only fell six months after the harvest, hurting the consumer. A substantial investment in the system of crop estimates is therefore required to avoid similar problems in future. The Department of Agriculture also needs to increase the budgetary allocation for agricultural information and statistics to improve production and price statistics (Food Pricing Monitoring Committee, 2003).

Another method of avoiding unnecessary volatility in commodity markets is to monitor the trade of grain. Only the big role players know what quantity of grain is being exported or imported or planned for movement. Inaccurate information can create instability in the commodity market and it is therefore important that information is more accurate and up-to-date (Food Pricing Monitoring Committee, 2003 and Lambrechts and Barry, 2003). The Government needs to introduce a statutory measure compelling all grain traders to report on a weekly basis on planned and actual imports and exports of grain. The South African Grain Information Service would manage the information. The Government also needs to ensure that government agencies such as Cross Border Road Transport Agency provide monthly information on cross border transport of grain (Food Pricing Monitoring Committee, 2003). The amount of grain available is very important information when a drought occurs and thus better monitoring of grain movement is required.

A successful food security strategy requires an efficient transport network in order to reach out to the poorest groups in society during a crisis. The poor efficiency of the rail network has led to a gradual movement towards road transport and an associated increase in price at all levels of the production chain (Food Pricing

Monitoring Committee, 2003 and Groenewald and Nieuwoudt, 2003). There is a need to recapitalize Spoornet and reopen rail sidings in rural areas to increase market participation by small-scale farmers in deprived communities. As noted in chapter 5 there are many in the public as well as agricultural arenas that feel that the infrastructure needs to be improved (*The Star*, 22 December 2003). Investment in rail transport will reduce the cost of transport and lead to beneficial consumer prices as well as economic development in rural areas (Food Pricing Monitoring Committee, 2003).

During drought the purchasing power of most rural people decreases because of the price of grains increasing. A reduction in earnings for the poorest households compounds the problem (Eldridge, 2002). The Government should investigate a poverty alleviation grant based on average annual income and grain prices to enable households' access to food. Small-scale agricultural production should be made a central strategy for production so that households receiving the grant can buy food from local farmers and also promote local economic growth (Food Pricing Monitoring Committee, 2003). The relief interventions should aim to limit the decreases in vulnerable communities' purchasing power and incomes that are generally associated with food crises during droughts (Eldridge, 2002).

In areas where markets are functioning reasonably well, interventions that address food demand issues during drought are seemingly more effective at protecting sustainable livelihoods than those that attend to food supply problems (Eldridge, 2002). Food demand interventions are categorized as either expenditure or income measures. Purchasing power and disposable cash are easier to increase by expenditure interventions than by income interventions (Eldridge, 2002). Expenditure has fewer logistical and local management requirements while income should be complemented by other interventions and should begin within a developmental framework before a drought occurs (Eldridge, 2002).

Demand issues should and can be addressed early in a crisis. An important advantage of this approach is the relative speed with which policies can be implemented (Eldridge, 2002). The purchasing power of the poorest households and their use of farm inputs during drought can be protected as the speed is greater than with relief programmes. Demand issues should be focused on in some way during food crises as purchases of staple food are likely to account for a large proportion of poor peoples' response (Eldridge, 2002). The aim is to increase the ability of vulnerable communities to look after themselves as opposed to relying on government relief during drought.

The Department of Agriculture should set up a unit to monitor agricultural prices throughout the production and distribution chain. The unit should also monitor land use patterns, land ownership, agricultural employment and land prices (Watkinson and Makgetla, 2002). The Government and the public would be alerted to actual and potential increases in consumer prices for staple foods and would thus also require the monitoring of the futures market. A further critical need is to define how the Government can support subsistence farmers that cannot afford to participate in current smallholder schemes (Watkinson and Makgetla, 2002). Food price increases have a devastating impact on the poor, and the Government has an obligation to protect its people and provide adequate access to food, especially when factors such as HIV/AIDS enhance the crisis.

Due to the slow onset and complex nature and causes, and the long-term nature of possible solutions, governments and donors tend not to respond to HIV/AIDS as an emergency (Lambrechts and Barry, 2003). Present prevention and treatment interventions will not ensure food security for HIV/AIDS affected households, especially in rural areas (Lambrechts and Barry, 2003). Disentangling the relative impact of the epidemic on food security would be extremely difficult, and therefore of greater importance is to realize that these issues are mutually reinforcing (Drimie, 2004).

The challenge for analysts and policy makers is to understand how the rural socio-economy is being affected by the disease. In this way, rural development policy can be modified to better achieve national agricultural sector objectives (Drimie, 2004). Another critical need is for role players in disaster management to develop an understanding of how the epidemic interacts with other factors (Drimie, 2004). The HIV/AIDS epidemic can then also be understood to reinforce the need for humanitarian systems to interact more effectively with long-term development assistance. These can be particularly focused on the role players involved in responses to food security (Drimie, 2004).

The role players that are responding to crises have a responsibility to understand the way that HIV/AIDS impacts on livelihoods and to address these issues in their response. Concerns relating to the epidemic need to be considered in all sectors and in all management programmes (Drimie, 2004). Households that are affected should receive support for long-term rehabilitation in the form of subsidies, training and affordable or free access to basic services and inputs. Agricultural production can thus be revived and food security improved (Lambrechts and Barry, 2003). Due to the long-wave nature of the epidemic, the full impact of the disease will not become evident for several years (Drimie, 2004). Proper understanding and policy changes are required not only for now, but for continued sustainable development as well.

6.4 Drought Forecasting and Monitoring

Climate forecasts are the prediction of various aspects of the climate of a region during a period of time in the future and aid in the reduction of vulnerability and food insecurity by means of anticipatory measures (Clay *et al.*, 2003 and O'Brien and Vogel, 2003). The predictions are usually concerning probabilities of anomalies of climate variables such as temperature and rainfall. Climate forecasts can include information on expected averages, the frequency of extremes or the occurrence of a seasonal event such as the onset of the rains (Clay *et al.*, 2003 and Reason *et al.*, 2005). Seasonal forecasts refer to the character of a specified season and seasonal

rainfall forecasts generally refer to expected rainfall anomalies. The anomalies include deviations from average conditions and information about specific events (Clay *et al.*, 2003).

Climatic information has a potentially useful role in reducing the considerable costs associated with climatic variability and can occur in three ways. The first is that seasonal climatic forecasting can improve decisions that anticipate the consequences of extreme events and so reduce the costs. The depletion of public stocks of grain is an example of a consequence that should be anticipated (Clay *et al.*, 2003). Second is that information should be made available as events in real time unfold. The management of responses could be improved by ensuring that farmers know what is happening to weather and growing conditions and government is assisted in responding to emergency situations (Wilhite *et al*., 2000 and Clay *et al.*, 2003). Thirdly, investment decisions for water-dependent systems should incorporate an assessment of the probabilities of climatic anomalies (Clay *et al.*, 2003).

The South African Weather Service uses two methods for helping to reduce the physical impacts of drought. Active research is being carried out on extended weather outlooks for periods of up to six months ahead (Vogel *et al.*, 2000 and Klopper and Bartman, 2003). Numerical modeling uses predictions about the evolution of the interaction between the surface and the atmosphere and is used for shorter periods. Statistical modeling uses historical data to predict the climate for longer periods (Clay *et al.*, 2003). Agricultural planning is most critical in August and bulletins are issued with increased regularity. The South African Weather Service is disseminating the information to a widening segment of the population instead of only to government and commercial enterprises (Monnik, 1998 and Vogel *et al.*, 2000).

The other method the South African Weather Service uses to reduce drought impacts is the provision of up-to-date reports and assessments of rainfall deficits

and regions affected by weather-related stress (Vogel *et al.*, 2000). A climate monitoring section is responsible for the implementation that keeps drought assessment and agricultural organizations, the media and the public constantly updated on the latest developments. Advances have also been made on the use of satellite data for the development of a real-time drought monitoring system. Historical imagery since 1985 will be used to develop severity threshold values for drought to determine prevailing conditions anywhere in South Africa. The data should allow for a more effective real-time assessment of drought in the country (Vogel *et al.*, 2000).

Limitations do still exist with regard to forecasting and early warnings. In South Africa one of the major limitations is the number of rainfall stations available (Vogel *et al.*, 2000). Rainfall figures obtained from the network of weather stations are used for the assessment of abnormal climatic conditions. The figures are compared with expected long-term figures and decisions are based on current figures and those received over the past three months (Vogel *et al.*, 2000). A problem with this system is that there are very few stations in some semiarid regions of the country and sometimes none in the formerly independent homelands (Vogel *et al.*, 2000). The erratic rainfall that is typical of South Africa is not adequately forecast and yet it is this information that is critical to crop performance in the country. Instead the focus remains on the prediction of widespread, abnormally low rainfall that is likely to be associated with a severe ENSO event (Clay *et al.*, 2003).

Predictions are also likely to be generalized as they work their way through the various dissemination channels (Washington and Downing, 1999). The warnings at a regional scale will end up being accepted as true for each locale within the region. Local conditions that are forecast may also be extended to adjacent geographical regions, even though they may experience very different conditions on average. Forecasts that are meant for specific time periods, such as the start of the rains, could be understood to be for the entire season and thus lead to disastrous problems

with crop farmers (Washington and Downing, 1999). Forecasting and climate predictions are a detailed science that requires the information to be interpreted as carefully as it was gathered. Generalizing predictions can lead to a food security crisis that could have been avoided with a bit more consideration.

Multi-year forecasts and seasonal forecasts have different benefits for commercial and subsistence farmers (Washington and Downing, 1999). Commercial farmers are able to use multi-year forecasts for capital and land investment decisions while the use for subsistence farmers is limited. Seasonal forecasts provide information on planting dates and crop selection for both farmers, but commercial farmers also use the information to decide how to use their land and water (Washington and Downing, 1999). A common factor amongst both farmers though is that they are more interested in knowing the distribution of rain throughout the season rather than the overall rainfall pattern for the entire season (Glantz *et al.*, 1997).

During an average dry season a farmer can double or treble their yield should a small amount of rainfall occur during the critical flowering stage of the maize crop (Glantz *et al.*, 1997). Within-season information can help commercial farmers increase certainty and reduce risk and aid subsistence farmers in improving food security and marketable surpluses. Agricultural extension services can also be improved for subsistence and smallholder producers as can the overall recovery from drought (Washington and Downing, 1999). The within-season forecasts are able to help with important decisions at various stages of the season. The onset of planting rains, the nature of early rains, the beginning, length and severity of a mid-season drought and the end of the rainy season all help with planting and harvesting assessments (Washington and Downing, 1999). The management of drought in South Africa requires detailed forecasts that are able to predict the distribution of rainfall during a season, so as to reduce much of the risk associated with farming, as shown in the meteorological effects of chapter 3.

Forecast information also needs to reach users in a timelier manner (Glantz *et al.*, 1997). Even though ENSO forecasts have improved and become more regular, most users of the information noted that they only received the forecasts two months after the fact. Several opportunities to act would have been lost and the impacts of the event may already have become visible. The impact information could only be used to assess the validity of the forecast (Glantz *et al.*, 1997). Many users also noted that they do not receive information at regular intervals, making it difficult to monitor the progress of the ENSO cycle. Better interpretation of ENSO data would also help the user to understand the implications of what has been observed and aid decision makers in using the information in their decision making process (Glantz *et al.*, 1997 and Dilley, 2003).

Forecasting must not be relied upon by itself to ensure early responses, strengthen sustainable livelihoods and empower vulnerable populations. There are still many social processes that give rise to hunger and food security issues and forecasts need to complement these processes instead of enabling them (Washington and Downing, 1999). Credit organizations can respond to early warnings of a poor season and reduce credit to small-scale farmers thereby causing lower yields. Prices of many basic commodities may rise due to the anticipation of shortages associated with climate forecasts. Improved climate forecasts require the political economy to better adapt to the widespread dissemination of these forecasts (Washington and Downing, 1999). The Government needs to ensure that these enhanced predictions are not used by large organizations to increase profitability at the expense of vulnerable communities.

Early warning and monitoring systems related to agriculture are essential for reducing vulnerability in the sector, especially to drought. The amount of support that is required to maintain a feasible production sector and the degree to which food security could be affected by drought are also evaluated (van Zyl, 2006). There are likely to be two overlapping monitoring systems concerned with food security and economic issues (Benson and Clay, 1998). The former would be more effective

if it integrated information on rainfall and the agricultural and food situation into economic monitoring. The monitoring of economic performance should similarly take increased notice of information on rainfall (Benson and Clay, 1998). As noted before, the variability in rainfall can act as the trigger mechanism for disaster and should therefore be included in all monitoring systems.

Monitoring systems should be designed to cover all areas of South Africa and provide accurate assessments of the current status of parameters such as food security (van Zyl, 2006). An appropriate network of all systems must be developed and monitored by the National Disaster Management Centre. The network can be maintained and various early warning and monitoring systems can also be assessed on their level of adequacy. The continuity in the operation and application of the systems can easily be maintained and updated (van Zyl, 2006). The need to improve early warning systems has occurred every time a drought has happened in South Africa. Nothing was done after each event except call for the improvement of drought forecasting. The management of drought in the country desperately requires government to develop an effective system of forecasting and monitoring of events in order to reduce their impact and associated vulnerability on agriculture and communities.

6.5 Government Strategies in Managing and Mitigating Droughts

The management of drought risk and the impacts of drought are mainly affected by the decisions made by government and need to include reducing vulnerability and food insecurity. Government addresses the issues of drought management from a multi-objective perspective (Knutson *et al.*, 1998). Every government agency that is involved has its own legislative mandates to oversee and implement. Some of these mandates may affect mitigation, preparedness, response or recovery related to drought. When emergency issues such as a drought arise, the multi-objective perspectives of government may work against each other. There could be a variety of incompatible but individually important objectives to consider. An effective

knowledge of various governmental institutions and their responsibilities is therefore essential for effective drought planning (Knutson *et al.*, 1998). Efficient interaction between government and non-governmental organizations and the understanding of both views is also important for policy formulation (Knutson *et al.*, 1998) as is continued coordination after a drought event.

A post-drought evaluation assesses the response of government, non-governmental organizations and others, and provides for a mechanism to implement recommendations for improving the system (Wilhite *et al*., 2000). As a result of institutional memory fading, post-drought evaluations help with the learning from past mistakes and successes. Evaluations should include an analysis of climatic and environmental aspects of the drought as well as economic and social consequences (Wilhite *et al*., 2000). The degree to which pre-drought planning proved useful in mitigating impacts, facilitating relief and in post drought recovery should also be assessed. Where societies showed resilience and drought coping mechanisms worked as well as failed should also be evaluated (Wilhite *et al*., 2000) as these add much needed improvements to existing strategies.

Strategies to mitigate the impacts of drought in the long term and effective responses need to consider economic structure, resource endowment and the current economic situation (Benson and Clay, 1998). A society that is drought-resilient will also be hunger-resilient as the same social and physical determinants are associated with food security and drought resilience (UNDP-BCPR, 2005). Major relief agencies have recognized that hunger is a function of people's abilities to cope with drought events. Due to the fact that food security and drought resilience result from a complex set of interacting physical and social traits, a good knowledge of these interactions is needed for food security policy (UNDP-BCPR, 2005). The economic level of a country can determine the impacts of a drought but the ability to understand and manage drought risk can lead to the dampening of these impacts with effective programmes.

A well developed disaster management programme can be found with the Total Disaster Risk Management Approach (TDRM) in the Philippines (van Zyl, 2006). The Approach makes use of existing knowledge and techniques on disaster reduction and response and risk management. The ability to achieve sustainable development objectives is of major importance to disaster risk management for government as is effective communication of knowledge at all levels. The disaster management cycle has various concerns throughout the different stages and the TDRM Approach aims at addressing these problems comprehensively and efficiently (van Zyl, 2006).

The Approach utilizes a proactive method to dealing with disaster events as it considers a larger range of issues associated with disaster risk and management (van Zyl, 2006). The conditions of disaster risks stimulated by unsustainable development are focused on and in this way the underlying causes of disasters are attended to. The community as well as concerned sectors are also able to partake in the reduction of vulnerability. By using reliable disaster risk information, the ability to make good decisions in disaster reduction and response is ensured. The prevention of disasters as well as the preparation for disasters can also be effectively improved (van Zyl, 2006).

The Approach also aims at achieving improved disaster reduction and response through multilevel, multidimensional and multidisciplinary co-operation and collaboration of stakeholders' action (van Zyl, 2006). Broad-based participation in policy and programme development is encouraged in other development concerns such as land use and food security. The participation of affected communities is ensured and the best way to use limited resources is also considered. Through good communication and efficient exchange of reliable information, the public are also able to reduce disaster risk and improve disaster management (van Zyl, 2006). These are all aspects that were missing from previous attempts at managing drought in South Africa.

Accurate and reliable information related to hazards, vulnerability and disaster risk is an integral part of the disaster management cycle (van Zyl, 2006). The mapping of disasters and vulnerability assessments are vital to the Approach as they provide for good decision-making and efficient sharing of disaster risk information. The Approach also ensures that the appropriate enabling mechanisms for disaster risk management are in place, including policy, structure, capacity building and resources (van Zyl, 2006). The TDRM Approach is a complete system for the management of disasters in the Philippines. The relevant issues are all covered from the underlying causes to the preparation and prevention phases. Disaster management is a process that requires the participation of everyone concerned as well as the desire to implement it. Lessons can be learned from the Approach when implementing the National Disaster Risk Management Framework.

As discussed in chapter 4, a Drought Management Plan has recently been drafted in South Africa and is currently still open for discussion. The main aim of the Plan is to minimize the impacts of drought by developing an effective, integrated risk and disaster management system for plant and animal husbandry and price and income systems (National Department of Agriculture, 2005 and van Zyl, 2006). There are several factors that need to be incorporated in reducing drought risk and managing drought. The first involves setting up a system of information management so that drought situations can be monitored and social vulnerabilities can be detected and countered (van Zyl, 2006).

Drought indicator maps need to be compiled to provide information on the state of the drought. Vegetation indicator maps also need to be continuously compiled to allow farmers to make pro-active decisions regarding their current strategy (van Zyl, 2006). Early warning systems need to be improved and implemented to advance the preparation for droughts. Priority programmes need to be established for risk reduction, including preparedness, mitigation, response, recovery and rehabilitation (van Zyl, 2006). A drought mitigation plan requires the development and dissemination of information for everyone from decision makers to vulnerable

individuals. The drought affected should also be informed of actions to take as well as of assistance they may and cannot expect (van Zyl, 2006). All of this will prove vital for the planning of individuals for drought in the future. The inputs from Organized agriculture in refining the Drought Management Plan are of utmost importance (National Department of Agriculture, 2005 and van Zyl, 2006).

Further additions that can be complementary to a drought management scheme include the financial situation of farmers. Due to systemic risk in the South African summer rainfall region, an area insurance programme aimed mainly at small-scale farmers may be more appropriate (Groenewald and Nieuwoudt, 2003). Farmers would be insured as a group and thus problems associated with individual crop insurance such as adverse selection and the verification of claims could be overcome. An Income Equalisation Deposit (IED) scheme can also be considered (Groenewald and Nieuwoudt, 2003). Farmers would invest in a bank in good years and pay tax on the income only when it is withdrawn. Misuse of the scheme can be avoided by imposing a rule that no funds can be deposited if current taxable income is below a farm's five-year moving average taxable income. A similar programme is strongly supported in Australia and requires no state contribution (Groenewald and Nieuwoudt, 2003), and this would prove useful in South Africa as valuable resources could be allocated elsewhere.

National Commodity Organisations (NCO's) should also develop their own disaster risk management strategies. One suggestion is that they use the National Disaster Risk Management Framework as a basis, and more specifically, the Key Performance Areas and Enablers (van Zyl, 2006). Key Performance Area 1 would relate to capacity building and liaison with stakeholders. Government, Organised Agriculture and farming communities would all be involved. The NCO's would also communicate with other stakeholders such as the Department of Water and Forestry at different levels (van Zyl, 2006).

Key Performance Area 2 would be risk assessment. The assessments should follow the scientific principles set up by the National Disaster Management Centre. Risk profiles compiled by NCO's should be able to be integrated into other NCO's profiles (van Zyl, 2006). Key Performance Area 3 would be risk reduction. The main aim would be to reduce the risk and prevent a hazard becoming a disaster. The dissemination of information and measures to respond and manage a hazard are of great importance. NCO's should also compile inventories on their capacity to deal with vulnerability and risks (van Zyl, 2006). Key Performance Area 4 would relate to post disaster recovery and rehabilitation. NCO's would participate in fully restoring communities as well as post disaster development programmes (van Zyl, 2006).

Enabler 1 remains as information management and communication. NCO's would participate in information management and communication systems of government departments at all levels (van Zyl, 2006). Enabler 2 is education, training and information programmes. These would be aimed at farming communities and would also create awareness on prevention, preparedness and response (van Zyl, 2006). Enabler 3 would be the inputs by NCO's on funding requirements to Government, Organised Agriculture and farming communities (van Zyl, 2006). The participation of NCO's in the management and mitigation of drought in South Africa would be of great benefit to everyone concerned. NCO's may also create their own programmes that better suite them, but the main priority is that they are involved and aligned with the major role players. They should also be involved in post-drought evaluations with government and other organizations.

There are also several other recommendations for government that can be useful for drought risk management in the agricultural sector. Drought-relief agencies should co-ordinate their attempts to create a general pool of knowledge and experience on drought relief. Relief should also be readily available during severe drought conditions (Wilhite *et al*., 2000 and van Zyl, 2006). In order to manage risk more effectively, those at risk should know what to expect from government during a

drought (van Zyl, 2006). Capacities to withstand losses associated with drought such as incomes and assets and the effect of government programmes also need to be evaluated (Knutson *et al.*, 1998).

Permanent structures to ensure continuity in the process of vulnerability reduction need to be created (van Zyl, 2006). Education, extension and research schemes can reduce the vulnerability of rural communities to drought. Improving household security and promoting self-reliance can also reduce the vulnerability of developing communities (van Zyl, 2006). Evaluating the use of marginal farmlands can reduce resource and environmental degradation and thus also vulnerability to drought. Workshops on various drought topics such as crop survival during drought would also increase drought resilience (Knutson *et al.*, 1998). The reduction of vulnerability in all the states in the sub-continent is also of vital importance. Communication and co-ordination must be established and relief actions should be planned in order to ease the burden on South Africa (Chandrasekhar, 2002 and van Zyl, 2006).

Water provision systems in rural areas need to be addressed as does the efficiency in water use (van Zyl, 2006). The management of water demand as well as supply also needs to be promoted. A demand-based approach would result in more sustainable responses to water shortages being developed such as water recycling in urban areas and enhanced irrigation practices (van Zyl, 2006). Farms can also reduce water consumption by using sprinkler and drip irrigation systems with a return-flow system. Legislation is required for water agencies to develop contingency plans. The utilization of drought or salinity tolerant crops will always be promoted during drought, but incentives to use them also need to be supported (Knutson *et al.*, 1998).

As seen in chapter 5 the media has an important role to play in the management of drought and should be included in all forms of drought planning (Knutson *et al.*, 1998 and Wilhite *et al*., 2000). Media personnel with an extensive knowledge on

the subject should be incorporated into the drought planning process. Reports also need to be written for the media early in the development of a drought (Knutson *et al*., 1998 and Wilhite *et al*., 2000). The media must be updated about the conditions of the drought and those affected by it as well as of any plans to manage the drought. The most important factor is to maintain communication between the public, policy makers, scientists and the media (Knutson *et al.*, 1998; Baethgen, 2000 and Klopper and Bartman, 2003). The improvement of public awareness and information can result in the reduction of vulnerability and better management practices.

6.6 Summary

Chapter 3 has shown that the understanding of the impacts of droughts as well as the underlying causes occurring prior to a drought event are crucial for managing droughts more effectively in South Africa. Assessments and comprehension of the impacts can be used in future drought situations to reduce the vulnerability of previously affected communities (Vogel *et al*., 2000 and Wilhite and Vanyarkho, 2000). Food security is a critical method of reducing vulnerability and the ability to look after oneself is of great importance in mitigating the effects of drought. The reduction of vulnerability and the continuation of development will dramatically increase the resilience of all farmers to drought (Washington and Downing, 1999).

Chapter 4 has also shown that several advances need to be made for drought policies to be more effective, and these methods and techniques were discussed in this chapter. The improvement of early warning systems and the ability to accurately predict drought events will enhance the robustness of farmers in the country (Benson and Clay, 1998 and Dilley, 2003). There is a drastic need to improve the prediction of rainfall within a season and to make the information available at a much quicker rate. Farmers require information that is reliable in order to develop more independent and consistent food security systems (Glantz *et al*., 1997 and Tadross *et al*., 2005). Advancements in forecasting will reduce

drought impacts as well as the associated vulnerability. Monitoring systems are therefore also essential as they complement the work done by forecasts by screening other related sectors of the economy (Clay *et al*., 2003).

The Government has the most important role to play in managing drought. Post-drought evaluations are of utmost importance for learning for future events. The lessons learnt from these assessments can quicken the implementation of effective policy (Wilhite *et al*., 2000). Integrating Organised Agriculture as well as National Commodity Organisations will greatly improve management schemes and reduce the time taken to implement them (van Zyl, 2006). Lessons can be learnt from the Total Disaster Risk Management Approach in the Philippines and added to the National Disaster Risk Management Framework for a more successful application (van Zyl, 2006).

The most important application for government is the use of acquired information. Trained and educated individuals and organizations need to use the information effectively in all aspects of drought preparation, and the media also needs to participate more with all concerned parties (Knutson *et al*., 1998 and Wilhite *et al*., 2000). Chapter 5 has also shown that the public needs to be included in the management process. The management and mitigation of drought in South Africa is an issue that should involve everyone at all levels and needs to apply lessons learnt from past attempts. Chapter 7 will summarize the main findings of the report and show the lessons government has learnt and lost and how these can improve drought management if applied effectively.

CHAPTER 7

SUMMARY AND CONCLUSIONS

7.1 Introduction

Drought is an endemic feature of the South African climate (Vogel, 1995) and its impacts have thus far been severe, especially with regards to the more vulnerable communities as well as the agricultural sector. Rainfall variability is the main cause of drought in South Africa (Mason and Tyson, 2000 and Tyson and Preston-Whyte, 2000). The El Niño Southern Oscillation accounts for thirty percent of the variability in rainfall (Tyson and Preston-Whyte, 2000). Intra-seasonal rainfall is the primary concern of maize producers as it is this form of variability that either aids or hinders the growing of a season's crop (Reason *et al*., 2005). Maize is highly sensitive to climatic variation and the occurrence of droughts has made the production of staple foods more difficult for vulnerable communities (Clay *et al*., 2003), thereby requiring government intervention.

This study has aimed to answer three pertinent questions, namely, what were the major societal and agricultural impacts of recent droughts in South Africa? How has the South African Government dealt with these drought episodes? And what were the major lessons learnt and /or lost by the various role players involved in drought risk reduction and drought management? By focusing on one sector, i.e. the agricultural sector, the answers to these three questions will add to the existing body

of literature by providing a platform for further research and investigation into how drought risk management and drought mitigation can be improved upon. With regards to the first question, several interesting points emerged and these will now be discussed.

7.2 Significant Societal and Agricultural Impacts of Drought

The vulnerability of communities and the agricultural sector of South Africa are usually exposed by the progression of a drought. In this section the most important effects of recent droughts in South Africa will be reiterated. These include the detrimental effects on food security, the increase in the prices of staple foods and factors aggravating the impacts of drought. The understanding of these impacts, as well as the interactions between these effects, is vital for improving the management of droughts in South Africa.

7.2.1 Food Security and Macro-drivers of Change

As discussed in chapter 3, food security is one of the most important impacts associated with drought. The need for food is exacerbated by the onset of a drought because the ability to grow maize is usually diminished (Tadross *et al*., 2005 and UNDP-BCPR, 2005). Small-scale farmers are the most severely affected as they have fewer resources to draw upon during drought and often require support from government (Chabane, 2002). Imports are often a necessity because firstly there are no reserve stocks and secondly the Government also needs to provide food aid to the rest of southern Africa thereby reducing local produce (Chandrasekhar, 2002 and Lambrechts and Barry, 2003). The exporting of food to other countries negatively affects the local population with regard to food security, health and nutrition (Chabane, 2002).

7.2.2 Effects of Drought on Food Prices

During a drought not only does food become scarcer but food prices also tend to escalate. Decreased amounts of food act to drive the price of food up. The spin offs into the system also includes the role that the availability of food in the system plays in determining agricultural management decisions. Farmers are likely to use the market price of maize in order to determine the amount of maize that they plant (Watkinson and Makgetla, 2002). At the time of harvest, a low maize price could result in many farmers holding on to their stocks until the price improves. During a drought a similar trend is exhibited as farmers will keep reserve stock until the international aid agencies intervene and are able to pay higher prices (Chabane, 2003; Food Pricing Monitoring Committee, 2003 and Drimie, 2004). The effect is to reduce local maize availability thereby increasing food prices and food insecurity.

7.2.3 Factors Enhancing Risk to Drought

Certain factors such as vulnerability and HIV/AIDS act to aggravate drought and the overall livelihoods of communities in South Africa. Poor social and economic conditions tend to enhance the effects on a region affected by drought. The more vulnerable a community is, the more they will be affected by the impacts of a drought (Cutter, 1996 and Drimie, 2004). Vulnerable households are repeatedly exposed to droughts and this erodes their ability to cope and pushes them towards chronic food insecurity (Devereux, 2006). Resilient households can improve their ability to manage drought by adopting effective adaptive strategies or external interventions. The intention of all management and mitigation strategies, as well as emergency interventions, should therefore be to shift households from increasing vulnerability to increasing resilience over time, but this requires effective risk reduction strategies (Devereux, 2006).

The HIV/AIDS epidemic is another example of a pre-existing condition that exacerbates the effects of a drought. The ability to cope during a drought is closely related to the strongest members of a household being able to work (Clover, 2003 and Drimie, 2004). The disease leaves many households without their most productive members and the important farming knowledge that they posses. The result is that many households are headed by women or children who may lack the necessary farming knowledge, which makes adaptation to drought extremely difficult (Annan, 2003 and Lambrechts and Barry, 2003). Drought and the HIV/AIDS epidemic may be independent phenomena, but their relation to food insecurity allows them to mutually reinforce each other (Clover, 2003 and Drimie, 2004). The significant impacts of drought in South Africa have forced government to intervene, resulting in several lessons being learnt and lost around drought management and mitigation.

7.3 Lessons Learnt and Lost resulting from Government Interventions

Questions two and three of the aims of this study are closely related and in order to avoid repetition, will be discussed together. The severity of the 1991/92 drought in South Africa resulted in the Government becoming more proactively involved in drought risk reduction and drought management. As a result, many lessons have been learnt that have added value to drought management efforts, but many lessons have also been lost or missed that could have eased the suffering experienced during subsequent droughts in South Africa. Major lessons that have been learnt include changes in drought management policy, the value of seasonal climate forecasts, deregulation of agricultural markets and solutions to curb the amount of food exports. Lessons that have been lost such as the drawbacks of deregulation, the need to improve early warning systems as well as the state of the South African infrastructure and the HIV/AIDS epidemic's effects on food security will also be examined.

7.3.1 Gradual Shifts in Drought Management Policy

Most of the early responses to drought by the South African Government only came about as a result of a need for relief and included subsidies and food and water relief (Vogel, 1998). The assistance schemes used by the Government usually led to widespread dependency on the state by farmers. These policies were also disproportionately awarded and tended to favour white commercial farmers. Only after the severe drought of 1991/92 did some proactive changes in drought risk reduction start occurring (Vogel *et al*., 2000). Drought agencies began to form and farmers were encouraged to be more self reliant and to prepare for future droughts (Vogel *et al*., 2000).

Early policies for coping with and managing drought also had several important aspects missing from them. Early warning systems needed to be improved (Vogel, 1998) and there was a lack of ability to assist rural farm workers and an absence of community structures to interact with relief agencies that hindered the progress of an effective drought management strategy (National Drought Management Strategy, 1993). Drought relief schemes also made heavy demands on State funds as well as the tax payer (Bruwer, 1989).

By 1997 the lesson had been learnt that national disaster management needed to be approached from a prevention and mitigation perspective as the Green Paper on Disaster Management was initiated (Vogel *et al*., 2000). The Disaster Management Act of 2002 saw many improvements being made with regard to a drought management policy in South Africa, but there were still many gaps that needed to be filled. The National Disaster Risk Management Framework of 2005 finally brought about a comprehensive overhaul of drought policy for South Africa. The policy and future drought plans such as the Drought Management Plan are beginning to address some of the gaps in the field. The outlook with regard to future droughts has improved as the risk of disasters is better assessed and reduced and

farming communities are also being prioritized for reducing vulnerability (van Zyl, 2006).

7.3.2 The Value of Comprehensive Climate Forecasts

Climate information has played a key role in drought risk reduction, but improvements can be made. The majority of decision makers were being made aware of the El Niño Southern Oscillation by the mid-1990s by scientific reports, but there was a serious lack of understanding of the event (Glantz *et al*., 1997 and Dilley, 2003). Evidence was not seen as credible and early forecasts were disregarded (Glantz *et al*., 1997). Climate modeling had not improved significantly by 1997 but the impact of ENSO was better understood and forecast drought events were now being related to the event (Clay *et al*., 2003). The problem was that farmers relied too much on the information and based their plantings on it. When the ENSO related forecasts were proven wrong, many farmers could not alter their strategies for the season (Clay *et al*., 2003). Sole reliance on ENSO information has proven costly and the lesson to assess all climate information such as intra-seasonal forecasts and within season rainfall variability has slowly been learnt.

7.3.3 The Benefits of Deregulation

The process of deregulation began in 1996 in order to decrease government expenditure, make markets more efficient, improve resource allocation and to decentralize decision making (Groenewald, 1991). Deregulation has seen many positives occurring in the South African markets. Production efficiency has increased and a less capital intensive agricultural sector has resulted in increased profits. Foreign trade of agricultural commodities has also improved (Chabane, 2002). Commercial farmers have adapted well with their marketing strategies and small-scale farmers could benefit by earning foreign exchange (Ortmann and Machethe, 2003). The financial gains brought about by the deregulation of markets have been good for South African agriculture.

7.3.4 The Effects of Drought on Small-Scale Farmers

Small-scale farmers have had to struggle with drought and other agricultural factors for many years, mostly without the help of the Government. The process of deregulation has exposed many farmers to international competition and many have converted cropland to grazing to avoid the added risk of drought (Groenewald and Nieuwoudt, 2003). Numerous small-scale farmers have been unable to adjust to policy and market changes and have had to leave the agricultural sector altogether (Chabane, 2003). The maize industry is becoming more concentrated in the hands of large commercial farmers as small-scale farmers are succumbing to their vulnerability to drought and are losing their livelihoods as well as their own best source of food (Watkinson and Makgetla, 2002). The Government is, however, looking at providing support for small-scale farmers in the form of assistance schemes until they are better able to cope (van Zyl, 2006).

7.3.5 Exports and Resulting Food Insecurity

Zimbabwe, Malawi and Mozambique have well documented social problems in their own countries that warrant serious attention. These problems have led to the inability by the respective governments to provide aid to the populations of their countries during times of drought (Chandrasekhar, 2002). As a result, the South African Government has felt obliged to help these countries by providing food aid during drought. The result has been a decrease in the amount of maize available locally and a subsequent increase in food insecurity (Chabane, 2002). The Government has, however, put forward a proposal whereby these countries will be assisted in repairing their own agricultural sectors so that their reliance on South Africa during drought would be minimized (van Zyl, 2006).

7.3.6 Emergency Reserve Funds

During recent drought events in South Africa, large-scale exports have occurred to other southern African countries. When these exports have exceeded the amount of maize that is available domestically, imports have been required at a substantial cost (Chabane, 2002). The need to improve the situation in other southern African countries has been discussed, but the way to ease local food security concerns is a lesson that has been learnt the hard way. The cost of keeping reserve stocks has been shown to be too much, and most of the time farmers keep their own stocks in order to drive the price up (Food Pricing Monitoring Committee, 2003). Steps have recently been taken to keep reserve funds that can only be used to alleviate food concerns during future droughts (Drimie, 2004).

7.3.7 Drought Information and Public Participation

The dissemination of information to the public has been an important lesson that has been learnt. Keeping the public well informed of drought events that may occur as well as of policies that have been implemented is an effective method of dealing with concerns (Knutson *et al*., 1998 and Wilhite *et al*., 2000). Including farmers and the public in decision making is also a top priority that is being implemented with every process of drought strategy (van Zyl, 2006). The public as well as farmers are generally unhappy with current initiatives (*The Citizen*, 13 February 2004). By incorporating valuable information and experience into various plans, as well as by making effective use of the media to distribute information, the affected groups may better understand the purpose of different policies and approaches. Drought management is more effective when the people that the strategies target are included. As discussed in chapter 6, this can be achieved through education, extension and research schemes aimed at the public as well as by improved communication between the public, policy makers, scientists and the media. The major lessons that have been lost will now be discussed.

7.3.8 Time Taken to Construct and Implement Policies

The first real attempts at dealing effectively with drought in South Africa began during and after the 1991/92 drought. A more proactive stance towards drought events began at this time (Vogel *et al*., 2000). Responses to the drought were only initiated when the rains had failed and crop damage was evident, as decision makers were waiting for hard evidence that food shortages would occur (Glantz *et al*., 1997). Lessons were learnt from these errors in judgment, but an important lesson was also lost. The time taken to construct and implement policies is vast and then the resulting policies are not good enough to deal with impending hazards. The 1997/98 drought was not as bad as the 1991/92 drought (Dilley, 2003), and that was the main reason why the Government was spared further humiliation. Five years after the 1991/92 drought, which was one of the worst droughts on record, there was still no effective drought policy in place (South African Press Association, 1999). By 2003/04, it still appeared that nothing had yet been done about disaster management in South Africa despite the Disaster Management Act of 2002. Thirteen years after the major drought of 1991/92 the National Disaster Risk Management Framework was implemented (National Department of Agriculture, 2006 and van Zyl, 2006) and the first effective disaster management policy was eventually applied.

7.3.9 Improving Early Warning Systems

One of the biggest concerns with regard to recent drought events in South Africa has been the lack of an effective early warning system. Since the 1991/92 drought there have been calls to improve the ability to forecast droughts with greater accuracy and reliability (Clay *et al*., 2003). The same occurs after every subsequent drought in the country as no significant improvements are made. Most of the droughts late in the 1990s and early in the 2000s may have been substantially reduced in impact had the lesson to improve early warning systems been learnt. The move from government to improve forecasting only came in 2005 with the National

Disaster Risk Management Framework proposing significant changes (van Zyl, 2006).

7.3.10 Drawbacks of Deregulation

Deregulation of agricultural markets brought many positives to the economy of South Africa. There were, however, several negatives brought about as a result of a missed lesson. Small-scale farmers are not able to benefit from improved producer prices as few are surplus producers, and then these prices are not always favourable (Sayagues, 1997). Pressure brought about from international competition has also resulted in many farmers converting to stock farming or leaving the industry altogether (Chabane, 2003). One of the main objectives of government is to encourage the growth of black commercial farmers (Chabane, 2003). The withdrawal of many farmers from the agricultural sector due to a lack of government support is hindering this objective. Only recently has the Government improved support structures for emerging farmers (van Zyl, 2006).

7.3.11 The State of South Africa's Infrastructure

The transport of food from producers to consumers as well as of food aid is an important aspect of food security. Notice has been taken of the poor state of the South African infrastructure, especially during a crisis where rapid distribution of food aid is essential (Food Pricing Monitoring Committee, 2003). The public have also been alerted to this fact as a result of the coverage of drought events in the media (*The Star*, 22 December 2003). The lesson to improve the state of the transport system in the country has not been learnt through several droughts. Only with the advent of the National Disaster Risk Management Framework has there been a proposal to improve the infrastructure to better manage disasters (van Zyl, 2006).

7.3.12 The HIV/AIDS Epidemic and Food Security

The HIV/AIDS epidemic is a serious problem that the Government has been dealing with for many years. The Government has been managing the epidemic as an isolated emergency that requires independent attention (Drimie, 2004). The lesson that the Government needs to learn is that the epidemic affects and is related to all sectors of the economy. The agricultural sector is one of the most severely affected as food insecurity is increased, especially during drought (Clover, 2003 and Lambrechts and Barry, 2003). Food security and HIV/AIDS are strongly correlated and the Government should adopt strategies that include both. Treating these factors as separate drought related entities will not improve any drought management policies and may actually enhance the problem (Drimie, 2004).

7.4 Drought in the Future

Vulnerability is one of the most important aspects surrounding the occurrence of drought. Vulnerability, including social and physical vulnerability, is a pre-existing condition that enhances the impacts of a drought and as a result needs to be reduced (Washington and Downing, 1999). Reducing the vulnerability of households and communities will lead to greater resilience during drought and therefore lessen the costs involved (Devereux, 2006). Improving the resilience of people will decrease the effects of drought on the entire country and therefore the practice of drought risk reduction is of great importance. The improvement of early warning systems as well as the infrastructure of the country will be good for drought management and mitigation. Coupled with reduced vulnerability, these two factors can lead to drought becoming a small-scale event of little concern to current vulnerable communities.

The National Disaster Risk Management Framework has brought about an effective policy for drought management in South Africa after several failed attempts. The Framework incorporates almost all aspects of drought management, mitigation and

emergency preparedness that were missing before (van Zyl, 2006). The policies can also be supplemented by other existing and successful policies from other regions such as the Philippines' Total Disaster Risk Management Approach (van Zyl, 2006) discussed in chapter 6. Including National Commodity Organisations can also help to make drought management easier to realize (van Zyl, 2006). The Framework can become a successful policy as long as all aspects are adhered to and implemented effectively by everyone concerned.

Climate change is currently the most important environmental concern around the world. Drought is the top priority related to climate change for South Africa. In order to be able to adapt to changing conditions, the Government and the people must work together to prepare for the future (Waller-Hunter, 2004). Government policies have improved substantially since the early 1990s and the education of communities has helped to inform people about impending disasters. Climate change is a very real threat and the effective implementation of policies is required along with increased resilience. South Africa could look forward to a bright future with regard to drought management, mitigation, risk reduction and adaptation to climate change as long as time is used efficiently.

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