STOCK FODDER DROUGHT RELIEF SCHEME: A CASE OF THE DEPARTMENT OF AGRICULTURE IN POLOKWANE MUNICIPALITY

By

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ABSTRACT

The objectives of this study were to assess whether the livestock fodder drought relief scheme was implemented according to the predetermined criteria, and to recommend action to be taken for the improvement of the scheme. The study focused on communal farmers who bought fodder from three departmental depots under Polokwane Municipality Department of Agriculture as an organ of the state. The cluster sampling was drawn from the database of livestock farmers who applied for a fodder drought relief scheme in four service centres of Polokwane Municipality.

Polokwane Municipality Clusters were Maja/Chuene; Molepo, Mojapelo, Mothapo; Mothiba, Makotopong, Mamabolo, Dikagle and Moletjie/Maraba. The agricultural extension technicians, animal health officers and natural resource management technicians who implemented the drought relief scheme were interviewed regarding the implementation process.

The advisory forums consisting of all stakeholders and technical advisory team participating at the district municipality, local municipality and service centres of the department of agriculture dealing with disaster risk management had not been established. There were no formal structures dealing with disaster risk management at the district, municipality and service centres.

Capacity building on drought risk assessment, drought risk reduction, drought response and recovery, information and communication and funding arrangements were done by national and provincial disaster management staff. These individuals were assigned the responsibility of disaster risk management planning and operations.

The Disaster Management Act should be successfully implemented at Polokwane Municipality Department of Agriculture as part of the organ of the State. Both farmers and responsible officials in disaster management should be trained and empowered. Disaster prevention strategies should be working, the implementation of drought relief scheme should be efficient and cost effective to the government and the beneficiaries. Polokwane residents should be able to recognize the benefits of disaster management in their lives.

DECLARATION

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

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Signature

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Date signed

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To be wise you must first have reverence for the LORD. If you know the Holy One, you have understanding.

[Proverbs 9:10]

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LIST OF ACRONYMS

ADMP	National Drought Management Plan
ADRM	Agricultural Disaster Risk Management
ARAP	Accelerated Rain fed Arable Programme
CARA	Conservation of Agricultural Resource Act
CRF	Calamity Relief Funds
CRP	Conservation Reserve Program
CS/CSS	Central Schemes /Central Sponsored Schemes
DERA	Drought Emergency and Recovery Assistance plan
DFID	Department for International Development
DMIC	Drought Monitoring and Information Centre
DRM	Disaster Risk Management
DRP	Drought Relief Program
DoA	Department of Agriculture
EC	Exceptional circumstances
ECOWAS	Economic Community Of West African States
EFC	Eleventh Finance Commission
ENSO	El Nino Southern Oscillation
EWC	Early Warning Committee
EWS	Early Warning System
FAO	Food and Agriculture Organization
GTZ	Deutche Gesellschaft fur Techursche Zusammernarbeit / German Technical Cooperation)
IFAD	International Fund for Agricultural Development
ISDR	International Strategy for Disaster Reduction
NCCF	National Calamity Contingency Fund
MENA	Middle East and Northern Africa
NEPAD	New Partnership for African Development Communities
NFCR	National Funds for Calamity Relief
NDAF	National Disaster Advisory Forum
NDMC	National Disaster Management Centre
NRM	Natural Resource Management
OCHA	Office for the Coordination of Humanitarian Affairs.

OXFAM	Oxford Committee for Finance Relief
PDSI	Palmer Drought Severity Index
PTO	Permission to Occupy certificate
SWOT	Strength, Weakness, Opportunities and Thread analysis
SADC	Southern Africa Developing Communities
SPI	Standardised Precipitation Index
SADC	Southern African Developing Communities
UN/ISDR	United Nations of the secretariat of the International Strategy of Disaster Reduction
UNIAID	United States for International Development
UNDP	United Nations Development Programme
VITSAT	Vit University Satellite Technology
WMO	World Meteorological Organisation

DEFINITION OF TERMS

The following terms were defined in relation to the implementation of National Department of Agriculture drought relief scheme of livestock fodder. The following terms were defined for the purpose of implementing the fodder drought relief scheme:

Drought: a prolonged, abnormal dry period when there is insufficient water for the usersô normal needs. Agriculture suffers and eventually everyone feels the impact. Agricultural drought may be seasonal, periodic and disaster drought. Seasonal drought is predictable and can be an annual event. Periodic drought is when it rains at more or less regular intervals and below the expected average annual rainfall. Disaster drought is defined as damages caused by the deficiency of precipitation/rainfall over an extended period of time (National Department of Agriculture, Disaster Risk Management Unit, 2009).

Disaster: a progressive or sudden, widespread or localized natural or people-induced occurrence that causes or threatens to cause damage to property, infrastructure or the environment, and is of the magnitude that exceeds the ability of those affected to cope with its effects using only their resources (National Department of Agriculture, Disaster Risk Management Unit, 2009).

Livestock: cattle, sheep and goats (National Department of Agriculture, Disaster Risk Management Unit, 2009).

LSU: a unit which consists of the prescribed number of animals of a prescribed kind, type, breed, age or sex, or which is in a prescribed phase of production or is of a prescribed approximate live mass (National Department of Agriculture, Disaster Risk Management Unit, 2009).

Communal farmer: an independent household that own and farms with livestock on the same property or common grazing area. This farmer is typically farming on State land, municipal or traditional allocated permission to occupy certificate (PTO) land and owns less than or equal to 30 LSU (National Department of Agriculture, Disaster Risk Management Unit, 2009).

Small-scale farmers: farmers who own more than 30 LSU and less than or equal to 50 LSU (National Department of Agriculture, Disaster Risk Management Unit, 2009).

Commercial large farmer: an independent household or legal entity that primarily owns and farms with livestock on property leased for at least five years or owned by that household or entity and qualifies to be registered with SARS. Commercial farmers own more than 50 LSU (National Department of Agriculture, Disaster Risk Management Unit, 2009).

Scheme: the livestock fodder drought relief scheme (National Department of Agriculture, Disaster Risk Management Unit, 2009).

Model I: farmers having no draught animals and having 7 ha on average for planting dry land crops.

Model II: farmers having 1 -20 cattle used as draught animals and having 9 ha on average for planting dry land crops.

Model III: farmers having 21- 40 cattle used as draught animals - and having 10 ha on average for planting dry land crops.

Evading mechanism: the movement of both people and their livestock during drought to better resourced places (OôFarrell, Anderson, Milton & Dean, 2009).

CHAPTER 1

INTRODUCTION AND METHODOLOGY

1.1 Introduction

The Limpopo province is a drought-prone area and it experiences drought every three years. The national department of agriculture assisted livestock farmers with fodder during drought disasters by approving relief schemes. The implementation of drought fodder relief schemes raised more questions than answers by communal farmers. Farmers did not receive the fodder they expected from the drought relief scheme. There were many challenges related to the implementation of the scheme. Some of them were the registration of target beneficiaries, the distance to the sales points and depots and information dissemination of the whole fodder drought relief scheme in Polokwane.

The 2008 implementation scheme of the National Department of Agriculture Drought Relief Scheme in Polokwane Municipality started with the registration period until the final stage where fodder ended in the hands of the farmers. The study focused on the identification of the problem areas and came up with the strategies to improve the implementation of drought fodder relief scheme in the communal farming sector in Polokwane Municipality.

In this chapter the background of the study will be discussed. The description of the study area, the schematic representation of Polokwane Municipality of fodder scheme, problem description, objective of the study, research question, delineation, ethical consideration and research methodology will also be discussed. The research methodology comprises samples designed, interviews conducted, documentations, data presentation and data analysis.

1.2 Background of the study

The National Department of Agriculture made funds available to all provinces for drought assistance in order to repair agricultural infrastructure in communal areas, replenish lost livestock, fodder and transportation of fodder.

Under fodder drought relief scheme the costs of fodder and transportation of the fodder were subsidized as follows:

- 90% of total costs for communal farmers
- 80% of total costs for small scale farmers
- 70% of total costs for commercial farmers (National Department of Agriculture, Directorate of Agricultural Disaster Risk Management, 2008).

The drought relief scheme funds also covered the costs for drilling and repairing of boreholes. Assistance in this regard for total costs allocation for the different farmers was the same as that of the fodder drought relief scheme. The allocated funds for fodder were only to be used for the purchase of fodder (National Department of Agriculture, Directorate of Agricultural Disaster Risk Management, 2008).

The drought fodder relief funds were granted on the assumption that the farmers were adhering to the correct farming management principle such as the carrying capacity of the land. That is the correct stocking rate on the farm, and no overgrazing practices occurred. The scheme operated in accordance to relevant official notices and prescripts with specific reference to the Disaster Management Act (South Africa, 2002) and the Public Finance Management Act (South Africa, 1999) as amended.

The disaster risk management plan of the National Department of Agriculture suggested that the current assistance schemes should not be designed to replace what the farmers had lost, but to enable them to continue farming despite the setbacks brought about by disasters. Similarly it should not cover insured or insurable assets such as infrastructure (Van Zyl, 2006).

1.3 Description of Study Area

The study focused on rural communal farming areas of Polokwane Municipality located in Capricorn District in Limpopo Province between 22°24¸30˽ to 24°25¸00˽ south of latitudinal lines and 29°24¸30˽ to 30°38 ¸00˽east of longitudinal lines. The total surface area is 3 775 square kilometres and its population is about 561 770 (Polokwane Municipality Integrated Development Plan, 2007).

There were 900 communal livestock farmers in Polokwane according to the Polokwane local animal office (2010). The rainfall in Limpopo is erratic with an average summer rainfall of 800 mm per annum, hence the prevalence of drought.

The communitiesô livelihoods in the areas depend on agriculture. Livestock sales and dry land cropping are the main source of income and their livelihoods respectively. Dry land cropping fields are used as grazing areas after harvesting the crops. Livestock farming in communal areas is not properly managed because of share ownership and control of natural resources such as land and water (Polokwane Municipality Integrated Development Plan, 2007).

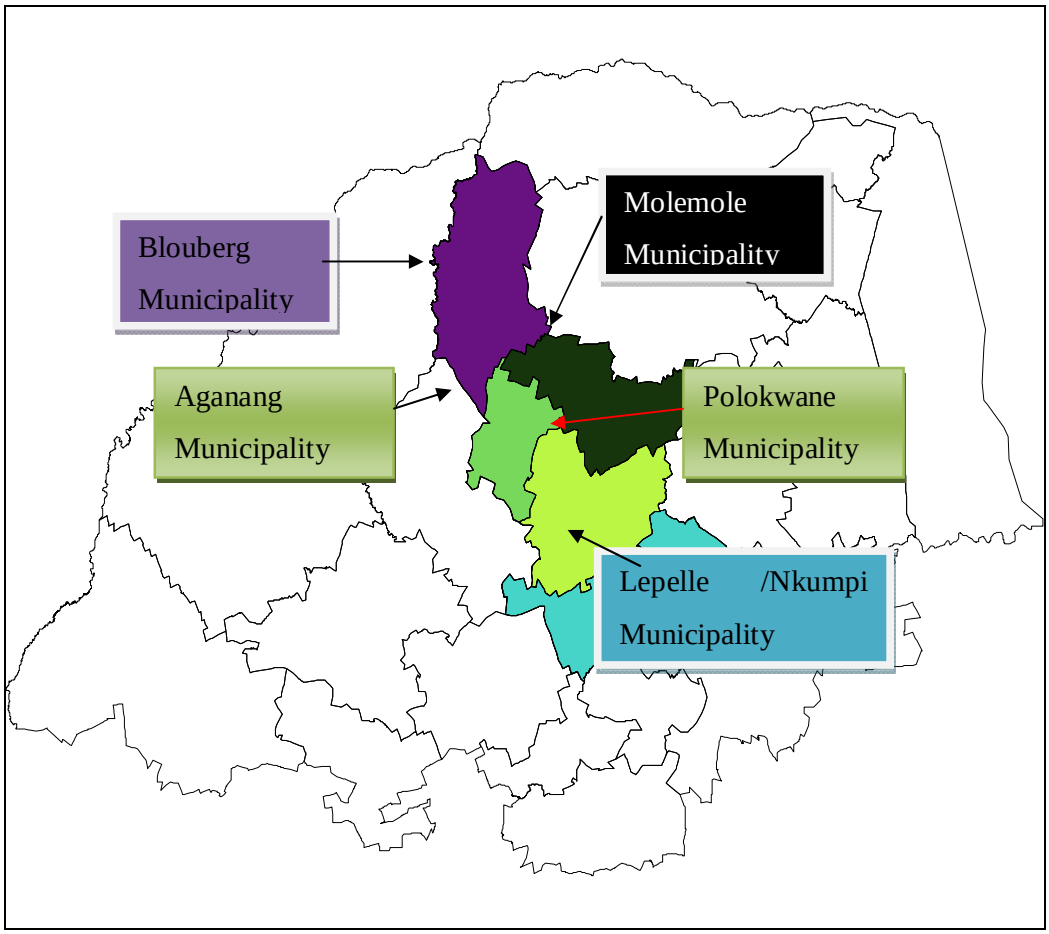

Figure 1.1: Illustration of the study area *(Source: Adoption from Capricorn District Municipality, GIS*)

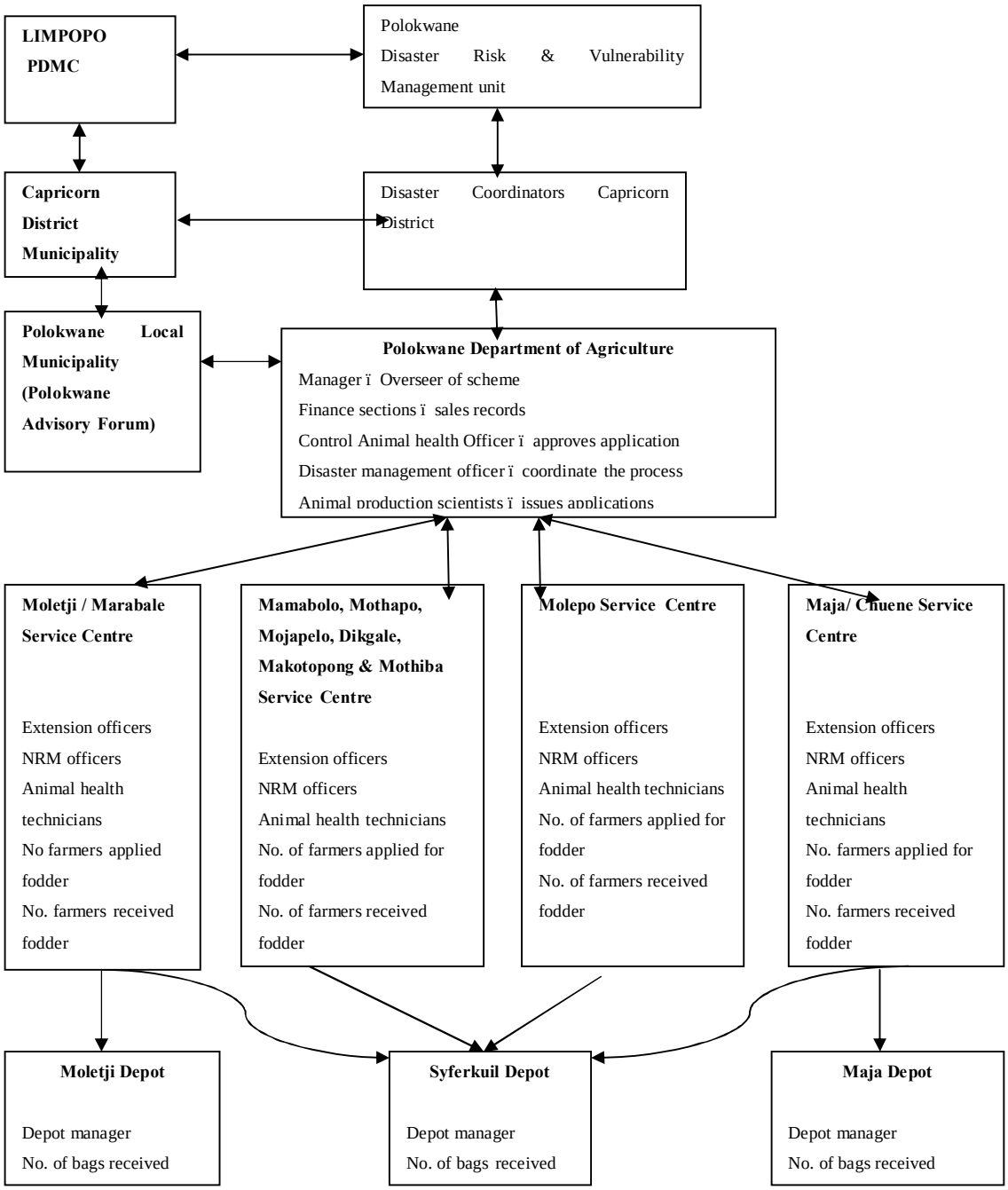

Figure 1.2: Representation of Polokwane Municipality Fodder Scheme (Polokwane Operational structure)

Figure 1.2 shows how Polokwane municipality is functioning in terms of service centres and how agricultural staff and farmers were sampled for research purposes. The figure indicates the functionality of disaster management in Polokwane municipality, under the Provincial Department of Agriculture.

The Department of Agriculture as part of NDAF plays the lead role in all agricultural disaster issues and report everything to the National, District and Municipal Disaster Advisory Fora. Polokwane Municipality as part of the Provincial Department of Agriculture is responsible for reporting all agricultural disasters to the Polokwane Disaster Advisory Forum and the Capricorn district agricultural department. The Capricorn District municipality will report all types of disasters, including drought, to Limpopo Province Disaster Management Centre (LPDMC) who will report all disasters to the National Disaster Management Centre of South Africa.

The Polokwane Municipality Department of Agriculture has four service centres to render services to their farmers and they are Chuene/Maja, Molepo/Mothapo, Mankweng and Moletji service centres. The Polokwane Municipality Department of Agriculture has three depots serving farmers with fodder. The establishment of depots was aimed at reducing the cost of transport for poor farmers to collect fodder from the local office. The depots are Moletji tribal authority office, Maja tribal office and Syferkuil agricultural office. Moletji and Maja were shut down due to poor storage facilities and security of the officials collecting money for purchases of fodder. Syferkuil is the only depot in Polokwane municipality serving all farmers of which some reside 70 km from the depot (Polokwane Municipality Department Agriculture, 2010).

1.4 Problem description

The implementation of the drought relief scheme on fodder and its transportation for livestock farmers in 1998/99, 2003/04 and 2004/05 raised many concerns amongst farmers as the beneficiaries of the scheme. The drought relief scheme was designed to assist livestock farmers to maintain their nucleus breed in the drought-prone areas of Polokwane municipality. Registered livestock farmers with livestock cards had to indicate the number of livestock units they owned as approved by animal health officials, and then completed application forms in order for them to participate in the fodder drought relief scheme for communal and small-scale farmers.

The farmers who applied to participate in the fodder drought relief scheme bought and collected their fodder from local depots and they had to use their own transport to collect it.

The commercial and small-scale farmers had the option to apply for fodder to be delivered at the departmental depots instead of applying directly from suppliers as prescribed by the drought relief framework.

The registered farmers claimed that the fodder scheme benefited some individuals in the farming community who bought more than they were supposed to get, and that led to others not getting their quotas. Other farmers claimed that those who benefited more sold fodder at market price to those who had not received fodder. Some small-scale and commercial farmers applied and purchased the fodder for their livestock on time at the departmental depots.

1.5 The objective of the study

The objectives of the study were to assess whether the livestock fodder drought relief scheme was implemented according to the predetermined criteria, and to recommend action to be taken for the improvement of the scheme if any.

1.6 Research questions

This research endeavours to answer the following questions:

- Are the intended beneficiaries who applied for assistance benefiting according to the guidelines?
- Is the fodder reaching the intended beneficiaries?
- Are the farmers adhering to the correct farming management principles for optimum resources utilization as pro-active action to reduce the impact of drought disaster?
- How is the fodder distributed among the farmers at the depot?

1.7 Delineation of the research problem

The study focused on three depots serving four cluster areas under Polokwane municipality which are Maja/Chuene cluster; Molepo, Mojapelo and Mothapo cluster; Mothiba, Makotopong, Mamabolo and Dikagle cluster and Moletjie / Maraba cluster. The study focused on communal farmers, small-scale farmers and commercial farmers who bought

fodder from the depots. The small-scale farmers and commercial farmers who bought from the depots were regarded as communal farmers and the same benefits applied to them.

The study excluded commercial and small-scale farmers who benefited directly from buying fodder from the suppliers appointed by the department of agriculture to render services directly to the farmers.

1.8 Limitation of the research

There was limited time available for data collection that impacted negatively on the quality of the research. The time available for the researcher to reach the respondents was limited due to the availability of respondents. The communal farmers who were part-time farmers were not available during the day. The availability of resources such as human resources (e.g. language editor and expert in questionnaire design), funding for transport, stationery and communication systems prolonged the successful completion of the study (Leedy & Ormrod, 2001).

1.9 Ethical consideration

The researcher did not expose the respondents to unnecessary physical or psychological harm. The respondents were advised about the purpose of the research before interviews, and they allowed the researcher to proceed with the interviews. The research participants were briefed about the nature of the study to be conducted, and was given permission the option to participate or not. The respondents were briefed on their rights to privacy whereby the researcher would not reveal their responses to the public without permission from them (Leedy & Ormrod, 2001; Mouton, 2001).

1.10 Research methodology

1.10.1 Sample design

Probability sampling refers to sampling design where each member of the livestock farmers in the Polokwane Municipality will have an equal chance of being selected while in non-probability sampling, some members of the population have little or no chance of being

chosen for participants. Proportional stratified sampling was used in this study for sampling design. It is a type of probability sampling whereby different layers (strata) of different types of individuals are clearly grouped and sampled according to the size of the groups. The benefit of stratified sampling is to guarantee the equal representation of identified strata (Eiselen, 1992; Mouton, 2001).

The four clusters or service centres in the Polokwane Municipality were used as strata whereby livestock farmers were sampled proportionally for the interviews. Within the household the breadwinner was interviewed or provided with a questionnaire.

The sample of 249 farmers was drawn from 875 farmers on the database of livestock farmers who applied for the drought relief scheme during 2007/08 financial year, which was extended to 2008/09 financial year in the Polokwane Municipality. To ensure fair population representation 249 farmers were interviewed during March, April, May and June 2010.

The officials working closely with farmers in those areas with regard to the drought relief scheme were also interviewed regarding the implementation of the scheme. Local agricultural technicians, animal health officers and natural resource technicians were used to meet with those farmers (Day, 1993; Eiselen, 1992; Mouton, 2001).

1.10.2 Interviews

Semi-structured types of interviews with one or more individually tailored questions to get clarification or probe the respondentôs reasoning were used in this study. Face to face interviews were conducted. It was possible to get greater response from the participants and control over the environment as non-verbal behaviour could be observed and the researcher could clarify incomprehensible concepts (Leedy & Ormrod, 2001).

Two questionnaires were designed to gather information from farmers and officials who were the beneficiaries of the scheme and administrators from the drought relief scheme in the Municipality. Meetings were organized with livestock farmers at different villages using local agricultural extension officers, animal health officials and NRM officials in the service centres. The Department of Agriculture officials from the district office, municipal office,

local service centres and Capricorn District Municipality Disaster Management Centre and Polokwane Municipality National Disaster Management Centre were interviewed.

1.10.3 Documentations

The National Department of Agriculture Drought Relief Framework was one of the main documents to guide us with the implementation of the scheme throughout the process of drought relief implementation. Copies of the application forms were compiled and approved by animal stock inspectors. Hard copies and electronic database of farmers who applied and benefited from fodder scheme, delivery notes of fodder delivered at depots and copies of issued vouchers were the most reliable documents relevant to the study. Monthly progress reports, final detailed reports at the end of scheme implementation, audited financial reports and data of all farmers who benefited from the schemes were documents that were used as references. According to Leedy and Ormrod (2001), those were the reliable documents to be used.

1.11 Data presentation and analysis

A computer programme with excel software was used to capture and analyze data. Data collected during interviews were organized and coded into categorical and continuous data. Categorical data were grouped in ordinal and nominal data. The examples of nominal data were gender and service centre names while those of ordinal variables were age group and education levels. The examples of continuous variables are interval variables and ratio variables.

Number of bags per farmer and number of livestock per farmer were examples of continuous variables. Contingency tables and different charts were used to present summary of data. Contingency tables and different charts show frequencies distributions, probabilities distributions and cumulative distributions of variables. Categorical data analysed data using the mean and median while continuous variables presented the sample mean and standard deviation, sample skewness distribution, and quartiles distributions were used to display summary data. Data analysis was based on central tendency, relationship and the variability of variables investigated (Eiselen, 1992, Leedey & Ormrod, 2001).

1.12 Conclusion

The chapter described the implementation of the fodder drought relief scheme that created the challenges of the communal farmers who benefited from the fodder relief scheme at departmental depots. The challenges were created when small-scale and commercial farmers who were supposed to benefit from buying fodder directly from the supplier to farms, bought from the departmental depots. An evaluation of case studies of the implementation of the fodder drought relief scheme for 2007/08 was conducted to assess the viability of the scheme regarding communal livestock farmers.

Livestock farmers benefited from the fodder relief scheme and officials from the department of agriculture implementing the scheme in the area were interviewed, and they completed questionnaires. Documents such as acts, regulations, frameworks and records were used to obtain additional information. Data presentation and analysis were done using a computer with a micro excel software programme.

Data collected were categorized and ranked, presented in contingency with frequencies and probabilities. The next chapter is a literature review of the drought relief scheme related documents.

CHAPTER 2

DISASTER RELIEF SCHEME: A THEORETICAL OVERVIEW

2.1 Introduction

The theoretical overview of a drought relief scheme referred to in legislation, policies, agreements and theoretical models that deal with drought relief scheme implementation from the international, regional, national and local levels of the governments will be discussed. The chapter enhances the understanding of developing and implementing both legislation and policy related to drought relief schemes for livestock farmers at all levels of intervention.

The chapter looks at international agenda and resolutions, international agenciesô implementing of disaster policies, the models for drought risk reductions and disaster preparedness frameworks of interventions, and compared them with South African legislation and policy framework.

2.2 Livestock fodder drought relief scheme

Drought disaster referred to damages caused by the deficiency of precipitation or rainfall over an extended period of time. Agricultural drought is described as a prolonged, abnormal dry period when there is insufficient water for usersô normal needs, and agriculture suffers first. Fodder drought relief scheme is the last phase of disaster drought risk management. Disaster drought risk management principles such as prevention and mitigation strategies should be applied, and then the fodder drought relief scheme came as response mechanism (National Department of Agriculture, Directorate of Agricultural Disaster Risk Management, 1999, 2002, 2007, 2008; Department of Provincial and Local government, 2008).

The fodder drought relief scheme reduces the livestock mortality during drought disaster. Fodder drought relief scheme is a relief measure to mitigate the negative impact disaster drought has on the livestock farming communities. According to the Disaster Management Cycle, a fodder relief scheme is part of the response by the government to reduce the negative

impact of drought (National Department of Agriculture, Directorate of Agricultural Disaster Risk Management, 1999, 2002, 2007, 2008; Department of Provincial and Local government, 2008).

2.3 International agenda and resolutions

United Nations (UN) adopted an integrated, multi-hazard approach for addressing vulnerability, risk assessment and disaster management which includes prevention, mitigation, preparedness, response and recovery of natural and manmade disasters. The UN plan of implementation on sustainable development advocated the efforts to promote integrated economic, social and environmental developments as three pillars of sustainable development. They identified poverty eradication, changing unsustainable patterns of production and consumption and protecting and managing the natural resource base of economic and social development as key objectives and essential requirement for sustainable development (United Nations General Assembly, 2002).

Member States of UN were encouraged to support the activities that reduce the risk associated with drought and desertification from 2006 to 2007. UN members were encouraged to form partnerships that integrate early warnings and disaster risk management into sustainable agenda and practices. World Meteorological Organization (WMO) was assigned with responsibility to develop integrated early warning for disaster risk management for the period 2004 to 2011. WMO is responsible for development of a water agenda and drought management activating drought preparedness and mitigation programmes to promote climate information in the decision-making by farmers.

NEPAD has to develop strategic policy on emergency prevention, preparedness assessment, mitigation and response.

UN carried out the Regional outreach activities in support of International Strategy for Disaster Reduction in Africa in partnerships with Economic Community of West African States (ECOWAS) and Southern African Development Communities (SADC) in areas of advocacy, information and policy development for disaster risk reduction. The water agenda and drought activities adopted a drought preparedness and mitigation programmes to promote climate information in decision making by farmers with the assistance from WMO.

Agenda 21 was initiated to reduce the negative impact of natural hazards such as drought on communities and development processes. The UN member States were encouraged to take actions to reduce the negative impact of the extreme events related to weather (United Nations General Assembly, 2003a & 3003b).

UN member States identified areas to be included in the framework of action, and declared as Hyogo declaration and Framework of action for 2005 to 2015 in order to building resilience of the nations and communities to disasters. The specific priorities for actions are as follows: making risk reduction a priority:

- improving risk information and early warning
- building a culture of safety and resilience
- reducing the risk in key sectors
- strengthening preparedness for response.

The roles and responsibilities of States, regional organizations and international organizations in relation to disaster risk reduction were outlines, and provided guidelines to relevant role players reducing risk of disaster (UN/ISDR, 2005 & 2007; Sarmiento, 2008).

The introduction of local Agenda 21 enhanced sustainable development because it adopted comprehensive drought preparedness and drought relief scheme programmes, including self-help arrangements for drought-prone areas. The main objective of Agenda 21 was to develop and integrate drought relief schemes and the environmental coping strategies at national and regional development planning. Agenda 21 management activities were the establishment of contingency arrangements where necessary for food and fodder distribution and water supply (UN Department of Social Affairs, Sustainable Development, 2005).

The global overview of institutional and legislative systems for disaster risk management has broken down into legal and regulatory framework, policy and planning, organizational aspects, resources and capacities and partnership. The governance of DRM conceptual framework was aimed at, among others things, elevating disaster management as a policy priority, generating political commitment and assigning accountability for disaster loss and

impact. The status of institutional and legislative systems of the countries are examined and major lessons learned are recorded and corrected where possible (UNDP, 2007; Sarmiento, 2008).

2.4 International agencies implementing disaster policies

The Inter-American Development Bank as a donor-funded institution for disaster activities has adopted a risk management policy that applied to both private and public sector activities and to the Multi-lateral Investment Funds. The institution assisted nations and countries in development and implementation of disaster risk management of strategies and programme dialogues, financial and non-financial products for the public and private sector operations.

Their policy addressed the prevention and mitigation of disaster that occur as a result of natural hazards, through programming and proactive project works and post disaster response to the impacts of natural hazards and physical damages. Their policy covered the events of low frequency or high consequence hazards and high frequency or low consequence hazards. Low frequency hazards resulted in a ñdeclaredò disaster exceeding the coping ability of the affected country or community using its own resource (Inter-American development bank, 2005; Sarmiento, 2008).

2.5 Model study for drought disaster risk reductions

2.5.1 Disaster Risk Management Cycle

Disaster management cycle as seen in Figure 2.1 has disaster risk management and disaster crisis management. Disaster risk management are activities taken in advance to reduce the risk of disaster happening while disaster crisis management referred to activities taken to reduce the impact of disaster when it struck. The activities related to disaster risk reduction are preparedness, prediction and early warning as well as mitigation and prevention of disasters to happen. The activities of crisis management are disaster impact assessment, response and recovery.

Integrated disaster management must include all activities related to disaster risk reduction as a measuring stick and measures taken in advance to reduce the risk of disaster.

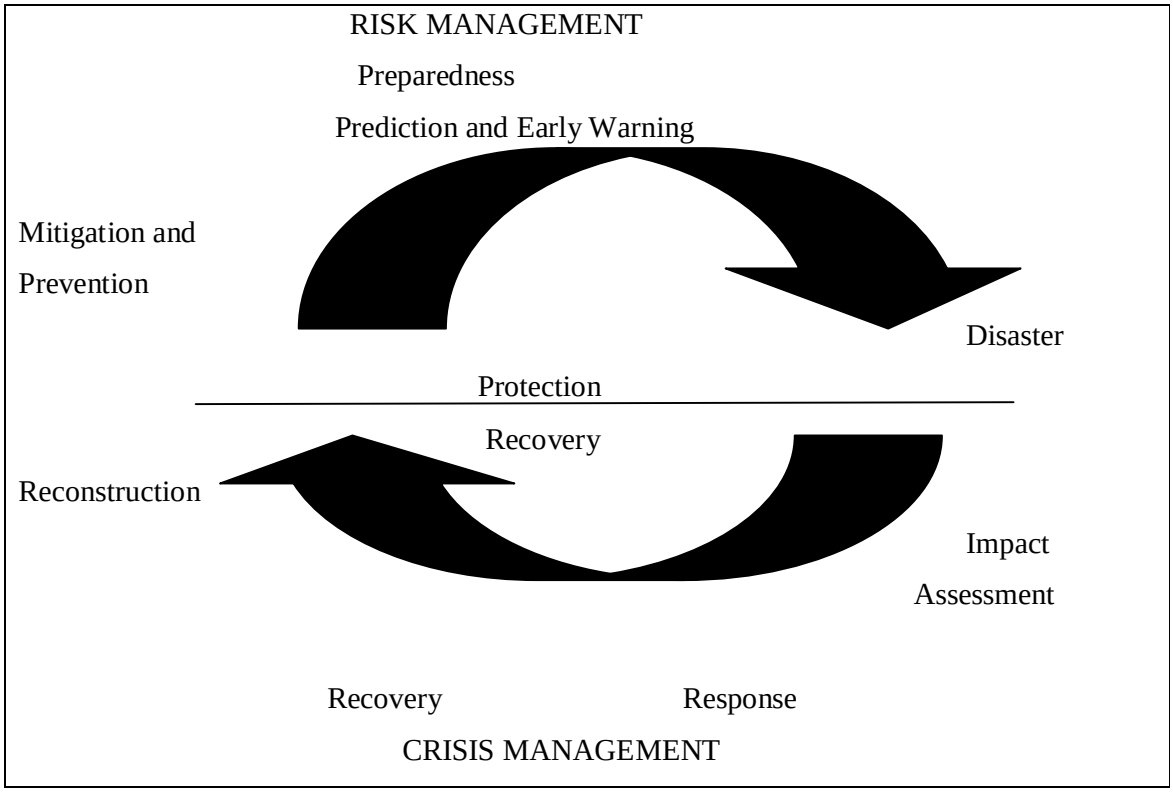

Figure 2.1: Disasters, Risk and Crisis Management Cycle *(Source: Adapted from Wilhite, 1999)*

2.5.2 Disaster risk reduction Framework

The first step of risk assessment and analysis is to determine the specific risk and hazard, and do the drought analysis and the vulnerability and the capacity analysis. The vulnerability or capacity is determined in context of sustainable development by considering socio-cultural, political, economical and ecosystems. Specific hazards are determined in terms of risk factors such as social, economic, physical and environmental factors.

Awareness campaigns are undertaken on the risk assessment and analysis, drought disaster impact and public commitment on the risk and disaster they are facing. The development of knowledge of disaster risk reduction is gained through education and training, and making information dissemination to the public/stakeholders. The last step is the application of risk reduction measures such as environmental management, land use planning, protection of critical and networking and partnership as graphically illustrated in Figure 2.2.

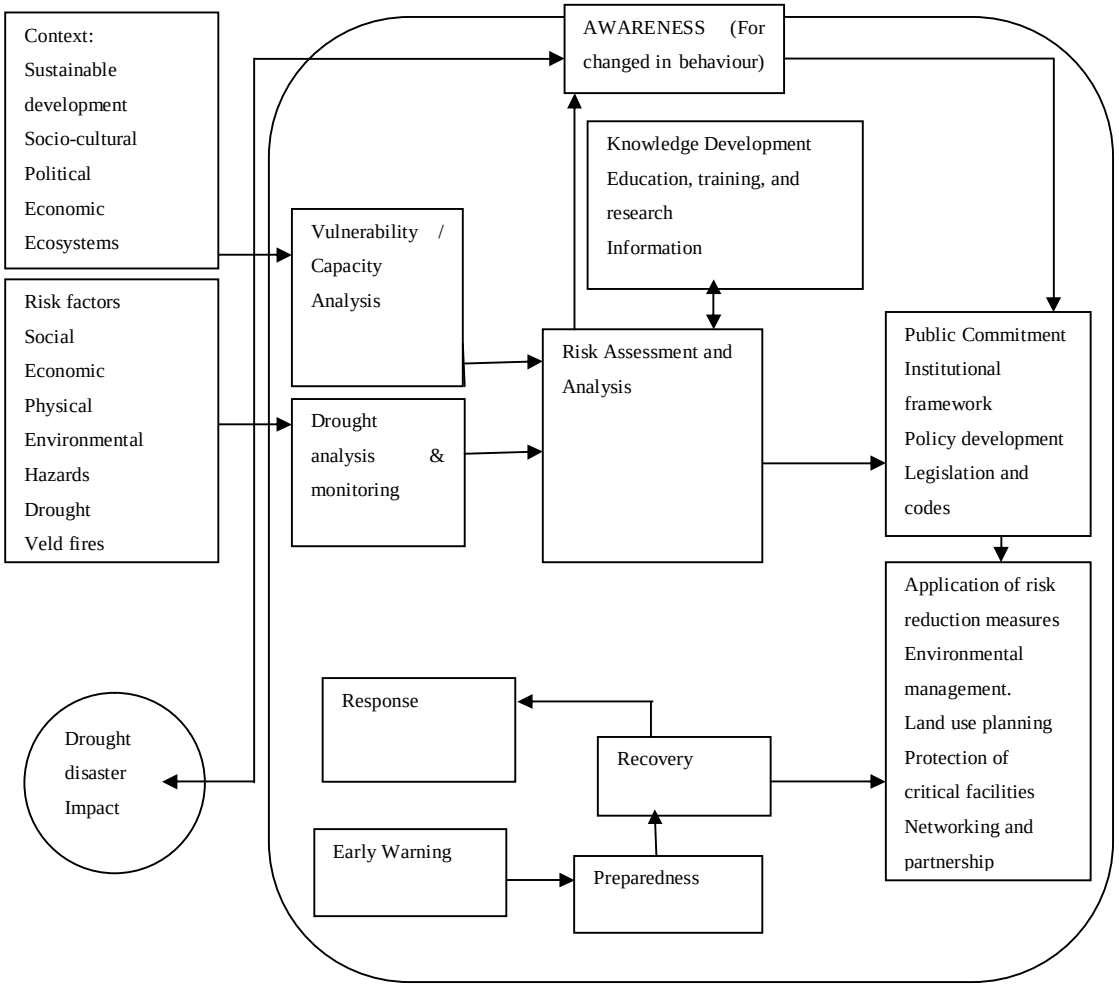

Figure 2.2: Framework for disaster risk reduction *(Source: UN/ISDR, WMO & Asian Disaster Reduction Centre, 2002; Van Zyl 2006)*

2.5.3 Disaster preparedness framework

The study on disaster preparedness provided us with the disaster preparedness framework which has nine key elements to be considered for any disaster phase. They are vulnerability assessment, planning, institutional framework, information systems, resource base, warning systems, resource mechanisms, public education and training and rehearsals (Coburn, Sspense & Pomonis, 1994; Kent, 1994; Smallman & Weir, 1999).

Drought Disaster Relief Preparedness Framework		
Institutional framework • Legislation / policies / standards. • Capitalize on existing structures and networks. • Identify lead agencies and persons.	**Information & warning systems** • Develop info system that is constantly updated and current. • Maximum use of GIS, internet and other disseminating information. • Use structures formed by institutional framework components. • Information must be communicated via modern means.	**Public education/ training** • Formal and informal of imparting knowledge. • Challenge resources. • Identify institutionsôeffective information.
Planning • What to do to protect risk elements? • What recourses are needed? • Look at old hazards and how to regard to them?	**Disaster drought Relief preparedness** • The activities and measures taken in advance to ensure effective activities.	**Response mechanisms** • How do we tell population to activate response identified in plan?
Vulnerability assessment • Who is vulnerable and to what? • Where are they found? • To what are they vulnerable?	**Resources base** • Number of livestock farmers. • Number of livestock. • Quantity of fodder required and available. • Quantity required per LSU & per farmer.	**Rehearsal** • Stimulations of exercises. • Creation of scenarios.

Figure 2.3: Drought Disaster Relief Preparedness Framework (*Source: Disaster preparedness Kent, 1994).*

2.6 Disaster Management Act as national legislation of South Africa

Disaster Management Act 57 of 2002 and the CARA were the main acts regulating drought relief schemes in the country. National Disaster Management Centre was highest to initiate the development of regulation to standardize and regulate the practice and the management of the relief efforts. NDMC was responsible for institutional capacity building, impact assessment, disaster risk reduction and response and recovery activities. NDMC delegated National Department of Agriculture to take the lead in all agricultural-related disasters such as drought. The act encouraged all the role players to include prevention and mitigation measures into disaster management activities as an incentive to be assisted in terms of getting

assistance when disaster struck. Disaster Management Act, (South Africa. 2002) followed the proactive approach to disaster management activities.

The act empowered the National Department of Agriculture to investigate whether the affected provinces, districts and municipalities, authorities and communities tried to prevent and mitigate the impact of drought on their farms and livestock before the approval of the drought relief scheme. If the department was convinced that an attempt was done to mitigate the impact of drought, the drought relief scheme might be approved depending on the availability of funds from the National Treasury (Department of Provincial and Local Government, NDMC, 2002, 2005a, 2005b & 2005c).

NDMC designated the ADRM to develop drought assistance schemes, principles and procedures to guide the provinces in the implementation of a drought relief scheme if drought happened and was declared. ADRM aligned the drought relief scheme principles with those of national disaster framework for a uniform approach to implementation regarding all disasters. The proactive approach to protect agricultural resources such as rangeland management to prevent overgrazing, veldt fire prevention and fire fighting are example measures incorporated in the Drought Relief Frame Implementation plan. In Limpopo Province and Polokwane Municipality, the rural farmers practise farming in communal areas where management of natural resources is limited by shared properties of land and grazing camps. (South Africa. Department of Provincial and Local Government, NDMC, 2002, 2005a, 2005b & 2005c; Department of Agriculture, ADRM, 2009).

2.7 Conclusion

International agendas and resolutions encouraged members of the United Nations and their regions to come up with legislations, policies and programmes that include disaster risk management in development activities for the sustainable management of resources. International agencies supported countries that included disaster risk reduction initiatives into development activities through capacity building at regional and national level. Disaster Management Act 2005 of South Africa addressed the needs for international, regional, national and local communities.

Disaster risk management cycle, disaster risk reduction framework and disaster preparedness framework provided the frameworks from drought risk management activities can be developed and implemented effectively and efficiency. South African legislation is one of the best acts, and compared with the likes of Australia and America (Wilhite, Botterill & Monnik, 2005). Chapter 3 will explain the theoretical overview or legislative overview of a disaster drought relief scheme.

Chapter 3

LITERATURE REVIEW OF DISASTER DROUGHT RELIEF

3.1 Introduction

The literature looked at how other continents, countries and communities handled the implementation of drought relief schemes as compared to South Africa. The main targeted issues considered were the registration and targeting for fodder beneficiaries, the purchasing and transportation of fodder from depots to farm, structural arrangement related to the implementation of the scheme until fodder reached the intended beneficiaries.

The literature reviews also focused on the implementation of drought disaster and legislations, policy framework and resolutions related to the implementation drought disaster fodder relief schemes. The other issues considered were the response mechanism from the countries and communities affected by drought disasters.

3.2 International Implementation of Drought Relief

3.2.1 Implementation of drought relief scheme in Australia

The provision of assistance to farmers during drought in exceptional circumstances in Australia was incorporated in the FARMRISK model as illustrated in Figure 2.1. This was done in order to manage the overall risk profile of the farms related to drought in the various regions. FARMRISK model includes commodity, crop and animal yields, livestock weaning and mortality rates, farm costs and investment and loan interest rates (Thompson & Powell, 1998).

The total farm risk variables include climate variables as part of the total risk management. The risk farm model should develop risk profiles for a range of farming systems based on farm-related sources of risk. The operational issues of exceptional circumstances should be based on the whole farm financial performance analysis; it should not be specific to any

event, but rather it should be a combination of those events. Farmers should prove on applying for assistance that their situation is not due to manageable risk factors such as farm costs and others.

THE FARMRISK Model

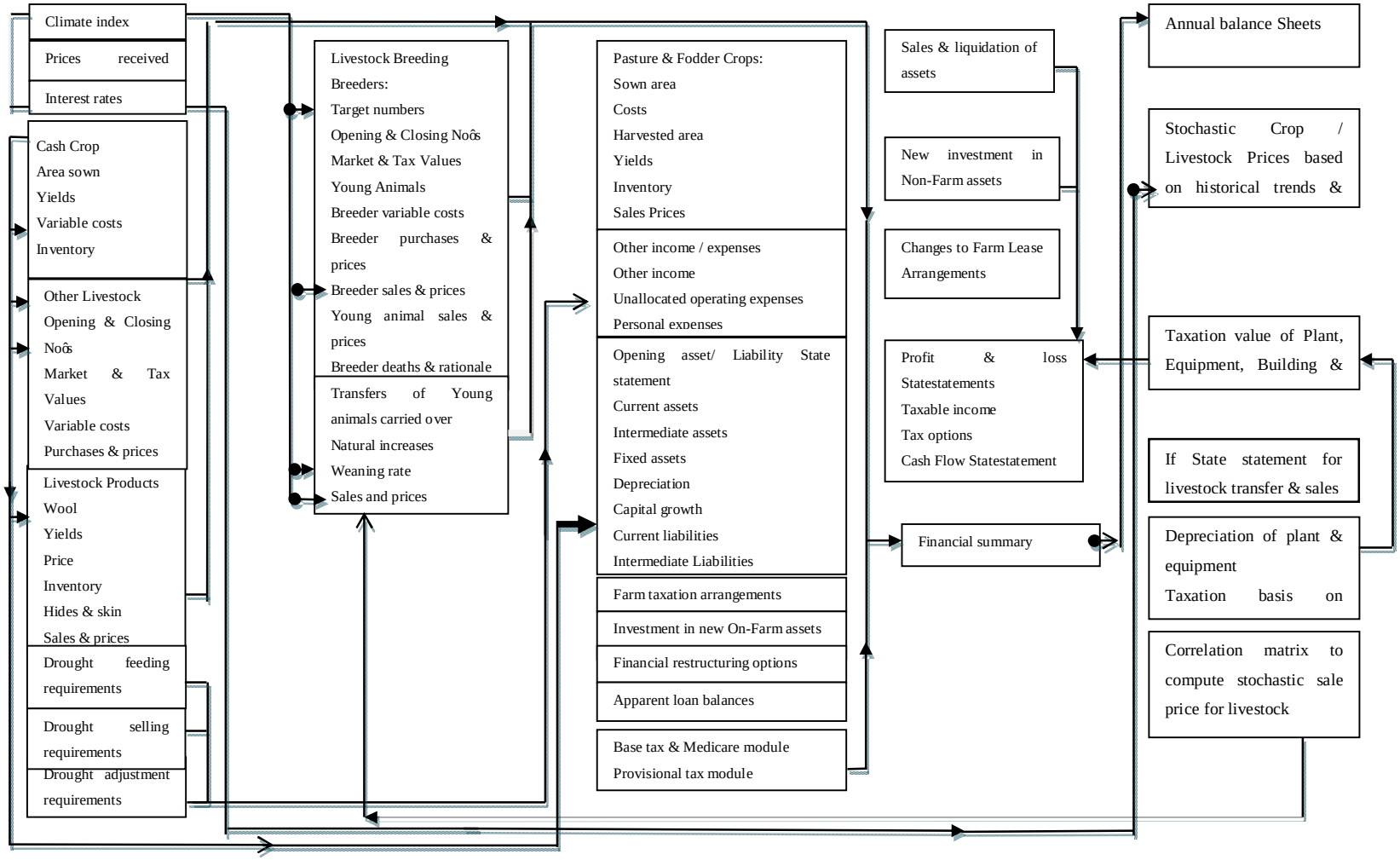

Figure 3.1: THE FARMRISK Model (*Source: Thompson and Powell, 1998)*

3.2.1.1 How to calculate compensation in Australian scenario

According to the drought relief assistance policy, a farmer should be compensated according to his or her Net Farm Income of the year for the whole farm. The guidelines of information gathered by the farmer on the yields, market prices and finances should be defined to the farmer to improve decision-making process (Parris & Takrouri-Jolly, s.a.; Thompson *et al*., 1996; Thompson & Powel, 1998; Worrell, Milham & Curthoys, s.a.).

The study on developing equitable and affordable government responses to drought in Australia enjoyed broad bipartisan support since 1992. The drought relief policy builds on an approach of self-resilient and risk management, allowing farmers to manage the risk of drought over the lifetime of their involvement in agriculture. The drought relief policy should be implemented in such a way to decouple support from drought events and to reinforce the reality that Australia has a highly variable climate. This is the fact of life for farmers.

The policy addressed many equity issues which differentiate farmers by the boundaries of drought and non-drought areas, good managers and poor managers and lastly farmers and non-farming communities. The study addresses the problem of regressively being associated with the provision of subsidies by all tax payers (Botterill & Chapman, 2002).

The evaluation of the equity, effectiveness and efficiency of the implementation of drought relief assistance schemes in Australia (Queensland) targeted livestock producersô strategies and the accessibility of assistance from the scheme. The livestock producers responded to various issues such as self-resilience, protection of natural resources and early recovery of primary industries, carry-on and recovery loans and farm financial counselling for the drought period 2001 to 2004 (Australia. Department of Primary Industries and Fisheries, 2004).

The results indicated that the livestock producers were well prepared for drought and used buying and selling strategy to reduce the lost livestock. The use of drought assistance measures should be subjected to income and asset test. The new policy should add the drought assistance

programme to farmers based on the net income of the farm per annum and asset ownership on farm (Department of Primary Industries and Fisheries, 2004).

3.2.1.2 Australian drought relief loans

Farmers in Australia were provided with drought relief in the form of loans. This would help farmers in farming operations during and after drought to keep business going. The farmer applied for the loan and approval of loans was tied to production potential of the farm.

The farms that produced well received more funds. The advantages of the use of income- related loans were that the loan recovered when farm business had succeeded economically after drought; the returns of some drought-related outlays had the benefit of making additional resource for public sector uses and the movement of drought assistance from grants towards income-related loans.

The challenges of income loan related were adverse selection and top-up income related, sale of the farm business, death of the farmer and bankruptcy. In conclusion, an income related loan for drought relief has the potential to improve the delivery of drought relief to Australian farmers. The recovery of funds from the farmers once their economic position improved could reduce the cost of drought relief to taxpayers and minimize the regression of grant-based scheme. The income relief loans referred to the loan given to farmers based on farm income obtained from the sales of farm products and payable when the farmers released profit from the sales of farm products.

Access to income-related loans could be limited by imposing on the total amount an individual farm could hold in income related loans at any one time. To ensure that farms with poor prospects are not heavily subsidized, income-related loans form top-up to additional commercial credit (Chapman, Botterill & Egan, 2004; NSW Government, 2008).

3.2.2 The drought relief scheme in Asia

In South-West Asia, an evaluation of the implementation of drought relief scheme was conducted with the emphasis on the review and the analysis of drought-related institutions and policies. An assessment was focused on India, Rajasthan, Pakistan and Afghanistan. It was found that both countries were moving from ad-hoc relief implementation measures to drought preparedness and integrated response to drought by all sphere of government. In Pakistan the integrated mechanism was operational while in India drought management was still considered as ad-hoc approach. The end result recommended that both countries should adopt drought preparedness approach against drought crisis management and improve regional drought monitoring and early warning systems (IWMI, 2004).

Before 2001, the pastoral people strategies during drought periods in Pakistan were migration from one area to another without too much restriction. They also used harvested areas for grazing from crop farmers. The crop farmers used livestock manure to fertilize their crop land. The situation changed completely after the introduction of inorganic fertilizers and irrigation schemes whereby pastoral farmers were not allowed to graze their livestock on the irrigated land from crop farmers (Umrani, 2001).

The relationship between crop farmers and pastoral farmers declined due to the introduction of inorganic fertilizers. Pastoral strategies possible for livestock farmers before drought were to move livestock to the area where fodder was available and/or destocking their livestock. During drought they transported fodder to their farms to reduce mortality. The pastoral farmers were encouraged and supported to adopt self-reliance approach to drought risk, to preserve adequate reproductive capacity in livestock herds in the affected areas during drought periods. The farmers should minimize the degradation of natural resources during drought (Umrani, 2001).

United Nations Agencies in partnership with OXFAM and Islamic Relief assisted the Federal and Provincial governments of Pakistan to draw the short-term and long-term recovery plans. The World Bank and Asian Development Bank funded the Drought Emergency and Recovery

Assistance Plan (DERA) for the buying and transportation of fodder from the suppliers to farmers during drought (United Nations, 2001).

The Commonwealth Secretariat wrote the report on the vulnerability of island and coastal communities in the Commonwealth regions in 2004 for the preparation of World Conference on Disaster Reduction. The meeting was organized with the support of United Nations International Disaster Risk Reduction Secretariat to prove the overall ingratiated framework for strengthening early warning systems in the region in the context of multiple hazards, risk management and risk reduction. They established the intergovernmental groups on the Earth Observation and the endorsement of ten year implementation plan to create a Global Observation System of Systems.

Asia is a drought-prone area while Australia is the driest inhabitant continent. Drought conditions in Southï East Asia 2004/5, Northern and South Asia in 2000 and Oceania countries like Australia and New Zealand were experienced in 1997/1998/1999/2000. Agriculture practices in Asia dependent on irrigation and the management of water for different use, is essential. During the above-mentioned droughts all countries were faced with challenges on accepting drought as natural hazards by communities, scientists and policy makers and building awareness on drought. The other challenge was to erase the understanding about drought and the societyôs capacity to mitigate its effects and to convince the policy makers that investment in mitigation is more cost effective than relief programmes (Commonwealth Secretariat, 2005; Liu, 2007).

Asian countries were committed to drought mitigation measures to improve land and water management, to promote agricultural management, provide technology and develop strategies for drought preparedness. It was found that Asia and Oceanic countries did not adopt a drought risk management approach, and it was recommended that in future those countries should have drought risk management in all spheres of the government. The drought institutional reform for drought risk management should include technology and infrastructure for reducing drought. The drought risk management should consider the best practices and new opportunities for drought mitigation and sustainable economic stakeholders such as operational activities, policy

development and implementation and community based programmes (Commonwealth Secretariat, 2005; Liu, 2007)

3.2.3 Government of India's food scheme difficulties

The implementation of the government of India food schemes failed due to implementation and operational problems. The operational problems were insufficient quantity and poor quality, unsatisfactory administration, lack of information and the absence of a grievance- redressed system. The implementation problems were structural problems including corruption, lack of transparency, corruption, reporting mechanism, lack of honesty, acceptance of bribes as a way of life, custom and culture, inadequate training and orientation of government officials and accountability (Cheriyan, 2006 ; Frontline, 2000; Morton, Barton, Collinson & Heath, s.a.; Vikas & Sandeep, 2009).

The occurrence of a natural disaster in any part of the country necessitates State intervention. The roles played by the State vis-à-vis natural disasters were disaster mitigation, disaster preparedness, disaster response and rehabilitation and recovery (Das & Jha, 2004). The Central Government of India appointed commissions to assess the macro-level implications of the present framework/design of the Calamity Relief Fund (CRF) scheme from the population who needed it most; assess how much the CRF scheme was helping the State Governments in meeting expenditure on relief works in the wake of natural calamities; to highlight the irregularities in the implementation of the scheme at ground level; to discuss the approach of the Central Government towards disaster mitigation and preparedness and to suggest modifications in the CRF scheme by the Central Government towards disaster management (Das & Jha, 2004).

The assistance funds from Calamity Relief Fund (CRF) Scheme by the centre was based on an assessment of the damage caused by the calamity and extent of help required by a central team which visited the calamity-affected area for this purpose. The State Governments appointed finance commissions II to VII to investigate the shortcomings of the Margin Money Scheme (Das & Jha, 2004).

The commissions assessed whether the assistance extended to the states was in accordance with their needs and the provision of relief to the victims was quick. The assessment also wanted to check whether the States had greater autonomy in the relief operations and the states were more accountable to their activities regarding relief. The assessment also wanted to check whether the present form of Margin Money Scheme was functioning in terms of benefits derived by the calamity affected populations. It was found the scheme did not meet the State Governmentôs intended objectives (Das & Jha, 2004).

The Ninth Finance Commission was appointed, and recommended the setting up of the CRF scheme to replace Marginal Money Scheme for financing relief expenditure of States during the natural calamities. The Centre Government should provides 75 per cent of the size of the CRF of a State as a non-plan grant to the State while the rest of 25 per cent comes from State Government itself (Das & Jha, 2004).

The Commission recommended the States to create its own Calamity Relief Fund (CRF) to enable the States to incur required levels of expenditure on calamity relief; to avoid delays in the response of a State Government to the occurrence of a natural calamity; to discourage the States from inflating their demands for funds regarding expenditure on relief; to ensure against wasteful expenditure by the States; to provide greater autonomy and responsibility to the States in the relief operations; and to make the States more accountable for their actions in the area of calamity relief (Das & Jha, 2004).

The Tenth Finance Commission was appointed and recommended for setting up a national fund called the National Fund for Calamity Relief (NFCR) for providing assistance to States during the natural calamities of órare severityô. The NFCR was designed to address training of disaster management personnel, to maximize public expenditure during droughts and to adequate financial help to the States, timely State intervention, flexibility and durability of assets created (Das & Jha, 2004).

The Union Government of India appointed the Eleventh Finance Commission to assess the impact of the implementation of the NFCR fund and the results were summarised below. The Eleventh Finance Commission, replaced it by the National Calamity Contingency Fund (NCCF), which was in operation up to 2004 and it functioned over the period 1995-2000.The Eleventh Finance Commission (EFC) recommended that the NCCF be created in the Public Account of the Government of India, receiving its funding through the levy of central taxes. The States were expected to meet relief expenditure from their respective CRF Corpus. The CRF/NCCF scheme funds were used to meeting expenditure for provision of immediate relief to the affected population, and the expenditure should by nature be of short duration (Das & Jha, 2004).

A Committee of Experts was set up in the Ministry of Agriculture, Department of Agriculture and Cooperation under the chairmanship of the Central Relief Commissioner. The Department of Agriculture and Cooperation reviewed and finalized the list of items and norms of expenditure for incurring expenditure from CRF/NCCF for the period of 2000-2005. The Union Government accepted the recommendations of this committee. State Government nominated a State level Committee, to administer the CRF in each State. The nodal ministry for overseeing the functioning of the CRF scheme was the Ministry of Home Affairs of the Union Government (Das & Jha, 2004).

The drought relief measures taken in Baran, Rajasthan 2002-03 lay special emphasis on the troubles of the Sahariyas, who form the most vulnerable section of this regionôs population. The implementation of a fodder drought relief scheme by the government of Rajasthan in India failed due to inadequate scale of relief works, no punishment for incomplete works, ineffective fodder depots , failure of State farms, government officials involved with relief works were ill informed about CRF, and important needs of the villages were ignored (Das & Jha, 2004).

During the 1992-1998 droughts, states thought that the CRF and the NFCR failed to meet the intended objectives due to among other things, the efficiency of the method of determination of size of CRFs for different States; inadequate allocations to CRF; a uniform list of items and norms of expenditure for all the States which is quite unrealistic; time lag in provision of additional assistance to States for severe calamities and centreôs relief assistance to States being

driven by political interests and laxity of State Governments in implementing the schemes (Das & Jha, 2004).

The formula for contribution to CRF, which at present is 75:25 for the Centre and every State, should be changed to accommodate the varying abilities of the different State Governments to spend money on relief. There should be a substantial increase in the sizes of CRFs of all the States. The State level committees had to focus on the relief efforts for the most vulnerable sections of the affected population (Das & Jha, 2004).

The State Governments should take timely action regarding the submission of utilization certificates (for CRF) and annual reports on disasters to the concerned Ministries of the Union Government in order to enhance the release of instalments for CRF. An expert group constituted by the Central Government, with active participation by the Civil Society Organizations, should monitor the relief measures in the States utilizing the CRF (Das & Jha, 2004).

The relief and rehabilitation measures should be focused on physical rebuilding and psychological recovery of the victims from the trauma of disasters. There were needs for the training of personnel; critical measures for mitigation and preparedness; citizensô participation; need for transparency; community level actions and awareness through education (Das & Jha, 2004).

The study of evaluation of feed and fodder development scheme under Centrally Sponsored Schemes in Karnataka was conducted by Agricultural Development and Rural Transformation unit appointed by Central and Governments of India in 2004. The Central and Governments of India developed and implemented Government policy on increasing production of fodder crops and pasture grasses or legumes by using foundation or certified seeds of high yielding varieties using modern technology and improved agronomic practices. The schemes were developed due to the shrinkage and degradation of grazing lands, frequent droughts and changing cropping patterns from dry land to irrigation systems that restrict the movement of cattle. The demand for feed and fodder at the national level and in the arid and semi-arid regions such as Karnataka was larger than the actual availability of it (Bhenda, Deshpande & Thippaiah, 2004).

The Central Government initiated the setting up of regional stations to grow fodder seeds and distribute to States and "Assistance to States for Feed & Fodder Development" to supplement efforts of State Governments in this sphere. The Central government provides detailed guidelines to State Governments for availing funds to implement CS/CSS related to fodder development programme (Bhenda *et al.,* 2004).

The objectives for the evaluation of the schemes were to assess the effectiveness of the schemes for the improvement fodder production; to estimate fodder requirements in the livestock sector in a medium term perspective; to evaluate the fodder development process and locate the growth inhibiting factors in fodder sector and to suggest ways and means to make the schemes more effective and serving the objectives set forth (Bhenda *et al.,* 2004).

The secondary data were collected from the Department of Animal Husbandry and Veterinary Services, government of Karnataka and Annual Reports of various schemes operating in the Department of Fodder Development. The list of Livestock Breeding Farms /Training Centres in the state was obtained from the State Department of Animal Husbandry and Veterinary Services, Bangalore. The secondary data relating to financial allocations, actual releases and expenditure for each scheme were collected. The land use pattern at the district level and Livestock census were collected to analyze the trends in area available for grazing and projection of fodder respectively (Bhenda *et al.,* 2004).

Primary data were collected from various stakeholders by canvassing pre-tested structured schedules and questionnaires. The required data were collected from livestock breeding centres/farms, beneficiary households and villages. The information was collected on various aspects like land use, infrastructure, fodder seed and fodder production, details about the financial and physical targets achieved in respect of feed and fodder schemes, etc. The officials of the livestock breeding farms were also interviewed to ascertain the constraints faced by them in the implementation of schemes and suggestions for the effective implementation of CS/CSS of feed and fodder development (Bhenda *et al.,* 2004).

The livestock farms from the state land were having more unutilized land that could use for the plantation fodder for livestock and it was about 70% of total farm land. The lack of resources, man-power and proper planning led to inefficient use of available land. The area under fodder production was divided into irrigated area and rain-fed area on other farms. They main livestock types kept in India that need fodder were cattle and buffalos (Bhenda *et al.,* 2004).

The government of India introduced the schemes on Livestock Farms and financed them from funds of the Central Schemes (CS) and Centrally Sponsored Schemes (CSS) programmes. The schemes were implemented by the State Department of Animal Husbandry and Veterinary Science on the State livestock farms. The feed and fodder development schemes implemented were the establishment of Fodder Bank, establishment of Silvipasture System, grassland development including grass reserves, enrichment of straw and cellulosic waste and distribution of fodder seeds (Bhenda *et al.,* 2004).

The findings from an evaluation of the schemes were that the amount of funds released both by the Centre and State has been less than the allocation made. The actual expenditure incurred was less than the amount released and resulted in a huge unspent balance under some of the schemes. In some schemes, the amount released was relatively less in respect of enrichment of straw, cellulosic waste and grassland development. The implementing agencies could not utilize the released funds as these were released at the end of the financial year and sufficient time was not available for the implementation of the scheme (Bhenda *et al.,* 2004).

The financial assistance provided under the specific CS/CSS was not spent as per the guidelines provided for the schemes. Schemes like Development of Silvipasture System were implemented on the state livestock farms, but without any outcome. The livestock farms that produced tonnes of farm yard manure spent money on the purchase of chemical fertilizers. Some farms bought items like televisions and VCRs and they were part of the implementation of the Silvipasture System (Bhenda *et al.,* 2004).

The State livestock farms available for fodder development were enough and should be properly planned. The farms were managed by Directors/Assistant Directors, classes of workers with

limited power to take decisions on farms. Voluntary retirement from service was recommended for directors in order to reduce operational costs of the farms. The employment of the right people for the job should be encouraged and the agricultural officers/agricultural assistants were recommended for the fodder production schemes. The guidelines provided for implementing the schemes should be strictly followed (Bhenda *et al.,* 2004).

The money spent on the implementation of schemes like development of silvipasture and development of grassland was a waste of funds because communities and local NGOs were not consulted before the implementation of the scheme. The livestock farms engaged in seed production should produce the required quantities of certified seeds on the farms by procuring foundation seeds. There should be active cooperation and coordination among the Department of Animal Husbandry, Forest, Agriculture and Horticulture while implementing schemes like the silvipasture system and development of grassland and grass reserves (Bhenda *et al.,* 2004).

Development of Common pool resources like community pasture/gomal lands/waste and problem soils should involve the participation of the village panchayat and the households. The fodder procurement and distribution should also include public participation. The organisation and administration of the programme should be entrusted to a newly created Livestock Development Board (Bhenda *et al.,* 2004).

The seeds suitable for growing fodder in dry conditions should be developed and distributed to the farmers. Periodical monitoring of schemes should be undertaken by the Department of Animal Husbandry and Veterinary Sciences to see the utilisation of these schemes by the beneficiaries and prevent misuse of the components provided under the schemes. The fodder growing could be encouraged by assuring better buy back arrangements for the registered fodder seed growers. They should be educated in growing conservable fodder and palatable PN grass. Development crop diversification should be encouraged for maintaining fodder security for animals. They should develop new technologies to grow fodder under rain-fed conditions (Bhenda *et al.,* 2004).

3.2.4 Drought relief scheme in MENA region, West Asia and North Africa

Feed subsidy programmes in the MENA region, West Asia, and North Africa region had been successful in protecting livestock and production during drought; however, it had some negative impacts. The negative impacts of the programme, among other things were rangeland degradation due to overgrazing, feeds subsidies added to the fiscal burden on government, subsidies tended to become permanent and proved difficult to target with the lionôs share of subsidized concentrates going to large herders and commercial farmers.

The new possibilities for improved drought management suggested were early warning drought forecasts and rainfall insurance. Area-based rainfall insurance looked good, but it needed further attention. Early warning drought forecasts guided the decision makers such as governments and relief agencies to decide on more effective and cost efficient drought interventions and a decision-making tool for farmers to minimize losses due to climate variability (Blench & Merriage, 1999; Hazell, Oram & Chaherli, 2001; Hazell, s.a;)

3.2.5 Acts of God versus science: drought and demagoguery in Brazil

The communities in Northern Brazil believed that the occurrences of drought and climate variability as an act from God while policy makers adopted a scientific approach without incorporating the communityôs perception. A survey on drought and demagoguery based on a political ecology of climate variability in Northern Brazil at Ceara was conducted in 1972. The government established a research centre to deal with meteorology and water resources to include climate variability in policy making. The policy makers imposed the release of credit and seeds based on climate forecast, and it was seen as a political view by communities who refused to implement the programme that was seen as the enemy of God by the public. The research unit then changed its mission by separating the release of credit and seeds from the climate forecast. The research unit focused on the long-term impact of drought and the development strategies to adapt to drought in consultation communities, and the new initiative was accepted by the community (Finan, 1999).

3.2.6 United States of America

The USA adopted a national drought policy achieved through the enhancement of monitoring and early warning, risk and impact assessment, mitigation and response and future plans by local and federal states. They adopted the well-conceived policies with preparedness plans and mitigation programmes as a means to reduce social vulnerability and the risk associated with drought (Wilhite, Hayes & Knutson, 2005; Wilhite, s.a.).

The USA drought policy which integrates the preparedness planning has received increasing attention from the governments, international and regional organizations and nongovernmental organizations. The USA drought risk reduction strategy incorporated the availability of timely and reliable information to base decisions; policies and institutional arrangements encourage the assessment; appropriate risk management measures for decision makers and effective and consistent actions by decision makers (Wilhite *et al.,* 2005).

The Western States as region in USA established the preparedness and mitigation working group called Western Drought Coordination Council. They developed steps to be followed for identifying actions to be taken to reduce the potential impact of drought before it occurred. They began by bringing together all the affected people and supplied them with adequate data to make informed decisions during the process. They assisted the affected communities to identify high priority drought impacts that were relevant to the usersô location or activities. They made the users to understand the environmental, economic and social causes of the impacts. They assisted the users to utilize that information to identify feasible, cost-effective and equitable actions that could address the identified causes. The countryôs spheres of governments were provided with guidelines of establishing drought risk management plans (Albama Drought Plan, 2004; Drought Prediction, Prevention and Response, 2002; Knutson, Hayes & Phillips, 1998; USA. Mediterranean Drought Preparedness and Mitigation Plan, s.a.; Ute Water Conservancy District, 2003).

The Alabama Drought Management Plan as regional plan defined the process to address drought-related activities such as monitoring climate conditions, vulnerability assessment,

impact assessment and response and mitigation. Their plan catered state wide regional structures to identify different areas affected by drought conditions, identify risks associated with the drought conditions and identification of possible risk avoidance strategies. Their plan developed drought triggers and indicators, and provided the guidelines for response to drought conditions at various sectors impacted by droughts (USA. Office of Water Resource, 2004).

The Department of Agriculture at Alberta developed a drought risk management plan which incorporated all the role players to share responsibilities. Department Alberta Agriculture provided scientific and technical input, developed educational materials and recommended delivery of programmes. Municipalities and agricultural industry organizations worked together during planning and implementation of drought in the area. The timely, effective action during the normal conditions, drought alert and drought were drawn and implemented in a joint venture of the role players (USA. Government of Alberta, 2002-2007).

The science committee of Utah as part of an institutional arrangement of the State and Federal States stated the importance of the drought aid, but not the solution to the drought problems. They suggested the use of technology to monitor drought and to prepare activities to reduce drought impact (Potter, 2002). They used Palmer Drought Severity Index (PDSI), Standardized Precipitation Index (SPI), the El Niño-Southern Oscillation (ENSO) and North Atlantic Oscillation to detect the severity of drought Utah and Western states for 2002/2003/2004/2005 (Finney, 2004; USA. Drought Prediction, Prevention and Response, 2002).

Drought was declared in the 20 states including Utah and they requested assistance from the State of Utah and Federal agencies, including the U.S. Bureau of Reclamation, Bureau of Land Management, the U.S. Forest Service and the U.S. Department of Agriculture. Prior to the Governor's formal Drought Emergency Declaration, the State Drought Response Plan was already in operation. The State Drought Review and Reporting Committee met on a regular basis, to brief on the state wide drought situation and discussed potential relief actions. With the Governor's formal drought emergency declaration, the Drought Response Committee was activated. This committee met regularly to discuss drought impacts and coordinate response action. Drought relief assistance was successfully implemented in the USA during 2002/03

drought disaster (USA. Drought Prediction, Prevention and Response, 2002). A drought committee meeting was held in Monticello, Utah, to discuss possible mitigation and response measures that could be taken to reduce the impacts of the drought for San Juan County. In attendance at the meeting were representatives from Federal State and local government agencies as well as representatives from the local farming, ranching, banking and real estate, commercial and industrial sectors. Some of the mitigation measures discussed at the meeting were funding for drilling of wells to secure adequate water supplies for fire suppression, transporting of feed for cattle, and the opening up of Conservation Reserve Program Land for livestock grazing (USA. Drought Prediction, Prevention and Response, 2002).

The Farm Service Agency representatives secured a temporary allowance of grazing on the Conservation Reserve Program (CRP) lands. It was agreed by all present that such action would help mitigate the impact the droughts had had, and would continue to have on the availability of feed for livestock. The decision to allow grazing on CRP lands was made nationally and the Farm Service lifted grazing restrictions for the San Juan County and other southern Utah counties that also faced severe drought conditions (Alabama Drought Plan, 2004; USA. Drought Prediction, Prevention and Response, 2002; Ute Water Conservancy District, 2003).

Dissemination of information regarding the drought situation and raising public awareness about the critical nature of Utah's water supply levels had been effective. The state and other water agencies worked with the local news media (television, newspapers and radio) to keep the general public aware of the drought situation and informed about ways the average citizen could help. Public response and support had been gratifying (Alabama Drought Plan, 2004; USA. Drought Prediction, Prevention and Response, 2002; Ute Water Conservancy District, 2003).

3.3 Drought Relief in Africa

The implementation of drought relief in Africa entails assisting community with food aid, water supply for people and its livelihoods as well as fodder for the livestock. Fodder relief scheme is part of the assistance provided to the rural farming community in order to reduce loss to farming communities.

The implementation of relief assistance by relief agencies other than government in the horn of Africa during May 2009 to October 2009 in Djibouti, Kenya and Ethiopia were aiming at supporting marginal farmers, agro-pastoralists, the landless pastoralists who had become food insecure to restore and strengthen their livelihoods through a range of schemes including asset replacement, conditional cash grant and strengthening of community structures. Farmers in Djibouti, Kenya and Ethiopia were trained in fodder production and supported to form pastoral associations. The other objective was to incorporate risk reduction efforts and capacity building with support to pastoralists (Aklilu & Wekesa, 2002; International Federation of Red Cross and Red Crescent Societies, 2009; UNAID/ETHOPIA, 2006).

3.3.1 Drought relief scheme in Kenya

Evaluation of the improvement of drought response in pastoral areas of Kenya through emergency interventions indicated that they were not designed to address the vulnerability that characterizes the arid and semi-arid lands. The key issues were early warning and assessment, preparedness and implementation capacity of all stakeholders involved during the implementation disaster risk management.

Early warning was implemented by government and relief agencies operating in Kenya and both of them did not have enough funds for interventions and that was a limiting factor for effective intervention. Effective livelihoods interventions required effective coordination. Drought response was handled by the Office of the President while long-term development was handled by the Agricultural Sector Coordination Unit. Kenya responded by creating a new Ministry of Development of Northern Kenya and other arid and semi-arid lands and it was promising (Aklilu & Wekesa, 2002; Longley & Wekesa, s.a.).

A study of the development of policy on the range and pastoral industry with special reference to Kenya was conducted. The methodologies used for development were bottom-up community involvement, GBOs with local technical knowledge who best understood their environment. Some of the policy directions were community needs assessment, education and training, post

modernism, pastoral development, livestock development, participatory action research and multi-disciplinary and multipurpose approaches (Musimba & Nyariki, 2003).

The objective of a relief programme was to prevent the loss of lives and livelihoods in the Wajir District of Kenya. The ñentitlement approachò to relief food distribution means individuals have the right to a certain quantity of relief. The principles of entitlement are transparency and openness in the method of distribution, accountability within the system and fairness and equity in terms of allocating food per person.

3.3.1.1 Entitlement approach

- Registration of the whole population in the area by families and by name.
- Designation of women as recipients of relief.
- Allowing pastoralists who migrate with their animals to transfer their names from register of one distribution centre to another.
- Appointment of local relief committees.
- Assignment of an OXFAM food monitor to each distribution centre.
- Working with local committee.
- Networking of dispersed distribution centres to prevent large concentration of people around the main centre.
- Checking registers for neighbouring distribution centres against each other for evidence of double registration for least the first two monthly distributions.
- Appointing women as household heads.

Issues that arose in Wajir were that some eligible beneficiaries were missed out during registration; neighbouring farmers who were not served were attracted by the scheme; food allocated to districts was not enough to meet the original ration rate per person. Issues to be considered were registration of women, targeting, transparency and regularity of food distribution and appropriateness of the relief commodities (Buchanan-Smith & Barton, 1999; Elaine, 1998).

The drought relief scheme was implemented by VITSAT relief agency. The objective of the scheme was to make fodder available to all households in India and each household was eligible for subsidy of two cattle. Community members benefited from the scheme at different cost prices of the fodder. Members of the drought relief scheme paid less than the non-members of the scheme.

Households became members irrespective of whether they had cattle or not. The member without livestock bought the fodder and sold it to those who had cattle. VITSAT relief agency raised or loaned funds from donors to buy the fodder and sold it to the community. Money raised from the community when buying fodder was deposited into bank as a community trust account. The funds collected, financed the drought mitigation activities for the communities for the following years as the country was annually experiencing droughts during winter.

In implementing the programme VITSAT or other relief agencies involved all stakeholders in planning, developing and implementation of the drought relief scheme. Each role player was given the responsibility and acted according to line function. A participatory approach was used in all phases of the programme, starting from needs assessment, evaluation assessment and programme monitoring. The drought relief scheme programme achieved its goals through monitoring and participatory evaluation of the drought relief programme (Aklilu & Wekesa, 2002; Misra, 1990; Morton, Barton, Collinson & Heath, s.a.; Mudrakartha, 2002; Pellegri, Kormoss & Wendt, 2002).

3.3.2 Disaster drought relief scheme in Namibia

A study on the implementation of the drought relief scheme in Namibia for the 1992/93 drought period in December 1998 on livestock farming coping strategies was conducted. The drought relief scheme targeted both farmers in communal and commercial areas. The problems encountered in Namibia were the same as those experienced in the implementation of the 1992/93 drought scheme in South Africa and SADC as identified by FAO.

The study on livestock farming coping strategy with drought, with emphasis on Namibian farmers, suggested the need for a national drought policy and strategy that addressed the issues of dependency on drought relief, rangeland degradation due to fodder subsidies, fraudulent claims for subsidies and the frequent, high and escalating costs to government of drought relief measures. The policy should also address the institutional arrangements, financing of drought relief, implementation of policy into practice, emergency stock water and drought reserves, impact of livestock marketing incentives, link between bush density and perennial grass mortality and how to accommodate rainfall variability in drought definition (Republic of Namibia, 1997; Sweet, 1998).

The Department of Agriculture, Water and Rural Development developed a national drought policy and strategy for Namibia for disaster reduction. The objectives of the national drought policy and strategy was to encourage and support farmers to adopt self-reliant approaches to drought risk, preserve adequate reproductive capacity in livestock herds in affected areas during drought periods, and minimize the degradation of the natural resource base during drought. Government provided assistance in the form of funds for mitigations activities and disaster when disaster occurred. Farmers should manage agricultural activities in an economical and ecologically responsible manner.

Constraints encountered during the implementation of drought relief were limited skilled human resources due to lack of staff on the established structures and limited financial and material resources. The Namibian Government wanted to strengthen the disaster preparedness through formulation of relevant policies, strategies and legislations and the resources mobilization mechanisms to address human, financial and material resources constraints (Bethune, 1999; Namibia, Emergency Management Unit, 2004).

3.3.3 Disaster drought relief scheme in Botswana

The study on integrated drought early warning systems in Botswana was focused on the increasing drought preparedness at national and local levels through Drought Early Warning Systems. The SWOT analysis was used to examine whether the Botswana Early Warning System

was a good practice or not. The design and the implementation of a drought relief programme at National Drought Planning included all spheres of the government and all sectors responsible. They had to share information on drought before the declaration of drought for better implementation of drought relief. The implementation relief scheme in Botswana at local level was effective because a preparedness plan was in place before the drought (Sear, Dambe & Slade, 1999).

The Ministry of Agriculture in Botswana wanted to reduce subsidies for stock feed during the drought by ensuring adequate and availability of stock feed throughout the country. The Ministry supported the programme of National Water Master Plan, National Conservation Strategies and the new Agricultural policy which phased out as many subsidies as possible and eliminated distortions on the producer prices of the stock feed during drought. It was not feasible to eliminate all subsidies, but to be managed through better targeting of subsidies (Botswana. Institute for Policy Development, 2001).

IFAD as agency responsible for funding disaster projects aimed at disaster risk reduction, funded Botswana arable lands developments because the country adopted drought risk management strategies. The project was targeting three groups of farmers, namely Model I, Model II and Model III. The projectôs objectives were to expand production through farm investment, seasonal inputs, strengthening of the extension, strengthening of credit services, strengthening of market inputs supply and distribution, project management and coordination and monitoring and evaluation. The implementation of DRP on ARAP achieved the food self-sufficiency on-farms, institutional strengthening, adoption of draught power, limited adoption of equipment, credit and stores and monitoring and evaluation.

Main issues and recommendations were target group classification; development and dissemination of appropriate technical packages, rural credit, access to land and water resources and complementary of project ï moving from grants to credit programme. Lessons learned from this study was the Botswana Government needed a policy shift from drought relief programmes towards the provision of implements and inputs through credit requirements, and the need for IFAD to support the shift in policy direction to reduce the costs of poverty alleviation and

improve food security at farm level (FAO, 2007; IFAD, 2004; IFAD, 2007; ISDR, UN Economics of Africa & UNDP, 2008).

The study on food security, agricultural policy and environmental interface: an African perspective the case of Botswana was conducted by Moepeng. According to Moepeng (s.a), Botswanaôs food security programme was successfully implemented, and it was discovered that peace, democracy and transparent participatory processes were critical for the success for these achievements.

3.3.4 Drought relief institutional arrangements in Southern Africa Development Communities (SADC)

The study on assessment of the drought impact and mitigation in the Limpopo River Basin which included Botswana, Mozambique, South Africa and Zimbabwe in 1999 emphasized a multi disciplinary approach that promoted drought mitigating technologies and practices, creating enabling policy environments and adequate planning. The main objectives were related to institutional arrangements, which were to build human capacity for designing and implementing drought policies and programmes, with regional support to national government, promote contingency planning for drought, promote technology development and transfer and strengthen management of resources (FAO, 1999; FAO, 2000; FAO, 2007; Rook, s.a.).

The limitations were lack of an unambiguous declaration of drought, lack of equity and efficiency in the distribution of the benefits. This led to a situation where a substantial proportion of drought relief funds found its way to non-deserving farmers and individuals. The farmers benefitted developed dependency syndrome on the government drought relief and recovery programmes. The institutional problems identified were poor integration of information into government structures and the focus on emergency response, rather than long-term planning (FAO, 2000).

The strategic objectives of Botswana stressed sustainable development to link populations, economy and its natural resources for present and future use. National Institutions for Botswana

related to drought management were placed under the Ministry of Agriculture which was responsible for the designing and the implementation of a National Master Plan for Arable Agriculture and Dairy Development. The implementation of livestock drought relief programmes maintained the breeding stock, where farmers were encouraged to sell their livestock during drought to maintain breeding and young animals. The feed supplements for energy, protein and minerals were sold to the farmers at 50% of the cost price during droughts.

Mozambique emphasized the role of planning and coordinating emergency prevention and response. The national structure underwent a tremendous change from 2001 floods, to include all role players, and that was done with support of foreign aid and advisors. Ferguson (2005) confirmed that when GTZ assisting Mozambique in reconstruction and rehabilitation of the country after drought and floods of 2000 in Buzi District, they incorporated disaster risk management as part of sustainable rural development. DRM in Buzi District was focused on an integrated, decentralized and multi-sectoral approach. Disaster prevention and mitigation disaster preparedness were integrated into the DRM.

South Africaôs disaster management approach aimed at creating an environment for effective disaster management. It also promoted proactive disaster management through risk reduction programmes, to improve the ability to manage disasters and their consequences and promote integrated and coordinated disaster management through partnership with stakeholder and cooperative relationships between government departments (FAO, 1999; FAO, 2000; FAO; 2007).

Zimbabweôs strategic objectives were to facilitate sustainable management of natural resources, ensuring correct stocking rates of domestic livestock and establishment of grazing schemes. SADC drought-related structures such as the SADC Food, Agriculture and Natural Resources Sector and SADC Drought Monitoring Centre were established to deal with food security and climate extreme.

SADC sub-region incorporated drought risk management strategies, implementing mitigation and prevention programmes of drought impact (FAO, 2006a; FAO, 2006b). Drought impact

mitigation and prevention in the Limpopo River Basin based drought and climate variability adopted a comprehensive cycle of a disaster management key to a drought management scheme.

3.3.5 South Africa's disaster drought relief scheme

The study of the South African response to drought since 1984 up to 1991/92 with Bophuthatswana Bantu as case study, was looking at the nature and implementation of agricultural drought relief policy in Bophuthatswana with reference to droughts of 1982 to 1985 and 1992 (Vogel & Drummond, 1993). Livestock farmers were heavily affected as they lost their livestock due to mortality. An Independent Drought Relief Agency was established to implement 1982 to 1986 drought relief schemes while in 1992 the Department of Agriculture took the decision to implement a drought relief scheme. The scheme implemented by an independent agency was praised by the Independent Drought Relief Agency and public. The scheme implemented by the Department of Agriculture failed due to poor communication between officials, agricultural extension officers and relief workers, corruption with the implementation of drought relief, and there were less emphasis on management and preparedness for drought.

The study suggested that South Africa should copy from Botswanaôs experience in managing to establish Early Warning Unit that included a multi-disciplinary team involving a Food Resource Department, Nutrition Division and Meteorological Division for timely response to drought impact, including drought relief scheme implementation (Vogel & Drummond, 1993).

The evaluation study on the implementation of the 1992 to 1993 drought relief scheme for livestock farmers and other disasters regarding the provision of disaster financial assistance for relief during occurrences of natural disasters was conducted in 1999 for the whole of South Africa. The study criticized the Conservation of Agricultural Resource Act for not providing incentives to protect natural resources and capacity to respond to the immediate relief and to the long-term recovery from drought impacts.

The study recommended the establishment of a new act to deal with all natural and manmade disasters that should emphasize prevention and mitigation strategies. The proposed new Act

supported risk management initiatives and proposal to future funding arrangements by national, provincial and local government arrangements (South Africa. Department of Provincial Affairs and Constitutional Development, 1999).

The evaluation study on the implementation of 2003/04 agricultural drought relief scheme in South Africa, where farmers were assisted with fodder for their livestock up to the maximum of 30 cattle was conducted (Van Niekerk & Roos, 2007). The scheme mainly targeted all small-scale and communal farmers, because difficulties joined management control of natural resources in those communal lands. The main challenge to communal farmers was the high costs of transport to collect fodder at a depot. Commercial farmers indicated their dissatisfaction with the limited amount of relief up 30 LUS per farmer, as each of them had hundreds of cattle, complaining that the scheme was targeting subsistence farmers. All farmers were complaining about the late approval drought relief scheme due to slow onset nature of drought as disaster (Van Niekerk & Roos, 2007).

The study on human response and adaptation to drought in the arid zone of Southern Africa was categorized into coping and adjustment with the mechanisms of evading and enduring. South Africaôs response to drought moved away from the racially divided and unjust policies related to resource allocation to include the communal farmers. The study suggested inclusion of climate change and need to build social and institutional capacity into the response mechanism of drought risk management (OôFarrell, Anderson, Milton & Dean, 2009).

Nerpo farmers in Vhembe District at their yearly meeting were urging the Department of Agriculture to review their implementation policy for drought relief scheme for communal farmers. The main issue raised by farmers was transport cost to collect fodder at the depots which became a burden for them (Phadu, 2009).

The reviewed study of drought policy in the arid zone of South Africa which includes the Northern Province was conducted in drought network news by Drought Monitoring and Information Centre (DMIC). The implementation of drought relief payments to stock farmers had been subjected to drought as disaster proportions, and the number of stock should not exceed

the official carrying capacity of the farm. The activities of the drought monitoring and information centre were drought assessment and remotely sensed drought assessment, detection and monitoring and drought risk management (Du Pisani, Van Themaat & Roux, 1995).

The implementation of a drought relief scheme for 1992/3 which cost the Department of Agriculture an amount of R3.8 billion was conducted. The limitations of the drought assistance scheme were that it was only targeted at the commercial farming sector, and excluded the communal farming sector. The distribution of the fodder was not equal to all, and that developed dependency syndrome in the farmers who benefited most from the drought relief fodder scheme.

The poor integration of information dissemination into government structures and the focus were only on emergency relief response. The scheme favoured those with better infrastructure than rural dwellers with bad roads. The farmers did not adhere to the conditions set as prerequisite for the drought relief scheme assistance such as having the correct stocking rate as compared to the carrying capacity of the farms.

Disaster assistance should be provided in an equitable, consistent and predictable manner without regard to economic circumstances, industry or geographic region. Disaster assistance must be provided in the form of technical and relief measures. All the drought relief agencies should co-ordinate their efforts to establish an accessible pool of knowledge and experience on drought relief. The study suggested the pro-active approach to drought disaster risk management which included early warning system, preparedness and mitigation measures to effective and efficient implementation of any disaster (FAO, 2000; Fuchs, s.a.). The holistic nature of disaster risk management should include assessment, awareness, reduction, response and recovery while keeping in mind sustainable development activities (Backeberg & Viljoen, 2003; UN/ISDR, WMO & Asian Disaster Reduction Centre, 2002; Van Zyl, 2006).

The analysis of the drought risk management policy of South Africa prior 1980s, during the 1980s and 1990s was conducted by Ceepa and Backenberg (2010). The period prior to the 1980s the government subsidized livestock farmers based on the assumption that 85% of the country under pasture land was in dry zones. In the 1980s the government introduced the assessment

procedures and eligibility criteria; the measures and the incentives to discourage overstocking and reduce the pressure on the natural based such as grazing and water resources (Ceepa & Backenberg, 2010).

The assessment process institutionalized drought management committees at national and district levels. Assistance provided were monitoring incentives for stock reductions and maintenance of nucleus herds through subsidies for farm lease outside drought declared areas and for fodder and transport costs. In the 1990s the policy adjustment incorporated self- reliance in the coping and adaption drought risk management strategies (Ceepa & Backenberg, 2010).

The farmers were encouraged to integrate drought risk management as part of regular farm management, planning and decision-making. The policy was shifted from the reactive approach to proactive approach. Disaster Management Act (South Africa. 2005) was passed, National Disaster Management Centre was established in 2006. The Agricultural Disaster Management Plan and Agricultural Drought Management Plan were drafted (Ceepa & Backenberg, 2010).

3.3.6 Comparative study of national drought policies of Australia, South Africa and United States

The comparative study on the national drought policies of Australia, South Africa and the United States indicated that the countries are extremely drought prone nations with a longstanding history of government intervention in the form of drought relief. The government intervention strategies of Australia, South Africa and the United States were reactive to crisis, and they proved unsuccessful. Australia was the first country to move towards a national drought policy that emphasized a more risk based management approach, minimizing the need for government during and in the post drought period (Wilhite, *et al.,* 2005; Knutson, Hays & Phillips, 1998).

South Africa and the United States each followed a similar course of action and were at various stages in the development of a national drought policy. The lessons learned in each country could be helpful to both developed and developing countries seeking a more proactive approach to drought management and improved level of drought preparedness (Wilhite *et al.,* 2005).

South African Drought policy did not force the relevant National Organ of State, Provincial Departments, Metropolitan districts and its municipalities to establish its permanent structures to deal with drought risk management. The Department of Agriculture in South Africa had permanent structures at National, some in certain provinces and none at district levels and municipalities. In the USA and Australia drought management was implemented according to the approved policy and adjustment if they released the gaps that needed to be addressed (Wilhite *et al.,* 2005).

3.3.7 Conclusion

In Australia, the implementation of a drought relief scheme for farmers adopted all disaster risk management elements such as preparedness, prediction and early warning, mitigation and prevention, disaster impact assessment response recovery, and reconstruction. The drought relief scheme in Australia was funded from relief loans which should be paid by the farmers when they realized profit in good years. Drought risk was incorporated into the total farm risk management and farmers should manage drought risk like any other risks that might cause his or her business to fail to produce.

In South Western Asia, India, Pakistan, MENA Region disaster risk management was moving away from a drought crisis management to a drought risk management approach. Good governance and disaster risk management approach with all elements was the key to all countriesô successes in implementing disaster relief schemes such Australia, Botswana, India and Kenya. The entitlement which referred to the correct identification of the beneficiaries was the key to the success of drought relief schemes in Australia, Kenya, India and Botswana.

The drought relief schemes implemented by national relief agencies and NGOs were more transparent and inclusive when implementing drought relief schemes and they were supported by development banks internationally (Botswana by IFAD and DFID). The schemes implemented by government agencies responded late to drought impacts. The main problems led to the failure of implementation of drought relief schemes where the establishment of institutional

arrangement, capacity to implement information and communication management systems. Chapter 4 explains how the research was designed and the methodology used to implement the process until the fodder reached the farm.

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

In order to assess the livestock fodder drought relief scheme implemented according to the predetermined criteria two questionnaires were designed to collect data from farmers and officials who participated in the implementation of the processes of the fodder drought relief scheme. The processes of the fodder drought relief scheme started from the registration of beneficiaries at service centres, data capturing and request for fodder from provincial office, the receipt of fodder at various depots, the selling of fodder to farmers to the distribution of fodder to farmers. Relevant documents were observed to support data collected through interviews and the results were summarized below.

This chapter summarizes the results of the research. It commences with the summaries of farmers and officials interviewed, registration processes and records, fodder delivery and distribution of fodder at depots for 2007/8. Other aspects covered are transport to collect fodder from depot to the farmerôs home, challenges faced by officials during the implementation of the scheme, information dissemination and channels of communication during the process of the drought relief scheme implementation. The strategies used by farmers to reduce loss of their cattle during drought are investigated and lastly recommendations for improvement made by farmers and officials.

4.2 Summaries of farmers and officials interviewed

Figure 4.1 illustrates the responses received from male and female officials and farmers. Sixty-seven per cent of the 249 respondents were males and 33% were females. Seventy-four per cent of the 35 respondents were males and 26% were females. Officials interviewed were those providing and assisting farmers with application forms for fodder at service centre offices, and those selling and distributing fodder to farmersô municipal offices.

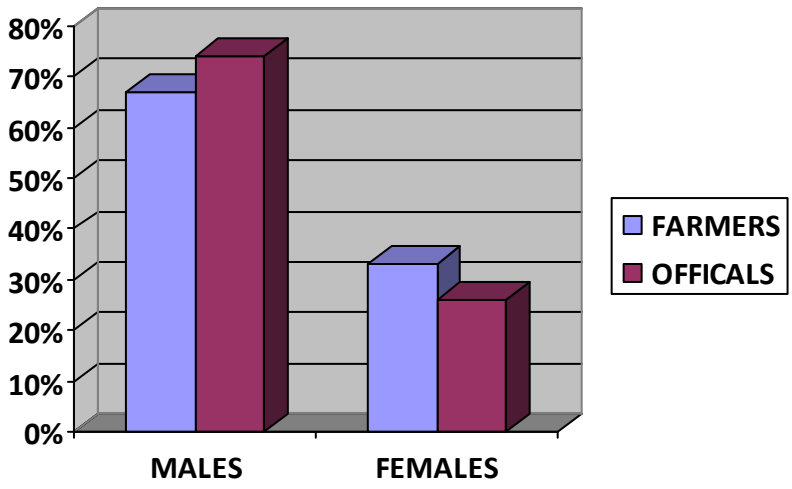

Figure 4.1: Farmers and officials' responses grouped by gender

The results indicated the traditional role of the man as head of the household. Most females looked after their livestock while husband were at work and they were more vulnerable to drought than men. The role of a female was limited to ownership of livestock only when the man, as head of the family, was deceased or she was the head of the family. Most information dissemination was through meetings at tribal and agricultural offices and was mostly attended by men as females were doing domestic work it is clear from Figure. 4.1 that there was less representation of female officials indicating that fewer females were employed in the sector than men. The department should consider gender equity in employment so that in drought disaster risk management they should incorporate the views of women.

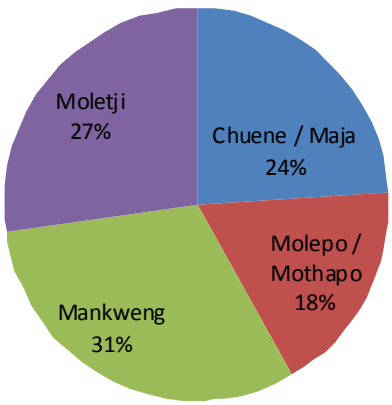

Figure 4.2: Farmers' responses were grouped into service centres

Thirty-one per cent (31%) of the 249 farmers interviewed were from Mankweng service centre, 27% from Moletji service centre, 24% from Chuene/Maja service centre and 18% were from Molepo/Mothapo service centre. Most farmers (30%) interviewed were from Mankweng service centre.

Farmers were randomly selected according to service centres to ensure fair representation of farmersô views across Polokwane municipality.

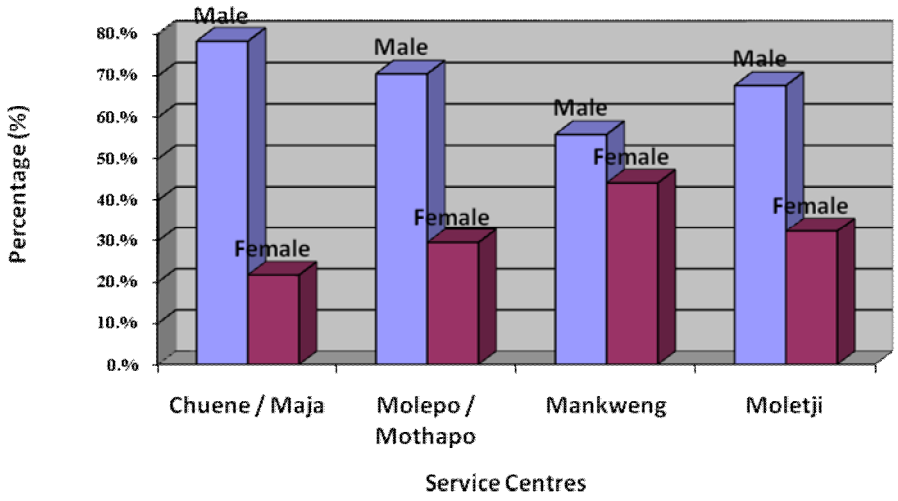

Figure 4.3: Farmers' responses according to service centres and gender

Figure 4.4 indicated that 78% of the 60 farmers interviewed from Chuene/Maja service centre were males and 22% were females. Molepo/Mothapo service centre had a balanced number of farmers interviewed based on gender, namely 56% males versus 44% female farmers. Seventy percent of the farmers interviewed in Molepo/Mothapo service centre were males and 30% were females. Seventy-eight per cent of the farmers interviewed at Chuene/Maja service centre were males and 22% were females.

Women as main role players in the drought risk management were ignored and they were only included when men as heads of households were not present as a result of death or working situations.

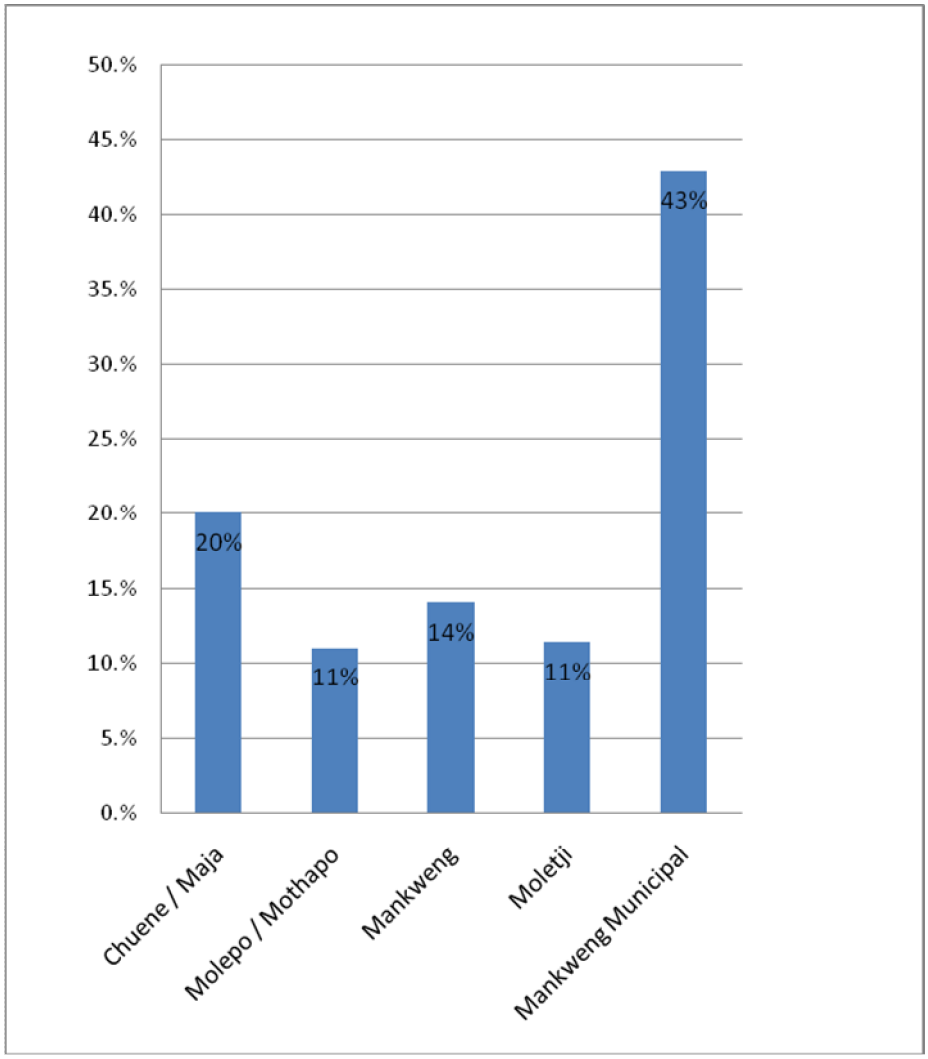

Figure 4.4: Response from officials according to service centres and Polokwane Municipality.

According to Figure 4.4, most officials interviewed were from the municipality offices (43%) where the purchases and distribution of fodder took place. They were responsible for the requisition, the receiving, the allocation, the selling and distribution of fodder during the implementation of the fodder drought relief scheme.

Twenty per cent of the officials who responded were from Chuene/Maja service centres, 14% from Mankweng service centre and 11% each from Molepo/Mothapo and Moletji service centres. Their main roles were to inform farmers about the scheme and assisted them to form for application at local levels.

TABLE 4.1: FARMERS' EDUCATION LEVEL

Educational level	Percentage	Cumulative Percentage
Never Attended School	9%	9%
Primary school	64%	73%
Senior Certificate	27%	100%
College	0%	0%
University	0%	0%
Grand Total	(249) 100%	(249) 100%

Table 4.2 indicates that 64% of respondents had primary education. Seventy-three per cent of the farmers interviewed were those who never attended and had primary education while only 27% of them had a senior certificate.

A farmerôs level of education determines the capacity of the farmer to reduce vulnerability in terms of filling out application forms, accessing information and understanding the implementation of the scheme. Education level has an influence on improving the capability of farmers or reducing the vulnerability of farming communities. Most of the early warning information is written in English as medium and needs to be translated into the local language before being interpreted to the farmers.

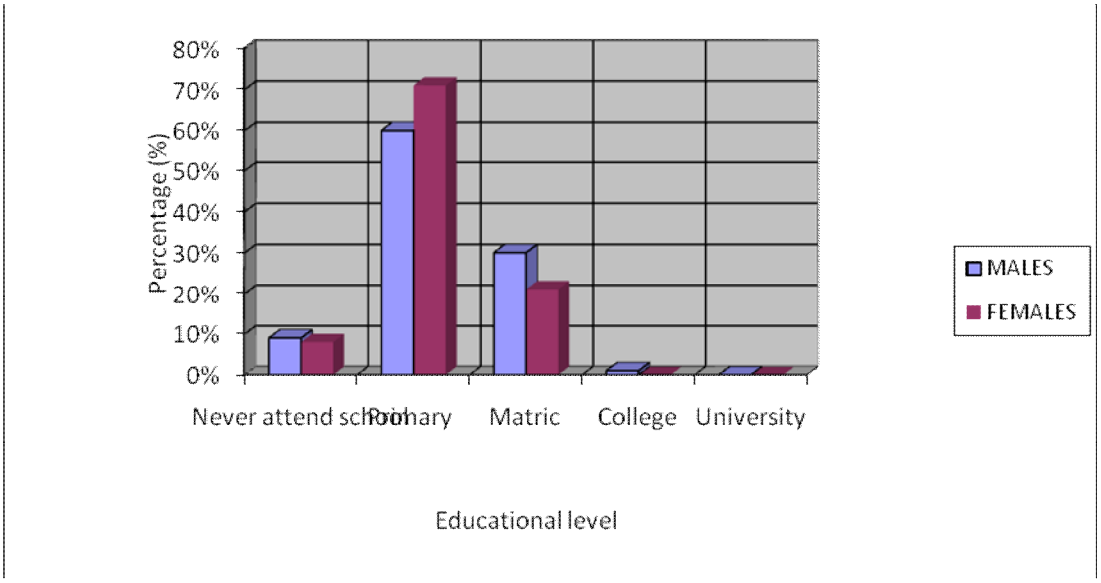

Figure 4.5: Gender and educational level of farmers interviewed

Figure 4.6 clearly indicates the distribution of education of the different sexes was almost the same for never having attended school, primary school education and obtaining a senior certificate. Less than 10% never attended, more than 60% had a primary education while 21% of the female farmers and 31% of the male farmers had senior certificates.

The results indicated that the level of capacity and capability of the communities to understand disaster risk management was low for most of them obtained a primary education irrespective of gender differences. The sex difference did not play an important role in influencing the level of education.

4.3 Registration Processes

It is part of data collection and capturing system for all key performance areas of integrated disaster drought management. Data from the collected and captured from drought vulnerability assessment such departments and communities affected drought impacts form part advisory forums for disaster drought risk management planning and response management planning.

TABLE 4.2: OFFICIALS REGISTERED FARMERS FOR DROUGHT RELIEF BENEFITS

Responses	Farmers	Officials
YES	99%	80%
NO	1%	20%
Grand Total	(249)100%	(35)100%

Ninety-nine per cent of the farmers interviewed were registered to participate in the drought relief scheme for fodder while one per cent of farmers who registered resorted to migrating their livestock to places where there was enough pasture for the animals. The farmers were not part of the disaster risk management planning and response management. Information dissemination and communication system was poor in Polokwane Municipality.

Eighty per cent of the officials were registered farmers and the registration was done before, during and after the delivery of fodder at the depot, while 20% of officials were responsible for selling and distribution of fodder to farmers. The municipal officials were not part of the multi

disciplinary team that advised disaster risk advisory forums during drought preparedness planning.

The officials who were not responsible for registering farmers should form part of the technical advisory team and drought disaster advisory forums. They could monitor the quality of the data collection and capturing system for disaster drought relief scheme planning and implementation. There were no formal structures to deal with drought risk management at district municipality and local municipality levels.

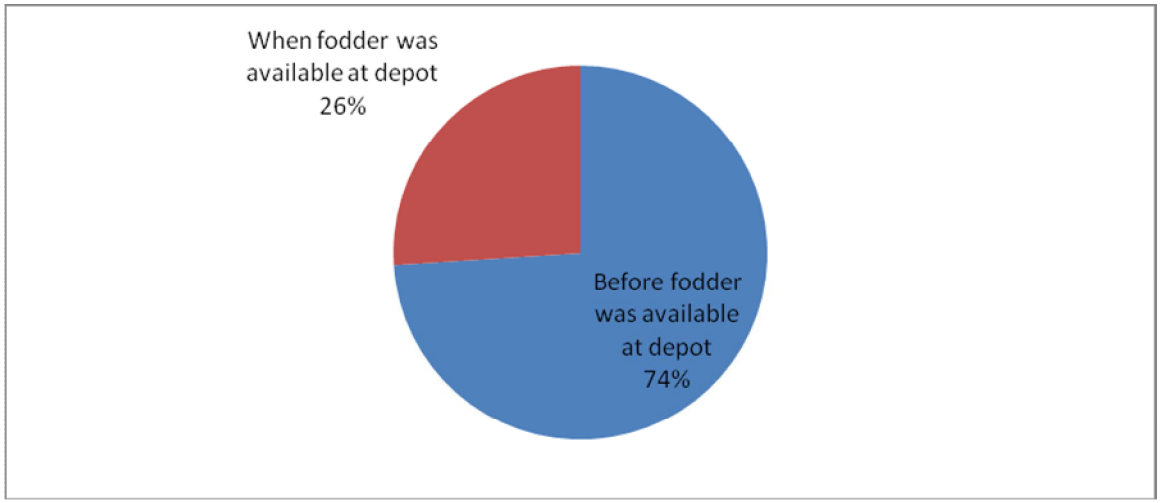

Figure 4.6: Farmers' registration period

Seventy-four per cent of the farmers registered before fodder was delivered at their depot while 26% of the respondents registered when fodder was delivered at the depot. Hundred per cent of the officials responsible for registration of the farmers, did it when the Limpopo Provincial Department of Agriculture had procured a certain quantity of fodder for the farmers.

The registration processes were done when the request for fodder was made, and did not guide the amount of fodder to the farmers as required. The provincial department officials estimated the amount of the fodder needed without consulting both municipal and local service centres, officials and farmers. The districts, municipalities and service centres did not have permanent structures and staff responsible for the implementation of drought risk management.

The provincial structure requested only the districts, municipalities and service centres to assist during implementation of drought disasters relief schemes. Both farmers and officials from the districts and municipalities were not part of the stakeholderôs drought risk management, not capacitated in the drought risk management processes and activities. This contributed to the limited number of stock fodder delivered at the depots as the resource audit was not properly done.

4.4 Registration records

Registration records are part of the integrated disaster drought management database management system of all the key performance areas including the drought relief response mechanism. The department of agricultureôs technical staff is responsible for managing drought response database management. This includes policy documents, standards and guidelines; resource databases such as stakeholders in the disaster response mechanism.

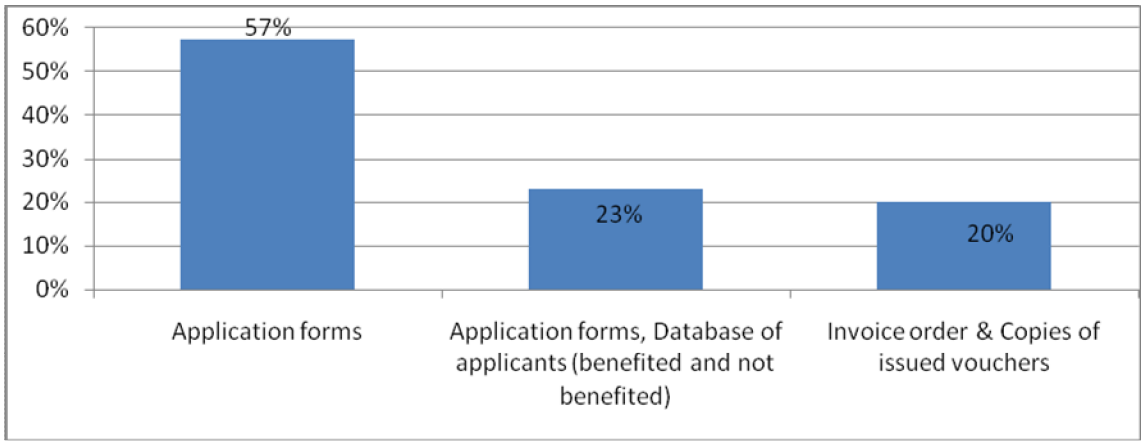

Figure 4.7: Records for implementation of drought relief scheme

According to Figure 4.8, 57% of the respondents were officials assisting farmers to fill out the application forms for fodder at service centres, and submitted the hard copies to the municipality office for being processed. Twenty-three per cent of the respondents processed the application forms for fodder from the service centres into the database of applicants and submitted electronic copies to the district and provincial offices to request fodder, and also submitted the database of

farmers who benefited from the scheme after the implementation of the drought fodder relief scheme.

Twenty percent (20%) of the respondents were selling fodder to farmers and keeping records of fodder received. They issued vouchers to all farmers who benefitted from the implementation of the drought fodder relief scheme.

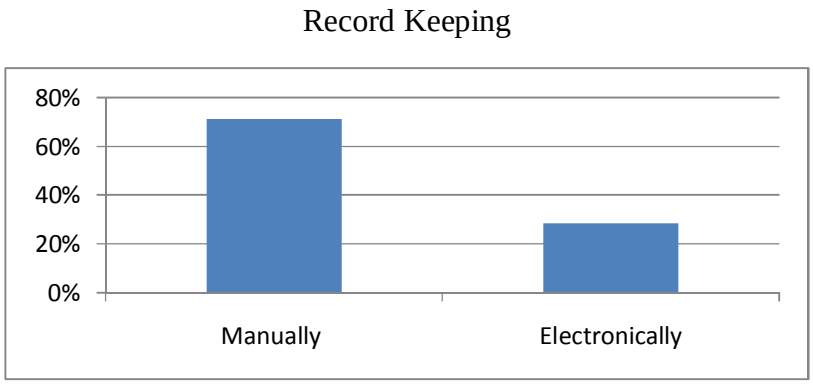

Figure 4.8: Record keeping of farmers' registration during fodder scheme implementation

Seventy-one per cent of the drought relief implementation scheme records were kept manually by service centre officials. Officials assisted farmers to fill out application forms and forwarded the applications to municipal offices where the purchases and collections of fodder took place. Twenty-nine per cent of the drought relief implementation scheme records kept had electronic files containing records of farmers who applied for fodder.

The result indicated that drought management information had improved and needed to be improved through integrated drought information management whereby information for drought institutional arrangements, drought assessment, drought impact assessment and drought response and mitigation were electronically and manually done for safety and in emergency situations.

TABLE 4.3: FARMERS AND THEIR LIVESTOCK APPLIED FOR 2007/8 PER SERVICE CENTRES

Service Centre	Total farmers	Total Number of cattle				
		Cattle	Calves	Sheep / goats	Total LSU	Probability
Chuene / Maja	242	2293	507	745	2502	28%
Molepo / Mothapo	115	1345	423	675	1528	17%
Mankweng	425	3787	753	2240	4286	47%
Moletji	93	708	211	167	771	9%
Grand Total	875	8133	1894	3827	9087	100%

Table 4.3 indicates the total number of cattle, calves and small stock (sheep and/or goats) per service centre before conversion and the total number of LSU after conversion, using a conversion table. This database of livestock farmers and livestock numbers that applied to participate in the fodder drought relief scheme was developed when conducting drought impact assessment at Polokwane municipality.

Figure 4.9 indicates that 48% of the livestock registered for fodder were from Mankweng; 28% of them were from Chuene/Maja; 17% were from Molepo/Mothapo; and 9% was from Moletji Service Centres.

The results indicated that more livestock from Mankweng service centre were in need of fodder. The applications were not useful to the request for fodder as they were done when the request had already been placed on an ad hoc basis. Livestock numbers should be part of
resource base variables as an element of preparedness planning, whereby both district and municipalities and their role players should be part of the multi-stakeholders and multi-disciplinary team.

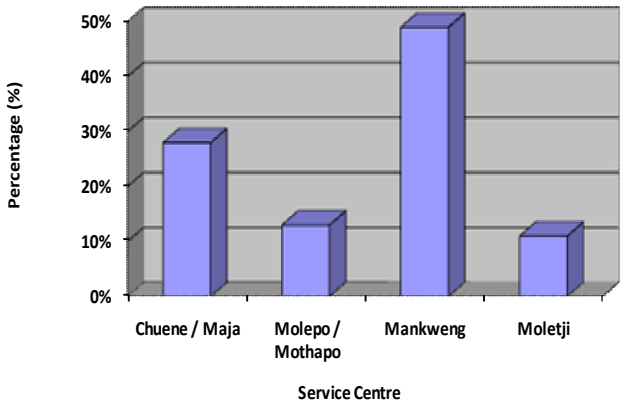

Figure 4.9: Farmers registered for 2007/8 according to service centres

Forty-nine per cent of the farmers registered for fodder were from Mankweng, 28% were from Chuene/Maja, 13% were from Molepo/Mothapo and 11% were from Moletji Service Centres.

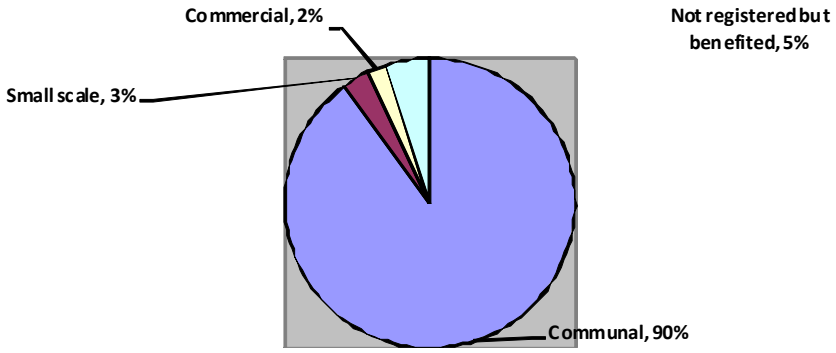

Figure 4.10: Registered livestock farmers according to farming operations

Ninety per cent of the farmers registered were communal farmers and they qualified to participate in the drought relief scheme in terms of the National Department of Agriculture drought relief scheme framework as seen in Figure 4.10.

The remaining were 3% of the small-scale farmers, 2% of commercial farmers while 5% were the ghost farmers who had not properly registered. In terms of the National Department of Agriculture drought relief scheme framework both small-scale and commercial farmers should not form part of the fodder drought relief scheme delivered at the departmental depots. They should be allowed to apply and buy fodder directly from the approved supplier, and to submit the proof of the purchased fodder to the department. The department would pay the subsidy amount directly to the supplier.

Five per cent of the farmers were not properly registered and had to be disproved due incomplete information on the database and/or no application forms available. They were not supposed to benefit from the drought relief scheme.

Farmers affected should be part of the vulnerability risk assessment conducted during drought monitoring and impact assessment to guide the authorities on how to assist farmers and to what extent the assistance should be. If it was done when the scheme had already been planned it was difficult for implementers to meet the demand for targeted the beneficiaries.

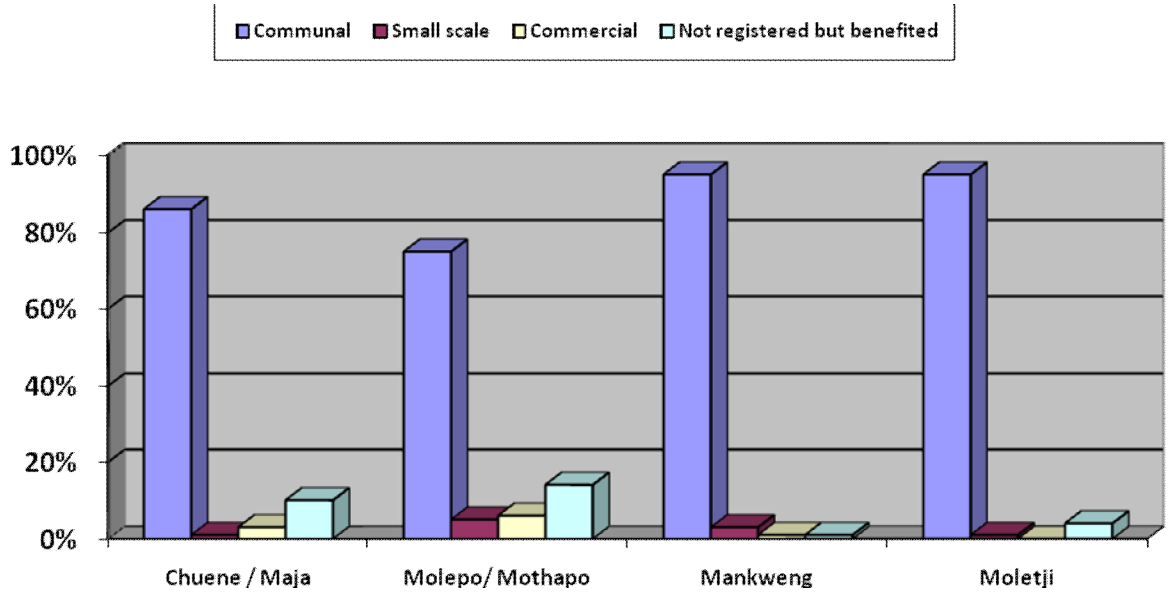

Figure 4.11: Registered livestock farmers according to farming operations and service centres

Eighty-six percent of the farmers from Chuene/Maja were communal farmers, one per cent of them were small-scale and three percent commercial farmers. The last ten per cent from Chuen/Maja Service Centre who benefited from the drought relief scheme were farmers not properly registered, but who benefited from the scheme as seen in Figure 4.11.

The disaster management practitioners and general public were not involved in the planning of disaster drought response mechanism. Both farmers and officials at local municipality and service centres were not capacitated in data collection and capturing information on all key performance areas. They were not equipped as enablers of disaster risk management and integrated disaster database and information management.

4.5 Dissemination and communication channels during drought relief scheme

Information dissemination and channels of communication are key enablers for disaster drought risk management. Documents for drought risk management for institutional capacity arrangements, risk assessment, risk reduction, response and recovery should be properly managed and communicated.

The means of dissemination of information needs structures and integrated disaster drought database and information management. The department of agriculture depended on technical staff to disseminate disaster drought information to and from livestock farmers. Figure 4.12 indicates the summary of the technical staff disseminating the drought risk management information.

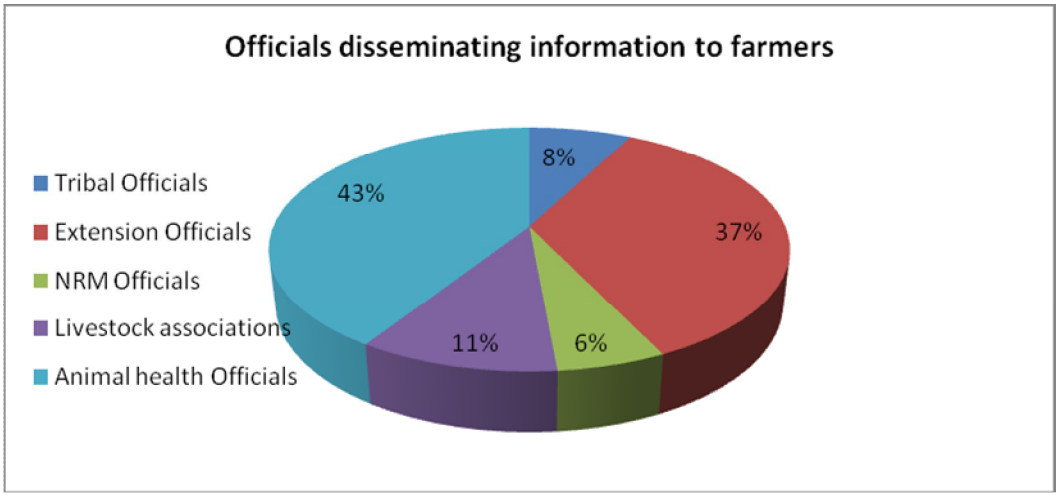

Figure 4.12: Officials informing farmers of drought relief scheme

As seen in Figure 4.12, 43% of the farmers were informed to participate in the fodder scheme by animal health officers, 37% by extension officials, 11% by livestock farmers associations, 8% by tribal offices and lastly six per cent of NRM officials assisted in the dissemination of information.

The results indicated that animal health officials were closer to the livestock farmers due to the implementation of animal health livestock programmes throughout the year. The other technical staff did less to inform farmers to participate in the drought risk management. The temporary nature of assignment of the responsibility and lack of training were the main contributing factors for failing to deliver the message to the farmers. The farmers association was limited to certain service centres, and if capacitated it should improve the participation of farmers in disaster risk management. Technical staff was further analyzed per service centre to find out who played the role of the dissemination of drought risk management information and the results are indicated in Figure 4.13.

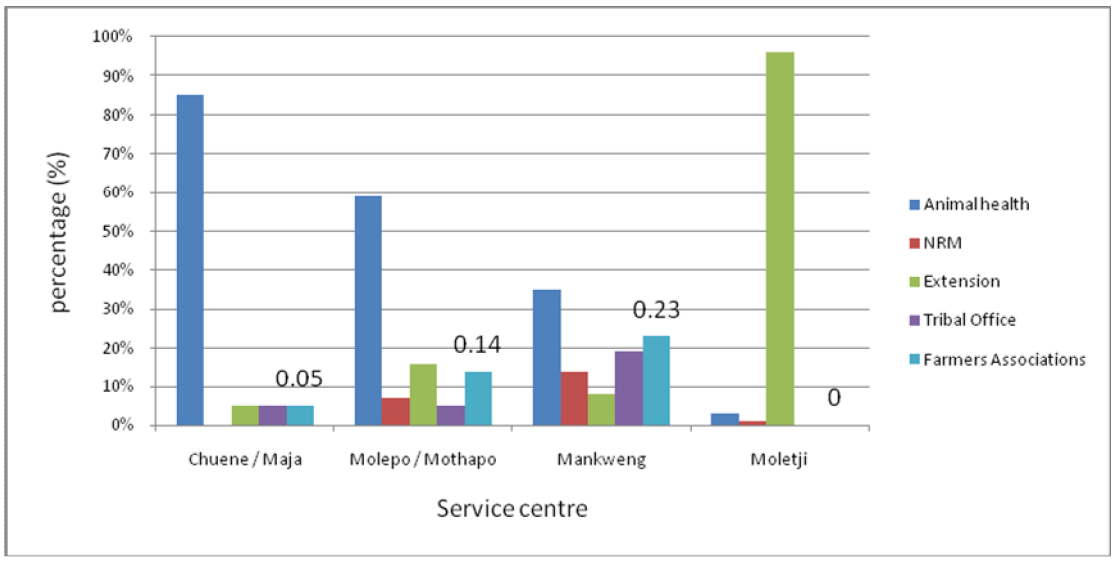

Figure 4.13: Service centres for registration for drought relief scheme

In Moletji, 96% of the farmers were informed by extension officials about the registration to participate in the drought relief programme. In Chuene / Maja Service Centre, 85% of farmers were informed by animal health officers and five per cent were informed by extension, tribal and farmers associations. In Molepo/Mothapo, 59% of the farmers were informed by animal health officers and in Mankweng 35% of the farmers were informed by animal health officials.

Figures 4.12 and 4.13 indicated that some individuals within different service centres carried more responsibility to disseminate disaster risk management information than others. For example in Chuene / Maja, an animal health officer took the lead in dissemination of drought risk management information, while in Moletji, an extension officer played the key role.

The channels of communication played the key role in the dissemination of disaster drought risk management information. They differ from place to place depending on the type of technological infrastructure available and capability of stakeholders to use those channels. Communication between farmers and technical staff needs officials to have up to date disaster risk management information and the suitable channel to communicate. The channels available to farmers are illustrated in Figure 4.16.

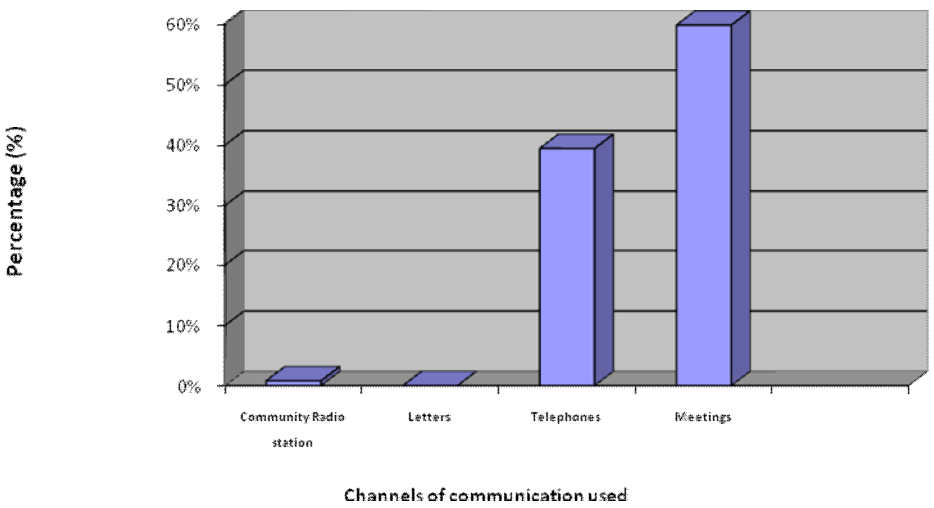

Figure 4.14: Main channels of information about drought relief scheme

Figure 4.14 indicates that 59% of farmers said meetings were the best communication tool to be used and 39% of those farmers preferred telephones. The telephone infrastructure was the main challenge in some service centres. The access to telephones and faxes was the main challenge for technical staff to get disaster information to be disseminated to farmers.

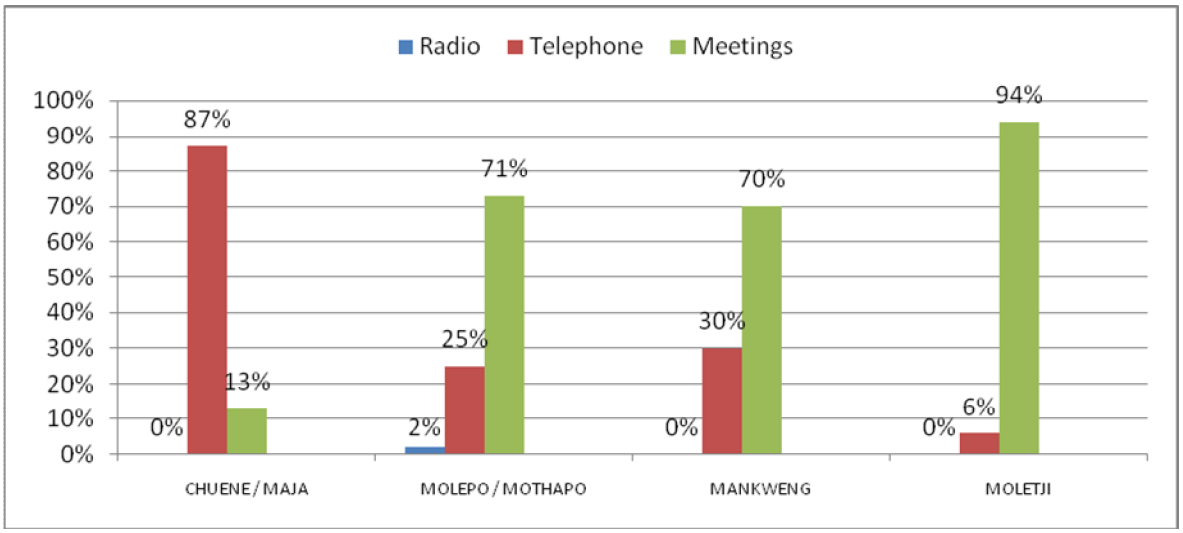

Figure 4.15: Main communication channels used by service centres.

Figure 4.15 shows that 87% of the farmers from Chuene /Maja preferred telephones and 13% preferred to be informed through meetings. Seventy-one per cent of the farmers from Molepo / Mothapo preferred meetings, 25% preferred to be informed by telephone, while 2% of them

preferred to be informed by farmers associations and radio. Sixty-nine per cent of the farmers from Mankweng preferred meetings, 30% of them preferred telephones. Ninety-four per cent of the farmers from Moletji preferred meetings and 6% of them preferred telephones.

The registration of farmers is part of the integrated disaster drought database and information management. This process needs information on risk assessment, risk reduction and response to drought disseminated to all institutional structures impacted by lead institutional structure. The department of agriculture as lead agency coordinated all activities of drought risk management, and its staff were responsible for the dissemination of drought risk management information to farmers.

Information dissemination is part of the integrated disaster management database and information management. The disaster management stakeholders and media are responsible for managing documents, resources, database, including community knowledge in disaster risk management, controlling the quality of information through monitoring and evaluation.

Disaster management practitioners, general public and communities need training, education, public awareness and research on information dissemination and communication systems. Public awareness should be done through campaigns and participation.

TABLE 4.4: RECEIVAL AND DISSEMINATION OF INFORMATION AND MONTHLY ADVISORY

	Farmers & EWS (Receiving)	Officials & EWS (Dissemination)
YES	17%	80.0%
NO	83%	20.0%
Grand Total	(249)100%	(35)100%

Eighty per cent of the 35 officials interviewed indicated that they were responsible to disseminate EWS to farmers, but they received outdated information as indicated on Table 4.4. Eighty-three per cent of farmers interviewed said they did not receive Early Warning Information and monthly advisory about drought, and 17% said they received the information.

Both the officials and farmers agreed about receiving drought risk management information very late from the provincial office due channels of communication. Officials received out dated information and disseminated it to the farmers. The province preferred to send EWS through emails to districts and municipal managers who had access to internet through 3G cards. The district and municipality had temporary structures to deal with disaster crisis management practices. The implementers of EWS were not trained in any key performance area of disaster risk management.

A good example of receiving late information was the dissemination of information about the availability of fodder at Syferkuil depot. When the farmers arrived at the depot from far places such as Chuene, Maja and Moletji, the fodder had already been sold to nearby farmers who bought and organized transport locally.

In Figure 4.16 it is clear that 83% of the farmers from Chuene /Maja received early warning information and monthly advisory on drought, 17% said they did not receive information. Forty-eight per cent of the farmers from Molepo/Mothapo said they received early warning information and the monthly advisory on drought while 52% said they did not receive the information.

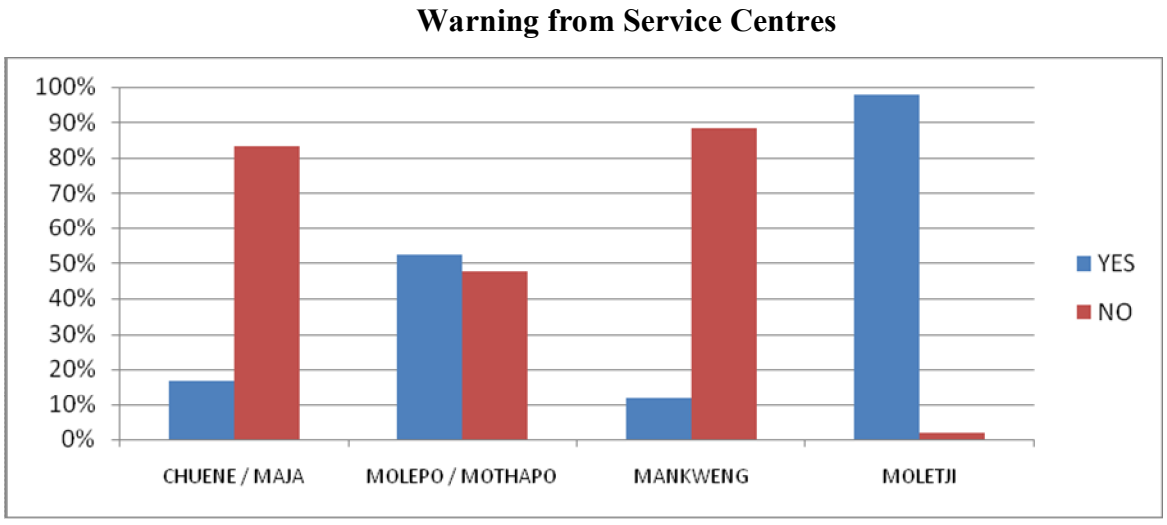

Figure 4.16: Early warning information and monthly advisory according to service centres

Eighty-eight per cent of the farmers from Mankweng said they received Early Warning Information and monthly advisory on drought and 12% said they did not receive information.

Ninety-eight percent of the farmers from Moletji said they received Early Warning Information warning and monthly advisory on drought and 2% said they did not receive information.

Farmers at Mankweng and Chuene/Maja Service Centres were the more than 80% vulnerability to the receive information on the fodder drought risk management each. Disaster management practitioners such farmers and agricultural technicians should take part the EWS, preparedness planning and implementation in all phase of disaster management cycle.

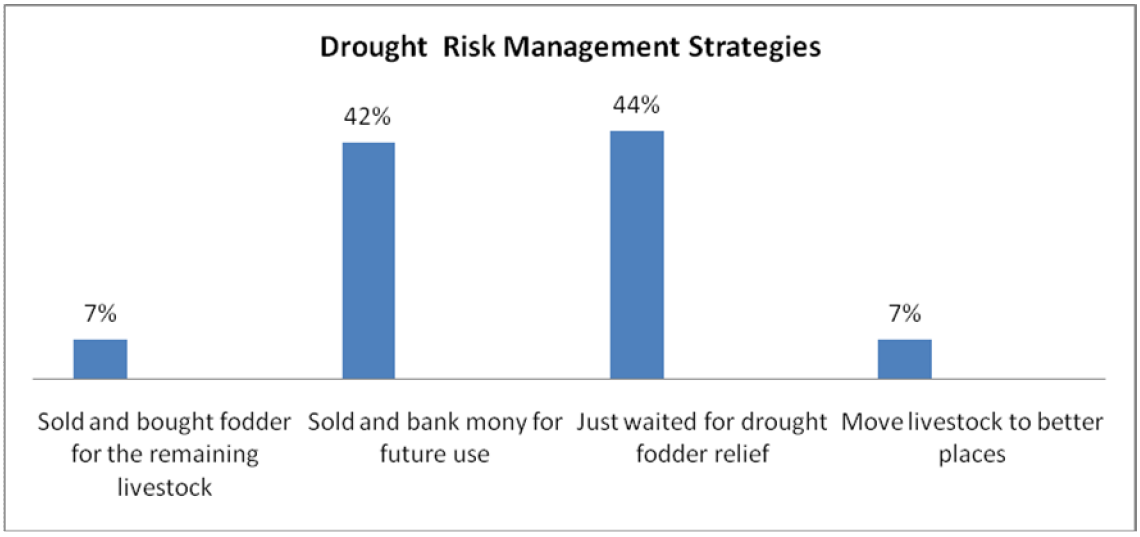

Figure 4.17: Disaster Risk reductions strategies during drought

Forty-two per cent of the farmers interviewed, as in Figure 4.17, sold part of their livestock and put money aside for future use; 44% of them just waited for drought fodder, while seven per cent of them moved animals to better places when experiencing serious drought. Seven per cent of them sold to others and bought fodder for the remaining cattle. You could have used terms like destocking to be more technical.

Drought risk reduction refers to the development and implementation of the integrated drought risk and response management plans. The disaster risk management planning for the municipal organ of the state such as department agriculture should include municipal entities, wards and local communities during the integrated development plans and response management.

The results in Figure 4.18 indicated that almost half (49%) of the farmers understood the drought risk reduction strategies, but 51% needed to be capacitated on them. In reality farmers were very isolated and they did not even understand the carrying capacity of their lands. Most farmers with money had more livestock than the carrying capacity of their grazing land.

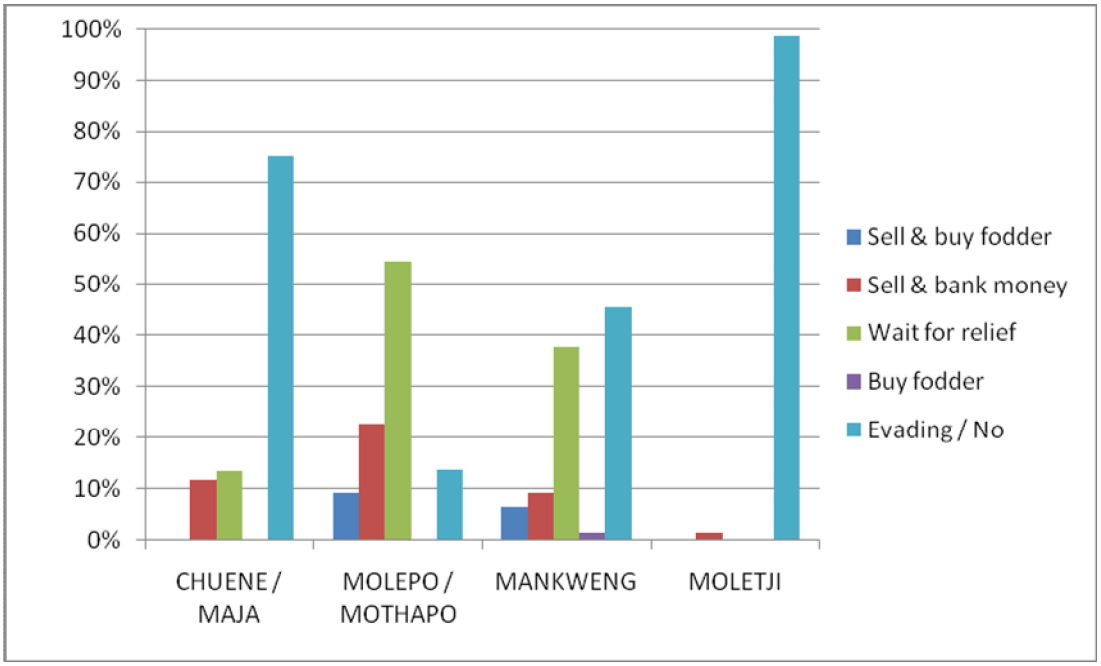

Figure 4.18: Disaster Risk reductions strategies according to service centres

Seventy-five per cent of the farmers from Chuene/Maja Service Centre stated that they moved their livestock to better places when experiencing drought, 12% sold part of their livestock to others and put money away for future use, while 13% of them waited for drought fodder. Fifty-five per cent of the farmers from Molepo/Mothapo service centre waited for drought fodder, 23% of them sold part of their livestock to others and banked money for the future, 14% of them moved their animals to better places (no serious drought) and 9% of them sold to others and bought fodder for the remaining cattle.

Forty-six percent of the farmers from Mankweng service centre responded by moving their livestock to a better place when experiencing drought, 38% of them just waited for drought fodder, and 9% sold part of their livestock to others and put money away for future use. Ninety-

eight per cent of the farmers from Moletji service centre responded by moving their livestock to a better place when experiencing drought and two per cent sold part of their livestock to others for future use.

Disaster risk management strategies should include knowledge of local community on how to reduce drought risk in the community. Both farmers and communities should be capacitated through training, education, public awareness and research programmes. They might be facilitators and service providers in any of the key performance areas of integrated disaster risk management.

4.6 Fodder delivery and distribution at depots for 2007/8

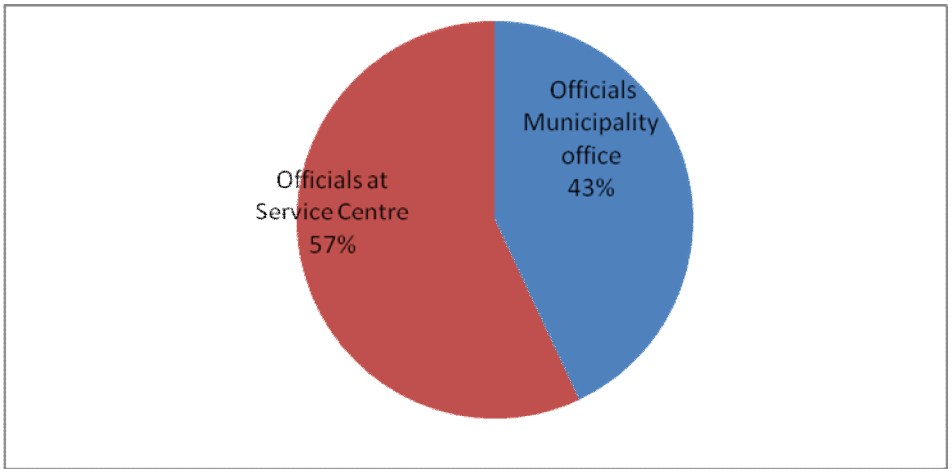

Figure 4.19: Implementation of drought relief scheme by officials

Figure 4.19 indicates that fifty-seven per cent of the 28 officials interviewed were responsible for assisting farmers to fill out forms and were stationed at service centres. They were technicians who assisted farmers with the implementation of drought risk management. Their activities involved data collection and capturing for drought risk response activities such as dissemination of early warnings, disaster assessment and drought response.

Forty-three per cent of other officials were administrators who took decisions on the allocation of fodder. Their activities were quality control, monitoring and evaluation and management of the integrated disaster management database of drought risk reduction activities such as dissemination of early warnings, disaster assessment, drought response and relief measures.

All officials should form a part of the multi-disciplinary team, participate and be capacitated in the integrated contingency and operational planning drought response mechanism.

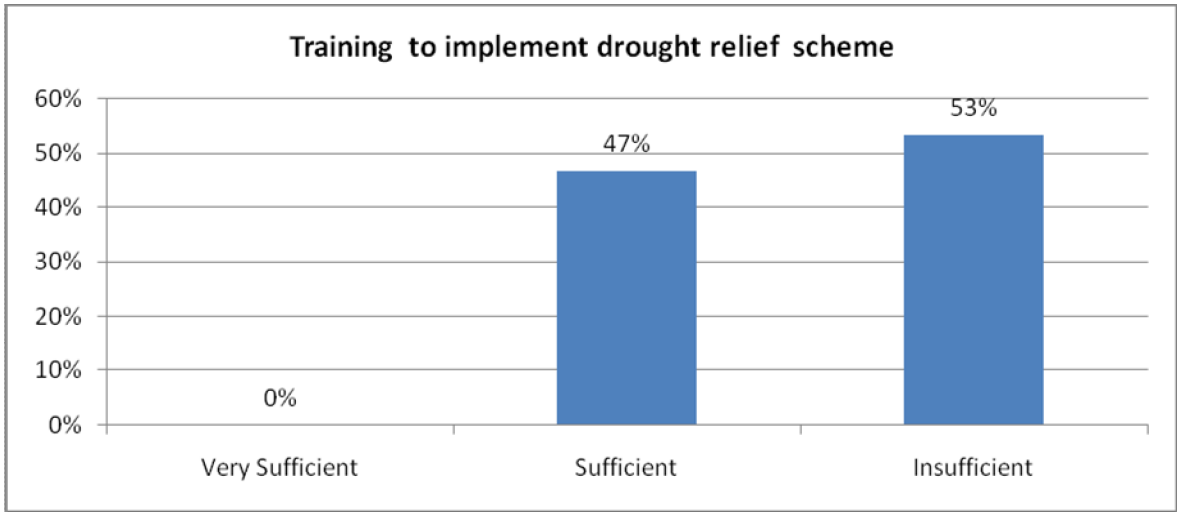

Figure 4.20: Training of officials on implementation of drought relief scheme

Figures 4.20 indicates that fifty-three per cent of 28 of the officials did not receive proper training on the implementation of the drought relief scheme. They were technical staff who allocated fodder to the livestock farmers and they should master the implementation process of the scheme. Forty-seven per cent of 28 of the officials who received training for implementation of drought relief scheme were administration officials who sold fodder and issued receipts to farmers.

The payments of fodder were done at State Vet and Mankweng Agricultural Office. Ninety-eight per cent of the farmers bought fodder at Mankweng Agricultural Office. The payment of fodder at the State Vet office was closed due to poor management of fodder sales. Seventy- one

per cent of the fodder was delivered and collected at Syferkuil, while 29% of the fodder was delivered to each of the Maja and the Moletji depots.

TABLE 4.5: DISTRIBUTION OF FODDER BY OFFICIALS

	40 KG Bags of Meals / pullets	Allocation criteria (Bags / farmers or LUS)	Farmers benefited
December 2008	1500	No limits	56
February 2009	750	50 bags maximum	18
August 2009	500	10 bags maximum	48
November 2009	750	10 bags maximum	75

Table 4.6 shows how the farmers benefited from the fodder distributed by three depots. The first delivery in December 2008 was 1 500 bags. The allocation of the bags of fodder per farmers had no limits and only 56 farmers benefited from 1 500 bags delivered at three depots. One farmer bought 400 bags of pullets from a Moletji depot and received 500 bags.

The second delivery of 7 500 bags of fodder was only at Syferkuil depot. The maximum allocation of fodder per farmer was limited to 50 bags and only 18 farmers benefited from the scheme. The third delivery of 500 bags of fodder was also at Syferkuil.

The maximum allocation of fodder a farmer could buy was limited to ten bags and only 48 farmers benefited from the scheme. The fourth delivery of 750 bags of fodder was also at Syferkuil. The maximum fodder the farmer could buy was limited to ten bags and only 75 farmers benefited from the scheme.

By looking at the distribution of fodder, it indicated the late delivery of fodder when most areas were in the recovery phase, and most farmers had already lost their livestock due to drought. The first delivery was in November when the municipality had already received rains and grazing was in the recovery phase. The scheme implementation was late when the farmers lost their breeding livestock and did not meet its main objective of maintaining the breeding stock of the farmers impacted by drought.

Figure 4.23 indicates unequal distributions of fodder among the farmers who applied to participate in the fodder drought relief scheme for 1997/98. This indicated lack of standing point when taking decisions on quantity of fodder to be allocated to each farmer.

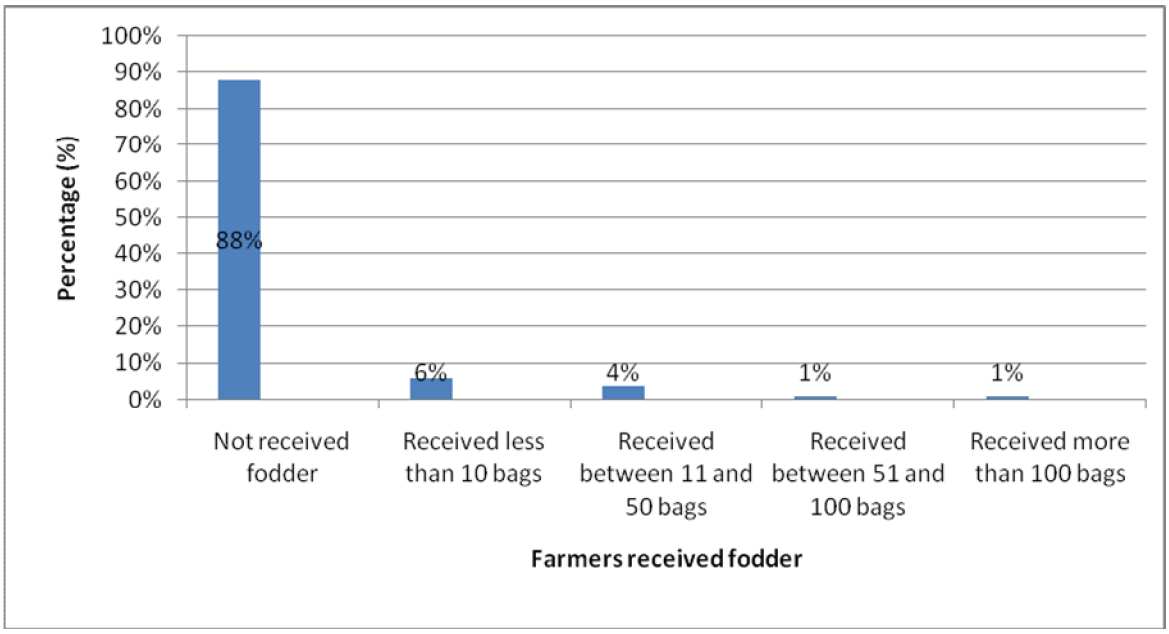

Figure 4.21: Fodder distribution among farmers on record

Figure 4.21 indicates the probability distribution of fodder during the implementation of the drought relief scheme. Eighty-eight per cent of the farming communities did not receive any fodder from the scheme while six per cent of them received fewer than ten bags per farmer. Four per cent of them received fodder between 10 and 50 bags per farmers while one per cent each received fodder ranging between 50 and l00 bags and more per farmer.

The allocation of fodder to farmers was done on an *ad hoc* basis whereby officials took decisions based on the risk of the damage caused by rats at the storage and perception that more fodder would be made available if farmers finished the fodder delivered. The quantity delivered was not enough for all farmers who applied to participate in the scheme, for example 500 bags versus 845 farmers. Both farmers and officials were not happy about the quantity allocated and the manner in which it was distributed to the municipality and its depots. The farmers and officials at

service centres wanted equal shares for fodder per service centre so that each centre would share fodder according to the number of farmers and livestock.

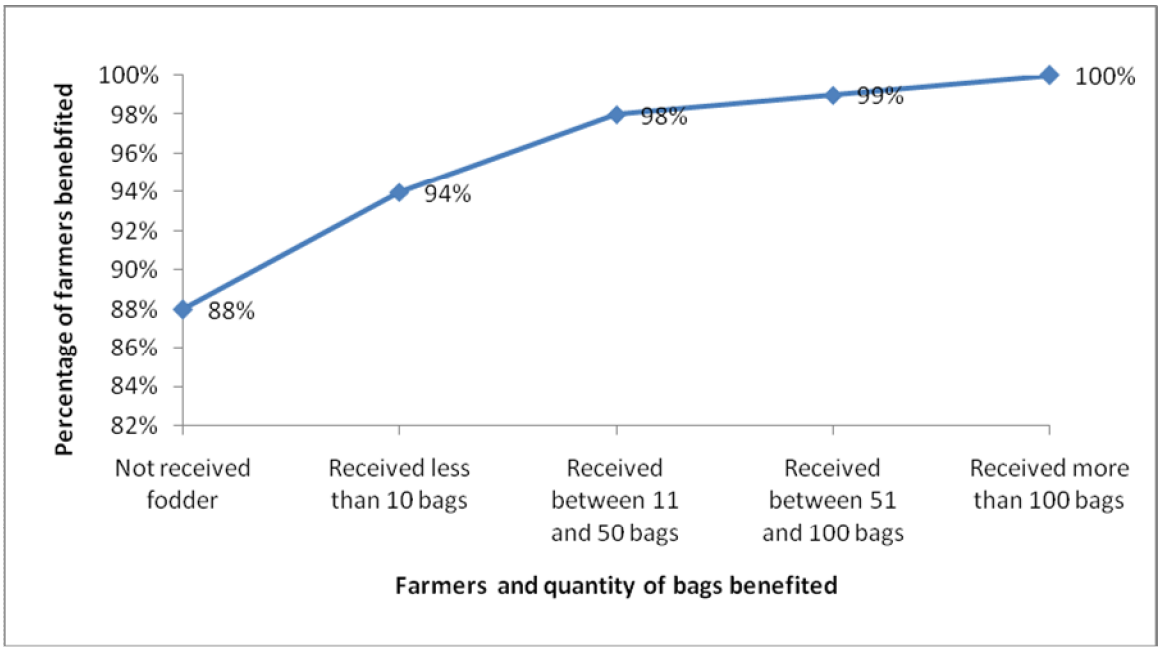

Figure 4.22: Cumulative distribution of bought fodder during drought relief scheme 2007/08

Table 4.7 and figure 4.22 indicated that eighty eight percent of 875 farmers applied for fodder did not received any bag of fodder received by the municipality. Only 12% of the farmers applied for fodder in the municipality received fodder. Six percent of the farmers received less ten bags per farmers. Four percent received fodder amounting between more than 10 bags and 50 bags per farmers. Only 2% of the farmers received more than 50 bags of fodder.

TABLE 4.6: RESPONSE IF FODDER ENOUGH FOR LIVESTOCK

YES	3%
NO	97%
Grand Total	(249) 100%

Ninety seven percent (97%) of the farmers indicated that the department of agriculture gave them insufficient fodder to the livestock farmers.

TABLE 4.7: RESPONSE IF DISTRIBUTION OF FODDER DONE FAIRLY

YES	1%
NO	99%
Grand Total	100%

Ninety nine percent (99%) of the farmers responded that the distribution of fodder was not done fairly. The records indicated that each farmer benefited more than one delivery for fodder. This was indication of poor management of records for those who benefited from the fodder drought relief scheme.

Both officials and farmers at local municipality and service centres were capacitated of implementation of fodder drought relief scheme for the equitable and fair distribution of fodder among the vulnerable farmers according to their livestock.

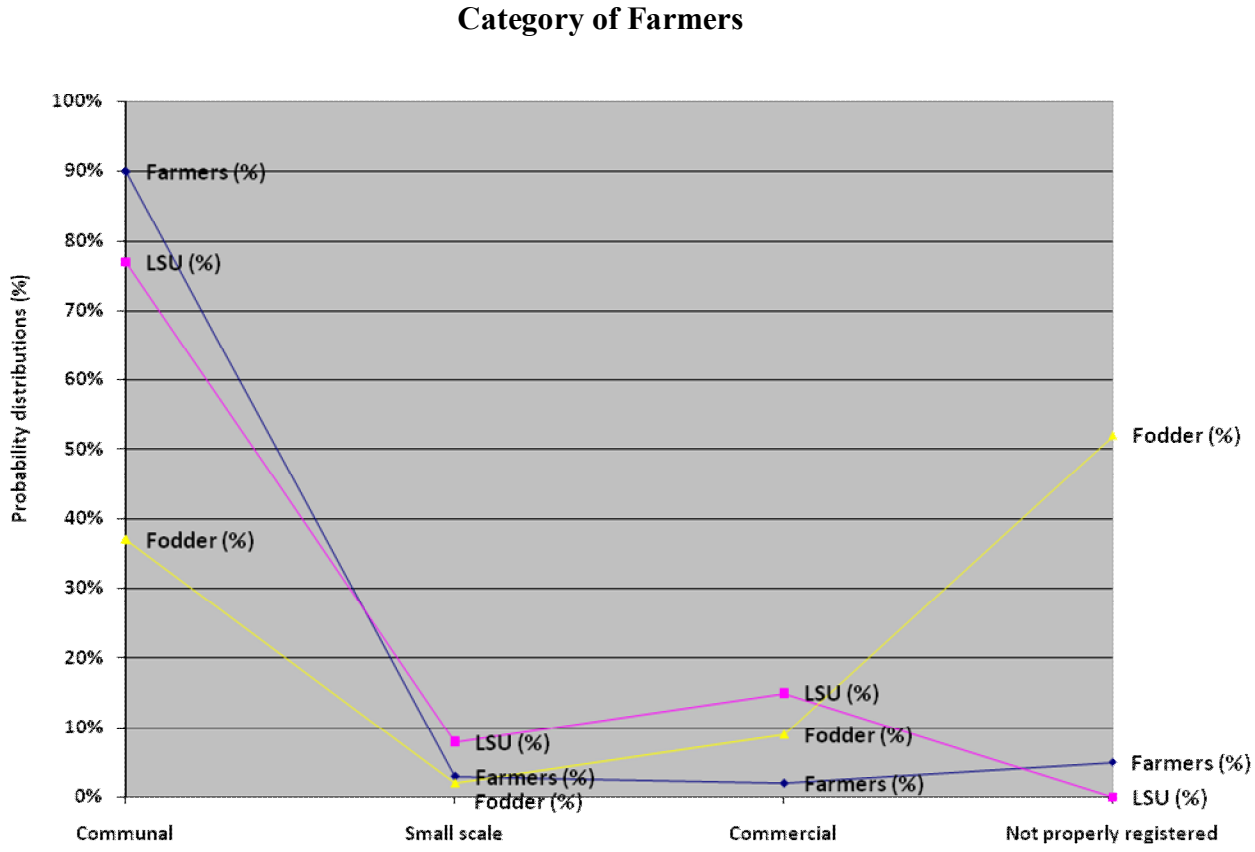

Figure 4.23: Categories of types of farmers, LSU and fodder allocation per number

According to Figure 4.23, 90% of the respondents were communal farmers. They owned 71% of LSU and shared 37% of 3 498 of the fodder allocated to the municipality. Ten per cent of them were small-scale, commercial and not properly registered farmers and they received 63% of the

fodder. Five per cent were not properly registered farmers, without indicating the number of LSU who owned and shared 52% of 3 498 bags of the fodder allocated to the municipality.

TABLE 4.8: FODDER DELIVERY AND THE DISTRIBUTION AT DEPOTS FOR 2007/8

	No of Farmers	No of LSU	Percentage of Farmers	Mean	Fodder (40kg Bags)	Percentage	Mean
Communal	787	6988	77%	9	1288	37%	2
Small scale	22	756	8%	36	80	2%	4
Commercial	18	1343	15%	71	320	9%	17
Not properly registered but benefited	48	0	0%	0	1810	52%	38
Total	875	9087	100%	10	3498	100%	4

Table 4.8 indicates that each farmer had on average ten LSU and he or she was supposed to receive four bags of fodder. The group means were as follows: for communal farming it was nine LSU per farmer who would receive two per farmer; for small scale farming was 36 LSU per farmer and would receive four per farmer; for commercial farming was 71 LSU per farmer and would receive 17 per farmer; for not properly registered farmers was nil LSU per farmer and would receive nil per farmer.

The actual distribution per sub-groups were as follows: communal farming received 37% of the 3 498 bags, small-scale farming received two per cent of the total bags, commercial farming received nine per cent of the total bags, and not properly registered farmers received 37% of the total bags. The correlation efficiency of 0.511 indicated the positive relationship between number of livestock and fodder.

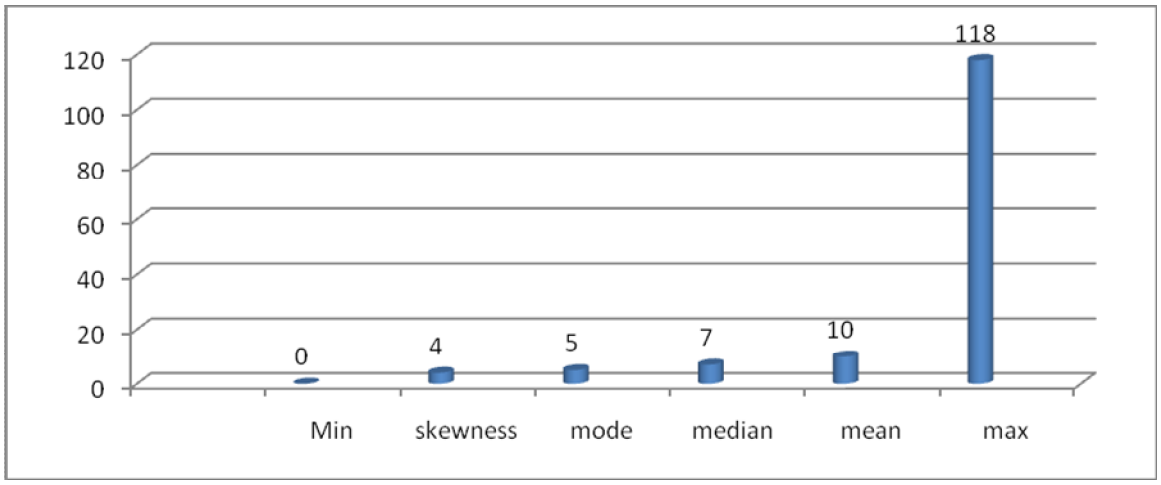

Figure 4:24: Third measure of central tendency from mean for livestock farmers

The skewness of distribution of LSU for livestock farmers were 3.695 showing the degree of asymmetrical distribution around the mean. There was negative skewness for the mean showed that many farmers owned less than the average number of 10 LSU.

The mode of five in the livestock numbers indicated that most registered farmers owned five LSU. Median of seven means 50% more registered farmers owned seven or less LSU. The minimum number of nil LSU indicated livestock farmers who benefited from the scheme without records of the livestock numbers, were not properly registered the maximum value was 118 LSU.

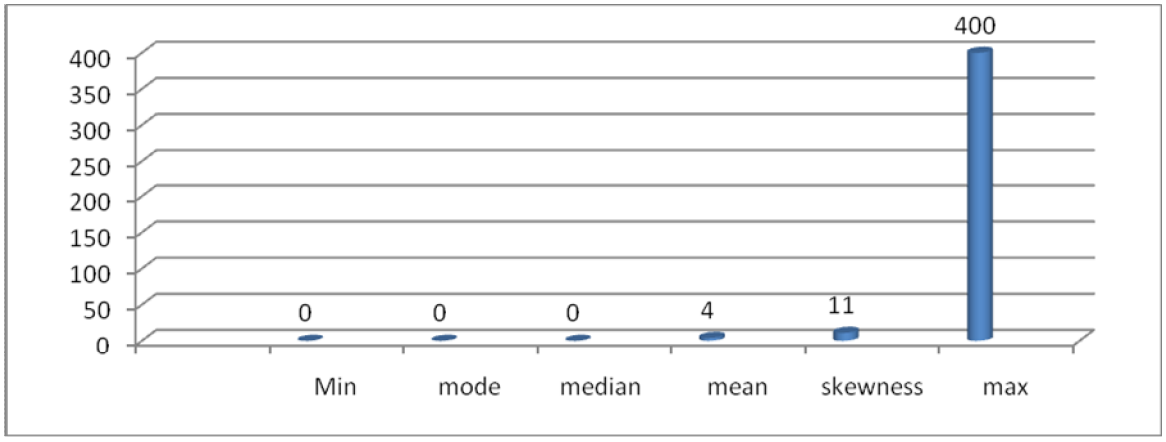

Figure 4:25: Third measure of central tendency from mean for fodder distribution

The skewness of distribution of fodder to livestock farmers were 11.367 showing the degree of asymmetrical distribution around the mean. There was positive skewness from the mean. The mode of nil in fodder distribution referred to many registered farmers who did not receive fodder during drought. Median of zero means 50% or more registered farmers did not receive assistance in the form of fodder. Each farmer received fodder to the maximum amount of 400 bags at Moletji service centre while other farmers shared only 100 bags of the delivered fodder.

4.7 Transport from depot to farmer's home

The distance from the depot and the selling points of the fodder determined the vulnerability of the communal farmers to receive drought relief scheme information in time, and the cost of transporting the fodder to their homes. Farmers were responsible for paying transport to collect fodder from the depot to their homes. That was the reason why the National Department Agriculture subsidized communal farmers 90% of transport cost of the fodder from the supplierôs place to the depot. The further the distance from the depot meant that the farmers would be more vulnerable to the costs of transport for transporting fodder to their places.

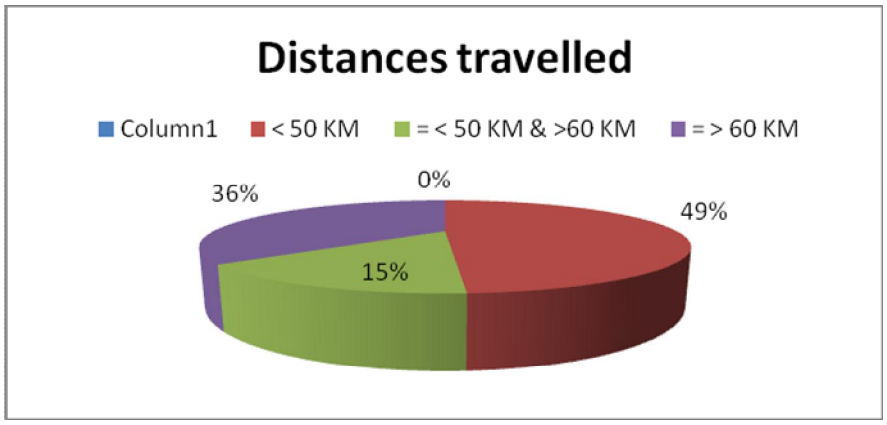

Figure 4.26: Distances travelled by farmers to Syferkuil depot

Forty-nine percent of the respondents were farmers who travelled less than 60 km to buy and collect fodder from Syferkuil depot, while 51% of them travelled more than 60 km to collect fodder from the depots. The distance to the depots and selling points determined the costs

involved in collecting fodder from the depots to the farmerôs premises. The further the distance referred to, the higher the transport costs.

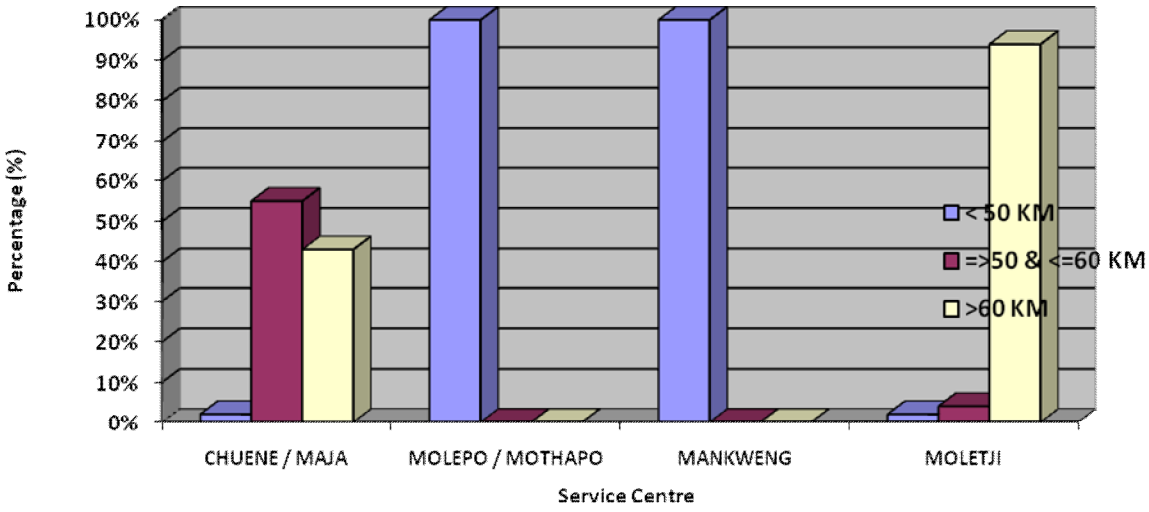

Figure 4.27: Distances travelled to Syferkuil depot arranged by service centres

All farmers in Molepo/Mothapo and Mankweng travelled less than 50 km to collect fodder at Syferkuil depot while other service centres travelled more than 50 km to collect fodder from the main depot. Ninety-four percent of the Moletji farmers and 43% of farmers from Chuene/Maja farmers travelled more than 60 km to collect their fodder from the Syferkuil depot. The distances travelled by farmers from Moletji and Chuene/Maja to buy and collect fodder at central depot Syferkuil were too far and caused farmers to pay for total cost of fodder.

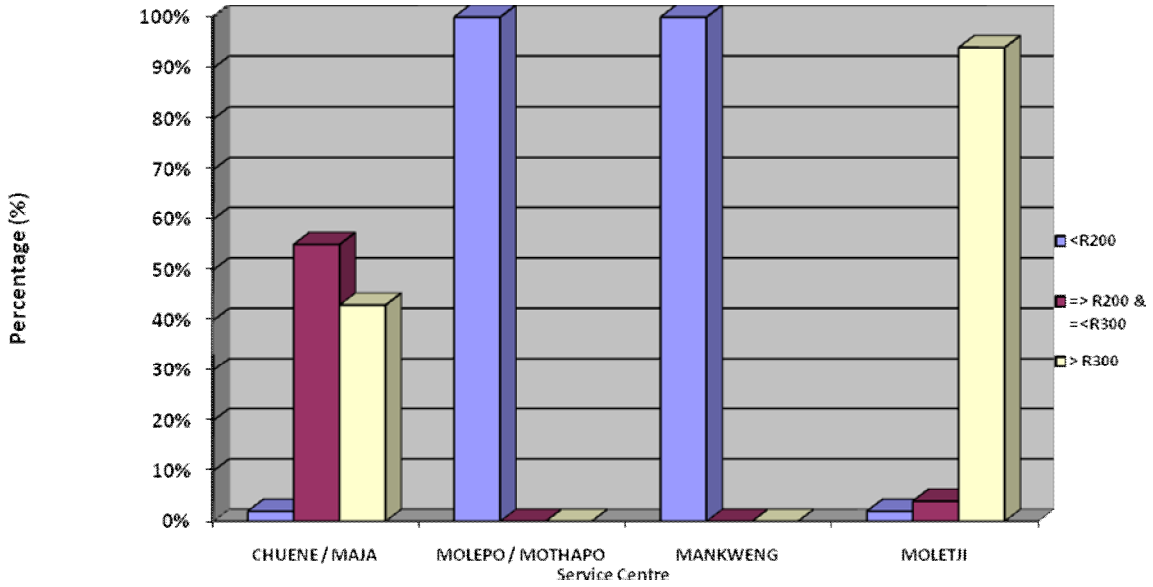

Figure 4.28: Costs of one tonne vehicle to collect fodder from service centres to Syferkuil depot

Fifty-five percent of Chuene /Maja farmers paid the amount ranging between R200.00 and R300.00 for the cost of transporting fodder from Syferkuil to their homes. Forty-three per cent of Chuene/Maja farmers and 94% of Moletji farmers paid more than R300.00 to collect ten bags from Syferkuil depot to their homes. Farmers at Chuene/Maja and Moletji were more vulnerable to the costs of transporting fodder from the depot to their homes. The costs of transport were aggravated by the use of one tonne vehicles to carry fodder from depots to the farms instead of using big trucks as bulk transport system where they grouped and shared the cost of transport.

Almost 100% of respondents from Molepo/Mothapo and Mankweng paid less than R200 to collect fodder from Syferkuil depot while 94% of respondents from Moletji and 43% from Chuene/Maja paid more than R300 to collect ten bags of fodder from Syferkuil depot.

4.8 Conclusion

The dissemination of information to farmers on early warning information, on registration to participate in the drought relief scheme and the availability of fodder came very late and left a

short space of time. The officials of the Department of Agriculture at local municipality registered the farmers when fodder was ordered to avoid confrontation if the scheme was disapproved.

The storing fodder at the tribal depots in Moletji and Maja/Chuene, were at high risks of product and cash theft from the sales depots. This led to the closure of Maja/Chuene and Moletji depots and left Syferkuil depot. The closure of Maja/Moletji depot worsened the situation for the poorer and old livestock farmers to buy and collect fodder at Syferkuil depot.

Officials at the municipality and service centres were informed of the process of registration when fodder was already ordered. Some farmers received the information of registration to participate in drought fodder relief scheme when fodder was available to avoid confrontation if scheme is disapproved.

The quantity of fodder delivered to the Polokwane municipality was not enough for the total livestock of farmers affected by drought disaster. The quantities demanded were not properly quantified because officials and farmers from the Polokwane Municipality were not part of advisory committee for drought risk and response management plans.

The two fodder selling points at Mankweng agricultural office and State VET office ended up with department sold more fodder than they received and this was worsened by some who bought and left their fodder uncollected in a store room for a long time due transport problems. Syferkuil depot is too far for the farmers in Moletji and Chuene/Maja service centres to buy and collect fodder.

The transport costs were high for the farmers at Moletji and Chuene/Maja service centre to buy fodder from Syferkuil. Moletji and Chuene/Maja depots were closed due products and financial safety of selling and travelling with money for long distance security officers.

The sold and uncollected fodder in the depot complicated the management of the fodder sales. The communal farmers did not adherence to disaster risk reduction strategies such selling part of

their livestock to others and put money for future use and / bought fodder for remaining cattle. The next chapter focuses on the possible solutions to the challenges experienced during presentation and analysis of data collected.

CHAPTER 5

RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

This chapter compared the practices of the implementation of fodder drought relief in Polokwane Municipality to the drought legislations, policies and frameworks of international, regional, national and local levels in order to improve the implementation process of the fodder drought relief scheme. The best practices and best legal framework were recommended, if suitable, for the country, province and municipality. The key issues to be addressed were legal and regulatory, institutional and structural, stakeholder participation, capacities for drought disaster risk reduction and financial resources for drought disaster risk reduction.

5.2 Legal and regulatory framework

The strategic documents such as Disaster Management Act (South Africa. 2002), Disaster Management Framework, governances and policies, overarching strategy and disaster management strategy should be made available and accessible to all institutional structures and their technical staff.

The operational documents are Drought Disaster Management Plan, National Drought Management Framework and Provincial drought disaster implementation plan which are the legal and regulatory frameworks that create an enabling environment for drought disaster risk management. The tactical documents such as plans of day to day activities and standard operating procedures should also be available and accessible to all stakeholders and their technical advisory teams. They also determine legal rights and duties of the citizens and departmental staff and other sectors in giving them protection.

Figure 4.8 and 4.9 indicated the types of disaster risk management documents and forms which were kept at municipal and service centre offices. The only documents found at their disposal

were Limpopo Provincial Drought Implementation Plan and database of farmers who applied and benefited for the fodder drought relief scheme. All relevant documents regarding drought risk management should be made available and accessible to all stakeholders in all districts, municipalities and service centres.

5.3 Institutional frameworks and structures

Figure 1.2 indicated that the institutional framework for drought disaster management of the Department of Agriculture, as a national state organ to the Limpopo Province, was Limpopo Department of agriculture at provincial level. From the districts to the municipalities and the service centre levels the structures operated temporarily when there were drought crisis management only. The other institutional frameworks were Limpopo Provincial Disaster Management Centre, Capricorn District Management Centre and Polokwane Municipality Disaster Management Centre, Polokwane Municipality IDP structures, Polokwane Municipality Ward structures and volunteers. Disaster advisory forums were formed from each institutional framework to deal with disasters occurring or threatening to occur in the province.

The forums for the stakeholder participation and the technical advisory committees for planning and operations were established for the Provincial Disaster Management Advisory Forum, Capricorn District Management Advisory Forum and Polokwane Municipality Disaster Management Advisory Forum, Polokwane Integrated Development Plans (IDPs) structures, ward structures and volunteers. The farming communities and communal community members as volunteers in Polokwane Municipality from the village or ward level up to the Limpopo Provincial level were not represented on the above-mentioned forums.

Advisory forums give advice and recommendation on disaster-related issues and disaster risk management. They should be part of disaster risk management planning and coordination. They should be a part of the establishmentôs joint standards of practice and implement the response management system. They should gather critical information about the municipal capacity access resources and assist in public awareness, training and capacity building.

The Department of Agriculture was assigned the leading role in drought risk management at all levels of the sphere of government from the national department up to service centres. The other stakeholders were the Department of Water Affairs, livestock farmers, tribal authorities, and local municipalities. The Department of Agriculture was responsible for horizontal and vertical coordination of all agricultural disasters with multiple stakeholders such as the Department of Water Affairs, private sectors and community organizations.

The structural development of Limpopo Department of Agriculture dealing with natural disaster management was functional only at provincial level and none at district, municipal and local levels. Figures 4.12 indicated that animal health, NRM and extension officials from local municipalities and service centres were assigned temporarily to deal with disaster crises management during disaster drought. The local agricultural service centre offices should provide resource mapping during planning and implantation of the drought fodder relief scheme. Municipal and tribal offices should provide storage facilities for fodder of farmers.

Vertical coordination of drought disaster management by the Department of Agriculture as the lead agency referred to three spheres whereby the bottom up approach should provide information on the quantity of farmers and number of livestock which required fodder from each depot, while top-down approach should inform lower levels on how to implement the approved drought fodder relief scheme.

Horizontal coordination of drought disaster management by the Department of Agriculture referred to the coordination of drought disaster with other departments. The Department of Agriculture coordinated the Department Water Affairs, Polokwane Local Municipality, Tribal offices, government agencies locally, farming communities and private sector dealing with disaster drought risk reduction activities and those whose commitment was to deal with them. There was no such structure at district and local municipality to deal with drought on a permanent basis.

The Department of Agriculture at district and local agricultural offices needs permanent structures to coordinate drought disaster risk management horizontally and vertically. Horizontal

coordination needs to be inter-departmental and intra-departmental whereby multi-skilled or multi-disciplinary resources such as natural resource management, extension service, animal health and animal production sectors and administration staff need to be coordinated.

Figures 4.12 indicated that 11% of farmers were informed by the livestock farmers associations. The service centres with farmers who benefitted from the information brought by farmers associations were Mankweng with 23% of its total farmers, Chuene / Maja with five per cent and Molepo / Mothapo with 14%. The farmers also benefited from the common transport organized for farmers for the implementation of the fodder drought relief scheme. The organized agricultural unions should be mobilized and formed in other service centres to deal with drought risk reduction activities. Tribal authorities and farming communities should be part of the organization for drought disaster risk management at district, local municipal and service centres.

5.4 Multi-stakeholder participation

The strengthening of strategic partnership and alliance should be build across the tribal authorities, Polokwane Local Municipality, private land owners and other land users during drought disaster risk management to reduce the negative impact of drought.

Partnership and alliance between crop production section and animal production encouraged crop production to plant pasture for livestock when anticipating drought conditions and ensure a market for their produce. Tribal authorities should be involved in planning the depots and reserved grazing camp as the owner of land would ensure that partnerships were based on local community interests. As indicated in Figure 1.2 the tribal authorities should be stakeholders in drought planning, drought vulnerability assessment, information and warning systems, drought relief preparedness and drought resource audit.

The Department of Agriculture at all levels should stimulate multi-disciplinary and inter-sectoral partnerships and networks whereby natural resource management, extension service, animal health and animal production sectors met and shared information regarding drought disaster risk reduction. Figure 1.2 indicated that the officials from different sectors such as the Department of

Agriculture, livestock farmers associations or representatives, the tribal authorities, Polokwane local municipality, private land owners and other land users should meet and strengthen a multi-sectoral platform for drought disaster reduction, coordination of policy and action and maintain once-off dialogue. It is possible if there is permanent staff specializing in drought risk management process.

Figures 4.5 and 4.6 stated the level of education of livestock farmers in the community who participated in disaster risk reduction, decision-making, policy setting, planning and implementation during disasters. Figure 4.12 indicated that 53% of officials who implemented the fodder drought relief scheme had not received sufficient education on the drought risk management, and they should be empowered to deal with registration processes of fodder to forward the request for fodder to the municipality offices.

Limpopo Provincial office used emails to inform districts and municipalities about drought risk management activities such as the implementation of the fodder drought relief scheme. The information disseminated from the Province to the district and always reached the municipality very late. The Polokwane Local Municipality had telephone and fax lines that were no longer used by District and Provincial offices due to an email system. Service centres had neither telephone lines nor fax numbers to receive or send information to and from service centres. Provincial structure should facilitate the establishment of installation technology infrastructure at both municipal offices and its service centres. Such email systems and colour printers for the officials would enable them to access the new technology and disseminate updated information to farmers to improve communication of disaster drought risk management.

The local farmers and officials were not part of policy setting, planning, disaster risk reduction strategies and implementation of the drought fodder relief scheme. Livestock farmers, other land users such as dry land farmers and local authorities should be part of drought disaster risk reduction planning. Tribal authorities should provide storage facilities for fodder at offices and that would reduce the costs of transporting fodder from the Syferkuil depot to farmersô homes. The shut down depots at Chuene/Maja and Moletji service centres could have been avoided if livestock farmers and tribal authorities had been part of the decision-making process of the

closed depots because they provided security for fodder. Farmers, local authorities and the local agricultural office should form part of the planning and implementation process of a drought relief scheme.

Livestock farmers and local officials should be part of integrated resource mobilization for drought risk management by proving information on number of farmers and livestock affected by drought and quantity demanded to reduce the impact and to get resources locally. Livestock farmers and local agricultural officers should be part of the processes of drought risk assessment, drought monitoring, disaster drought risk preparedness, registration of farmersô drought assistance, and the implementation of a drought relief scheme.

The farmersô registration process should be decentralized at local offices whereby officials and farmers at service centres could handle the process and keep copies of records for their applicants, and forward the original copies to municipal offices for integration. Distribution of fodder should be decentralized to local service centre offices. Agricultural officials at service centres and farmersô associations should be given the responsibility to own the process. The issues of a closed depot could have been avoided if farmers and local authorities had been involved in the decision-making process of the closed depots. Administrators should be accompanied by police officers to service centres when selling fodder to farmers to minimize the risk of theft.

5.5 Capacities for drought disaster risk reduction

All stakeholders participating in drought disaster risk management and the technical advisory committee should be capacitated for disaster risk assessment, disaster risk reduction and response and recovery activities. They should also be capacitated on disaster risk analysis, disaster risk estimation, disaster risk evaluations, monitoring risk reduction initiative updates and to disseminate risk assessment information.

Both officials and farmers in Polokwane municipality were not of drought disaster risk management and technical advisory committee that prepared and implemented the disaster risk

management plans, projects and programmes. Table 4.4 indicated that 80% of the officials who were responsible for dissemination of drought risk management were part time employees. They received late information to be disseminated. Figure 4.19 indicated that 57% of officials implementing fodder drought relief were technical staff while Figure 4.20 indicated that they received insufficient education regarding the implementation of drought risk management.

Table 4.4 indicated 83% local farmers who participated in drought disaster risk management and technical advisory committee received late information. Although Figure 4.17 indicated that 49% of the farmers adopted drought risk management activities the information reached the farmers very late. They should be capacitated on dissemination of early warning systems, assessment, classification, declaration and review of a disaster as part of integrated response.

Figure 4.20 indicated that 53% of technical officers should be part of a technical advisory committee that needed to be capacitated in accurate record keeping for disaster risk management activities, disaster risk reduction and contingency plans. Plans for specific projects, minutes, reports, memorandums and correspondence should be established and maintained. Technical advisory committees and disaster management advisor forums should be capacitated to keep comprehensive records of units of volunteers including their skill levels and capabilities and the records should be maintained.

Figures 4.4 and 4.5 indicated the farmersô levels of education that should be part of disaster management advisory forumsô directory of names. Community participation structures and contact details of the participants should be established and maintained. The technical advisory committee and disaster management advisory forum should be capacitated to keep records of performance measurement and monitoring of disaster management centres where primary entities of disaster risk management responsibilities were kept.

The government officials and policy makers, communities, volunteers, trainers and facilitators should attend trainings through workshops, short courses, seminars and conference types.

The provincial department of agriculture should organize and plan awareness programmes that would promote the culture of risk avoidance, targeting communities, officials, politicians and other stakeholders through *imbizo* (mass meeting), media and conferences.

Livestock farmers and local officials should be trained formally and informally on the institutional arrangements available to manage drought, methods of assessing drought, strategies to reduce drought impact and programmes and activities implemented where drought was declared as disaster.

Strengthen the capacities of all types of civil society to take part in drought disaster reduction and multi-stakeholder dialogue and action and to hold others to account through processes of participation and empowerment. The farmers and officials should be capacitated on the improved knowledge of the patterns and causes of drought disaster risk and methods of analysis in all settings.

The training of livestock farmers and local officials on the usage of emails and cell phones should be used to improve knowledge of disaster risk management through widespread exchange of good practices and lessons learned, and the application of effective drought relief frameworks for planning, monitoring and evaluation.

The livestock farmers and local agricultural officials should be capacitated to integrate drought contingency and operational plans as part of drought disaster management. The livestock farmers should be trained and made aware to register when the need for fodder arises. That would serve to guide the quantity demanded before approval of the drought fodder scheme. Both farmers and officials should be capacitated on drought disaster management and disaster reporting.

5.6 Financial resources for disaster risk reduction

The national and provincial department of Agriculture should provide funding for institutional arrangements in communal areas such as storage facilities for fodder and for the establishment of

the organizational structures dealing with disaster risk management activities in the district offices, municipality and local service centre offices.

The national and provincial department of agriculture should provide financial support for the activities of drought disaster risk management, such as drought risk assessment, drought monitoring and disaster drought risk preparedness planning in the normal budget of the running of the department.

Municipal officials should quantify the number of famers and livestock number that need to be assisted in time and forward the list for financial assistance to LDA in time. In terms of section 16 of PFMA the National Department of Agriculture as provincial department should set aside 1.2% of its total budget expenditure for response and recovery mechanisms. District municipality and local municipality should keep 0.6% of their own revenue for response and recovery from any disasters occurring in the area.

The national and provincial department of agriculture should provide enough funds for buying the fodder for livestock as per approved number of livestock to municipal depots based on requests made by district and local agricultural and municipal authorities. Livestock farmers should be encouraged to form or join existing livestock associations where they could hire large trucks which reduce costs of collecting fodder using small vehicles.

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Appendix 1

Drought relief scheme questionnaire design for the communal farmers

None disclosure consent and purpose of the research was clearly defined to the respondents.

Personal information

1 Gender

1	MALE	
2	FEMALE	

2 Cluster Name

1	Chuene /Maja	
2	Molepo / Mothapo	
3	Mankweng	
4	Moletji	
5	Others (Specify)	

3 Education information

1	Never attend school	
2	Primary school	
3	Metric	
4	College	
5	university	
6	Other(Specify)	

Registration and farmers

4 Did you register to participate in the scheme?

1	YES	
2	NO	

5 If yes when did you register?

1	Before fodder is available at depot	
2	When fodder is available at depot	

6 If no, how did you manage to get your fodder?

7 For how many animals did you register for this scheme?

1	Cattle	
2	Goats	
3	Sheep	

Distribution of fodder (Depot and farmers)

8 In which office did you pay for fodder?

1	State Vet	
2	Mankweng	
3	Others(Specify)	

9 Name of depot did you collect fodder?

1	Syferkuil	
2	Maja	
3	Moletji	

10 How far you are from the depot (KM)?

11 How much did you pay for transport to collect fodder from depot to your home (Rands)?

12 How many bags/ bales did you buy from the depot?

1	Bags	
2	Bales	

13 Was the fodder you received enough for your livestock?

1	YES	
2	NO	

14 Do you think distribution of fodder was done fairly?

1	YES	
2	NO	

15 If no, how do you suggest it should be done?

16 Who informed you about the registration to participate in the scheme and availability of fodder?

1	Animal health officer	
2	LED Officer	

3	Extension Officer	
4	Tribal office	
5	Others (Specify)	

17 How was the information communicated to you?

1	Community Radio Station	
2	Letters	
3	Telephone	
4	meetings	
5	Others (Specify)	

18 Do you receive Early Warning System information and monthly climatic advisory about drought?

1	YES	
2	NO	

19 If yes, what did you do to reduce the risk losing your livestock?

1	Sell to others and buy fodder for remaining	
2	Sell to others and put money for future use	
3	Just waiting for drought fodder	
4	Others (Specify)	

Thank you for taking part in study.

Appendix 2

Drought relief scheme questionnaire design for department of agriculture officials

None disclosure consent and purpose of the research was clearly defined to the respondent.

Personal Information

1 Gender

1	MALE	
2	FEMALE	

2 Cluster Name

1	Chuene /Maja	
2	Molepo / Mothapo	
3	Mankweng	
4	Moletji	
5	District / Provincial	
6	Others (Specify)	

Registration of farmers

3 Did you register farmers for drought relief benefits?

1	YES	
2	NO	

4 If yes when do you register them?

1	Before fodder is available at depot	
2	When fodder is available at depot	
3	Others (Specify)	

5 How many farmers and the total of livestock applied for the scheme?

1	Total Number of Farmers applied	
2	Total Number Cattle from the applicants Total Number Cattle from the applicants	

6 How do you mainly register them?

1	Manually	
2	Electronically	
3	Others (Specify)	

7 Do you keep records of applicants in your office?

1	YES	
2	NO	

8 Do farmers apply in time?

1	YES	
2	NO	

9 If no, how do you address farmers' late registrations?

Policy documents

10 Do you have any guide lines on the implementation of the scheme?

1	YES	
2	NO	

11 Have you been trained on these guide lines?

1	YES	
2	NO	

12 If no how did you implement the scheme?

13 If the answer is yes, was the training sufficient you to implement the scheme?

1	Very Sufficient	
2	Sufficient	
3	Insufficient	

Information and communication management

14 Do you keep any records of your operations?

1	YES	
2	NO	

15 What records related drought relief scheme do you keep?

16 Do you disseminate Early Warning System information and monthly climatic advisory about drought?

1	YES	
2	NO	

17 If yes, through which channel do you disseminate information to farmers?

1	Community Radio Station	
2	Letters	
3	Telephone	
4	meetings	
5	Others (Specify)	

18 What advice do you give to communal farmers to mitigate drought?

1	Sell to others and buy fodder for remaining	
2	Sell to others and put money for future use	
3	Just waiting for drought fodder	
4	Others (Specify)	

19 Was the fodder delivered on time?

1	YES	
2	NO	

20 How much fodder did each of depots below receive?

	Syferkuil	Maja	Moletji
Maize meal (bags)			
Pellets (bags)			
Lucerne (bales)			

21 How many farmers benefited from fodder distributed from depots?

22 How much fodder was distributed to farmers?

23 How did you arrive at the quota allocation per farmer?

1	Implementation manuals	
2	Diving fodder by the number of applicants	
3	Others (Specify)	

24 Was there enough fodder for farmers?

1	YES	
2	NO	

25 Who is responsible for paying transport costs from depot to farmer' home?

1	Farmers	
2	Government	
3	Others (Specify)	

26 What is the average distance a farmer has to travel to reach the depot?

27 In your opinion, was the scheme successfully implemented?

1	YES	
2	NO	

28 If no, what were the challenges?

29 How do you suggest the scheme should be improved?

Thank you for taking part in study.